CLUSTER

Trading Services

UNIT

Cleansing and Solid Waste

DEPARTMENT

Plant and Engineering

PROCUREMENT DOCUMENT

INFRASTRUCTURE

Documents are to be obtained, free of charge, in electronic format, from the National Treasury's eTenders website or the eThekwini Municipality's website.

Contract No: WS-7638

Contract Title: ZE 23150 Lovu Landfill Site: Construction of Cell 6 and Ancillary Works

Est. CIDB Grade/ Class: 8 CE

CLARIFICATION MEETING AND QUERIES

Clarification Meeting: Compulsory Clarification Meeting

Meeting Location, Date, Time: Administration Offices, Lovu Landfill Site, D982 Illovo Farm
On [03 August 2023] at [11:00]

Queries can be addressed to:
The Employer's Agent's Representative:
J Pass Pr. Eng; Wilson and Pass Incorporated
Tel: 082 463 1227 (m)
email: jon.pass@pixie.co.za
email queries to be submitted by 17 August 2023 and consolidated questions and answers to queries will be uploaded on 24 August 2023

TENDER SUBMISSION

Delivery Location: The Tender Box in the foyer of the Municipal Building
166 KE Masinga Road, Durban

Closing Date/ Time: Friday, 01 September 2023 at 11h00

FACSIMILE, eMAIL, or POSTED TENDERS WILL NOT BE ACCEPTED

Issued by:

ETHEKWINI MUNICIPALITY

Deputy Head: Plant and Engineering

Date of Issue: 28/07/2023

Document Version 24/02/2023(c)

FOR OFFICIAL USE ONLY

Tenderer Name:			VAT Registered: Yes No
	Price (excl)	VAT	Price (incl)
Submitted:	R	R	R
Corrected:	R	R	R

FOR OFFICIAL USE ONLY

Tenderer Name:			VAT Registered: Yes No
	Price (excl)	VAT	Price (incl)
Submitted:	R	R	R
Corrected:	R	R	R

INDEX to PROCUREMENT DOCUMENT

PART T1: TENDERING PROCEDURES

T1.1.1: TENDER NOTICE AND INVITATION TO TENDER

Tenders are hereby invited for the works to construct Cell 6 (approximately 43 000m^2 of landfill lining) and a new leachate collection pond (Leachate Pond 3 of approximately 5 000m^2 lining) requiring some 100 000m^3 of bulk earthworks, road layerworks and stormwater and leachate drainage as well as ancillary works at the DSW Lovu Landfill Site. The ancillary works are primarily concrete paving for all weather access and storage.

Subject	Description	Tender Data Ref.
Employer	The Employer is the eThekwini Municipality as represented by: **Logan Moodley** Deputy Head: **Plant and Engineering**	F.1.1.1
Tender Documents	Documents can only be obtained in electronic format, issued by the eThekwini Municipality. Documentation can be downloaded from the **National Treasury's eTenders website** or the **eThekwini Municipality's Website**. The entire document should be printed (on A4 paper) and suitably bound by the tenderer.	F.1.2
Eligibility	It is estimated that tenderers should have a CIDB contractor grading designation of **8 CE** (or higher). The CIDB provisions in relation to a Contractor's Potentially Emerging (PE) status do not apply.	F.2.1.1
Clarification Meeting	**Administration Offices, Lovu Landfill Site, D982 Illovo Farm** **On [03 August 2023] at [11:00]**	F.2.7
Seek Clarification	Queries relating to these documents are to be addressed to the Employer's Agent's Representative whose contact details are: **J Pass Pr. Eng; Wilson and Pass Incorporated** **Tel: 082 463 1227 (m)** **email: jon.pass@pixie.co.za** **email queries to be submitted by 17 August 2023 and consolidated questions and answers to queries will be uploaded on 24 August 2023**	F.2.8
Submitting a Tender Offer	Tender offers shall be delivered to: **The Tender Box in the foyer of the Municipal Building** **166 KE Masinga Road, Durban**	F.2.13
Closing Time	Tender offers shall be delivered on or before **Friday, 01 September 2023** at or before **11h00**.	F.2.15
Evaluation of Tender Offers	**Either the 80/20 or 90/10** Price Preference Point System, as specified in the PPPFA Regulations 2022 will be applied in the evaluation of tenders. Refer to Clause F.3.11 of the Tender Data for the **Specific Goal(S)** for the awarding of Preference Points, and other related evaluation requirements.	F.3.11

Requirements for sealing, addressing, delivery, opening and assessment of tenders are further stated in the Tender Data

PART T1: TENDERING PROCEDURES

T1.2: TENDER DATA

T1.2.1 STANDARD CONDITIONS OF TENDER

The conditions of tender are the Standard Conditions of Tender as contained in Annex F of the CIDB Standard for Uniformity in Construction Procurement (July 2015) as published in Government Gazette No 38960, Board Notice 136 of 2015 of 10 July 2015.

The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

T1.2.2 TENDER DATA

Each item of data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.

F.1: GENERAL

F.1.1 **The employer**: The Employer for this Contract is the eThekwini Municipality as represented by:
Deputy Head: **Plant and Engineering**

F.1.2 **Tender documents**: The Tender Documents issued by the Employer comprise:

1) This procurement document.

2) "General Conditions of Contract for Construction Works – 3rd Edition 2015" issued by the South African Institution of Civil Engineering (GCC 2015). This document is obtainable separately, and Tenderers shall obtain their own copies.

3) "City of Durban Technical Specifications" hereinafter referred to as the Standard Engineering Specifications. This document is obtainable separately, and Tenderers shall obtain their own copies of the applicable Sections.

4) Drawings, issued separately from this document, or bound in Section C3.4 (as an Annexure).

5) In addition, Tenderers are advised, in their own interest, to obtain their own copies of the following acts, regulations, and standards referred to in this document as they are essential for the Tenderer to get acquainted with the basics of construction management, the implementation of preferential construction procurement policies, and the participation of targeted enterprise and labour.
   - The Employer's current (as at advertising date) Supply Chain Management Policy.
   - The Preferential Procurement Policy Framework Act No 5 of 2000, and the Preferential Procurement Policy Framework Act Regulations (2022).
   - The Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the Construction Regulations (2014).
   - The Construction Industry Development Board Act No 38 of 2000 and the Regulations issued in terms of the Act (July 2013).
   - SANS 1921:2004 – Construction and Management Requirements for Works Contract, Parts 1-3.
   - Any other eThekwini Policy documents referenced in the Tender Documents.

Electronically downloaded documentation is obtainable from the National Treasury's **eTenders Website** or the **eThekwini Municipality's Website** at URLs:

- https://www.etenders.gov.za/
- https://www.durban.gov.za/pages/business/procurement

The entire downloaded document should be printed on white A4 paper (single-sided) and suitably bound by the tenderer.

F.1.4 Communication and employer's agent: The Employer's Agent's Representative is:

J Pass Pr. Eng; Wilson and Pass Incorporated
Tel: 082 463 1227 (m)
email: jon.pass@pixie.co.za
email queries to be submitted by 17 August 2023 and consolidated questions and answers to queries will be uploaded on 24 August 2023

The Tenderer's contact details, as indicated in the Contract Data: Clause C1.2.2.2 "Data to Be Provided by Contractor", shall be deemed as the only valid contact details for the Tenderer for use in communications between the Employer's Agent and the Tenderer.

F.2: TENDERER'S OBLIGATIONS

F.2.1.1 Eligibility: General

A Tenderer will not be eligible to submit a tender if:

(a) the Tenderer does not comply with the legal requirements as stated in the Employer's current SCM Policy.

(b) the Tenderer cannot provide proof that he is in good standing with respect to duties, taxes, levies and contributions required in terms of legislation applicable to the work in the contract.

(c) In the event of a Compulsory Clarification Meeting:
  i) the Tenderer fails to attend the Compulsory Clarification Meeting.
  ii) the Tenderer fails to have form "Certificate of Attendance at Clarification Meeting / Site Inspection" (in T2.2) signed by the Employer's Agent or his representative.

(d) in the case of JV submissions, two or more JV entities have common directors / shareholders or common entities tendering for the same works.

(e) at the time of closing of tenders, the Tenderer is not registered on the National Treasury Central Supplier Database (CSD) as a service provider. In the case of a Joint Venture, this requirement will apply individually to each party in the Joint Venture.

(f) The tenderer has not submitted, with this tender, a valid Letter of Good Standing from the Compensation Commissioner as proof of being registered and in good standing with the compensation fund. Reference is to be made to Returnable Document T2.2.13.

(g) The tender fails to complete and sign the Declaration of Municipal Fees in T2.2: "Returnable Documents" and submits the required documentation. Reference is to be made to Returnable Document T2.2.12.

SCM Policy (Cl.14(4)) requires suppliers/ service providers/ contractors to be registered on the

eThekwini Municipality Central Supplier Database or be in a position to be so before the award.

In the event of the Tenderer not being registered on the eThekwini Municipality's Central Supplier Database, the tenderer must register on the internet at www.durban.gov.za by following these links:

- Business
- Supply Chain Management (SCM)
- Accredited Supplier and Contractor's Database.

The following are to be noted:

(a) The information for registration as in the possession of the eThekwini Municipality will apply.
(b) It is the Tenderer's responsibility to ensure that the details as submitted to the Municipality are correct.
(c) Tenderers are to register prior to the submission of tenders.

F.2.1.2 **Eligibility: CIDB**

Only those tenderers who are registered (as "Active") with the CIDB (at time of tender closing), in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a **CE** class of construction work, are eligible to have their tenders evaluated.

Joint ventures are eligible to submit tenders provided that:
(a) Every member of the joint venture is registered (as "Active") with the CIDB (at time of tender closing),
(b) The lead partner has a contractor grading designation in the **CE** class of construction work and has a grading designation of not lower than one level below the required grading designation, and
(c) The combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations (2013) is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **CE** class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

It should be noted that this contract is not part of a Targeted Development Programme (TDP). The CIDB provisions in relation to a Contractor's Potentially Emerging (PE) status do not apply.

F.2.2.2 **The cost of the tender documents:** Replace this paragraph with the following:

"Documents are to be obtained, free of charge, in electronic format, from the **National Treasury's eTenders website** or the **eThekwini Municipality's Website**. The entire electronically downloaded document should be printed on white A4 paper (single-sided) and suitably bound by the tenderer.

F.2.6 **Acknowledge addenda:** Add the following paragraphs to the clause:

"Addenda will be published, in electronic format, on the websites specified in F.1.2. Tenderers are to ensure that the eTenders website is consulted for any published addenda pertaining to this tender up to three days before the tender closing time as stated in the Tender Data."

"Acknowledgement of receipt of the addenda will be by the return of the relevant completed, dated, and signed portion of the addenda, to the physical or email address as specified on the addenda. Failure of the tenderer to comply with the requirements of the addenda may result in the tender submission being made non-responsive."

F.2.7 **Clarification meeting:**
Administration Offices, Lovu Landfill Site, D982 Illovo Farm
On [03 August 2023] at [11:00]
In the event of a Compulsory Clarification Meeting, Tenderers must sign the attendance register in the name of the tendering entity. The Tenderer's representative(s) at the clarification meeting must be able to clearly convey the discussions at the meeting to the person(s) responsible for compiling the entity's tender offer.

F.2.12 **Alternative tender offers**: No alternative tender offers will be considered.

F.2.13 **Submitting a tender offer**: Submissions must be submitted on official submission documentation issued (either in hard copy or in electronic format) by the eThekwini Municipality.

Identification details to be shown on each tender offer package are:
- Contract No. : **WS-7638**
- Contract Title : **ZE 23150 Lovu Landfill Site: Construction of Cell 6 and Ancillary Works**

The Employer's address for delivery of tender offers is:

The Tender Box in the foyer of the Municipal Building
166 KE Masinga Road, Durban

Tenderers are to include, with their paper ("hard copy") submission, a memory-stick containing an electronically scanned (300 dpi resolution) Public Document Format (PDF) copy of their complete bid submission. This PDF file should be named using the contract number and the Tenderer's name, eg. "**WS-7638 – Tenderers Name.PDF**". The memory-stick must be labelled with the Tenderer's name and securely fixed to the paper submission.

Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.

F.2.15 **Closing time**: The closing time for delivery of tender offers is:
- Date : **Friday, 01 September 2023**
- Time : **11h00**

F.2.16 **Tender offer validity**: The Tender Offer validity period is 120 Days from the closing date for submission of tenders.

F.2.20 **Submit securities, bonds, policies:** The tenderer is required to submit with his tender a letter of intent from an approved insurer undertaking to provide the Performance Bond to the format included in T2.2 of this procurement document.

F.2.23 **Certificates**: Refer to T2.1 for a listing of certificates that must be provided with the tender. All certificates must be valid at the time of tender closing.

Tenderers are to include, at the back of their tender submission document, a printout of the required documents/ certificates.

The Form of Offer (C1.1.1), Data to be provided by the Contractor (C1.2.2.2), and the Bill of Quantities (C2.2) are also required to be completed in full.

Tax Clearance
Reference is also to be made to returnable form T2.2.3: "Tax Compliance Status PIN/ Tax Clearance Certificate".

SARS has introduced a new Tax Compliance Status System. Tenderers must submit a **Tax Compliance Status PIN** (TCS PIN) instead of an original Tax Clearance Certificate. This TCS PIN can be used by third parties to certify the taxpayer's real-time compliance status. This TCS PIN is to be entered on Returnable Document T2.2.1: "Compulsory Enterprise Questionnaire". Separate Tax Clearance Certificates / TCS PINs are required for each entity in a Joint Venture.

Failure to comply will make the tender non-responsive.

Compensation Commissioner
Reference is also to be made to returnable form T2.2.13: "Eligibility: Registration with Compensation Commissioner".

The tenderer is to supply proof of being registered and in good standing with the compensation fund by submitting a valid **Letter of Good Standing** from the Compensation Commissioner.

Failure to comply will make the tender non-responsive.

Central Supplier Database (CSD)
Reference is also to be made to returnable form T2.2.14: "Eligibility: CSD Registration Report".

The entities (full) **CSD Registration Report**, obtained from the National Treasury Central Supplier Database, is to be included in the tender submission (https://secure.csd.gov.za).

Separate CSD Registration Reports are required for each entity in a Joint Venture.

CIDB Registration
Reference is also to be made to returnable form T2.2.15: "Eligibility: Verification of CIDB Registration and Status".

Registration with the CIDB must be reflected as "Active" at time of tender closing.

Tenderers are to include with their submission a printout of their **CIDB Registration**, obtained from the CIDB website (https://registers.cidb.org.za/PublicContractors/ContractorSearch).

The Joint Venture Grading Designation Calculator should be used when submitting as a Joint Venture (https://registers.cidb.org.za/PublicContractors/JVGradingDesignationCalc).

The date of obtaining the CIDB printout(s) is to be indicated on the printout.

F.3: THE EMPLOYER'S UNDERTAKINGS

F.3.1.1 **Respond to requests from the tenderer:** Replace the words "five working days" with "three working days".

F.3.2 **Issue addenda:** Add the following paragraph: "Addenda will be published, in electronic format, on the same platform(s) as the Tender Notification (refer to F.1.2).

F.3.4 **Opening of Tender Submissions:** Tenders will be opened immediately after the closing time for tenders. The public reading of tenders will take place in the SCM Boardroom, 6th Floor, Engineering Unit Building, 166 KE Masinga Road, Durban.

F.3.11 Evaluation of Tender Offers:

Eligibility

Tenders will be checked for compliance with the ELIGIBILITY requirements, as specified in T1.2.2 Clause F.2.1. Tenderers not in compliance will be deemed non-responsive.

Functionality

FUNCTIONALITY will be evaluated to determine the responsiveness of tenders received. The minimum score for FUNCTIONALITY is 60 points. Those tenders not achieving the minimum score will be deemed non-responsive.

The functionality Criteria, Sub-Criteria, Points per Criteria/ Sub-Criteria, Returnable Documentation and Schedules, Method of Evaluation, and Prompts for Judgement are as specified in T1.2.3.5: "Additional Conditions of Tender".

Preference Point System

The financial offer will be reduced to a comparative basis using the **Tender Assessment Schedule**.

The procedure for the evaluation of responsive tenders is **PRICE AND PREFERENCE** in accordance with the Employer's current SCM Policy, the Preferential Procurement Policy Framework Act (5 of 2000), and the Preferential Procurement Policy Framework Act Regulations (2022).

Price Points

It is unclear (at the time of advertising) which of the two preference point systems applies, either the **80/20 or 90/10** preference point system will apply, determined by the price offered by the lowest acceptable tender.

Preference Points

Reference is also to be made to T2.2.7: "MBD 6.1: Preference Points Claim".

The Preference Points (either 20 or 10) will be derived from points allocated/ claimed for **Specific Goals** as indicated in the table(s) below, according to the specified **Goal/ Category Weightings**.

- **Ownership Goal**
  Goal Weighting: 50%

  The tendering entity's **Percentage Ownership**, in terms of the **Ownership Category(s)** listed below, is to be used in the determination of the tenderer's claim for **Preference Points**.

Ownership Categories	Criteria	80/20	90/10
Race: Black (w1)	Equals 0%	n/a	0
	Between 0% and 51%	n/a	2
	Greater or equal to 51% and less than 100%	n/a	4
	Equals 100%	n/a	5
Gender: Female (w2)	Equals 0%	n/a	0
	Between 0% and 51%	n/a	2
	Greater or equal to 51% and less than 100%	n/a	4
	Equals 100%	n/a	5
Disabilities (w3)	Equals 0%	n/a	0
	Between 0% and 51%	n/a	0
	Greater or equal to 51% and less than 100%	n/a	0
	Equals 100%	n/a	0
	Maximum Goal Points:	n/a	10

The **Weightings** of the **Ownership Categories** will be:
- w1 = 50%, w2=50%, w3=0% (where: w1 + w2 + w3 = 100%)

Proof of claim as declared on MBD 6.1 (1 or more of the following will be used in verifying the tenderer's status)
- Companies and Intellectual Property Commission registration document (CIPC)
- CSD report.
- B-BBEE Certificate of the tendering entity.
- Consolidated BBBEE Certificate if the tendering entity is a Consortium, Joint Venture, or Trust (Issued by verification agency accredited by the South African Accreditation System).
- Agreement for a Consortium, Joint Venture, or Trust.

- **RDP Goal: The promotion of South African owned enterprises**
  Goal Weighting: 25%

  The tendering entity's **Address** (as stated on the National Treasury Central Supplier Database (CSD) or on the eThekwini Municipality Vendor Portal) is to be used in the determination of the tenderer's claim for **Preference Points** for this Specific Goal.

Location	80/20	90/10
Not in South Africa	n/a	0
South Africa	n/a	2.5
Kwa Zulu Natal	n/a	5
eThekwini Municipality	n/a	10
Maximum Goal Points:	n/a	10

Proof of claim as declared on MBD 6.1 (1 or more of the following will be used in verifying the tenderer's status)
- CSD report

- **RDP Goal: Creation of new jobs to address black youth unemployment**
  Goal Weighting: 25%

The tendering entity's **Commitment to Appointment or Actual Appointment**, in terms of the categories below, is to be used in the determination of the tenderer's claim for **Preference Points** for this Specific Goal.

Number of jobs created	**80/20**	**90/10**
0 – 49	n/a	2.5
50 – 100	n/a	5
Over 100	n/a	10
Maximum Goal Points:	n/a	10

Proof of claim as declared on MBD 6.1 (1 or more of the following will be used in verifying the tenderer's status)
- Commitment letter to appoint youth from local ward (for a year or more)
- Appointment letters signed by local councillor or chief (for a year or more)
- Consider other evidence etc Copies of IDs and proof of address in Ethekwini

F.3.13 **Acceptance of tender offer:** In addition to the requirements of Clause F.3.13 of the Standard Conditions of Tender, tender offers will only be accepted if:

(a) The tenderer submits a **valid Tax Clearance Certificate OR Tax Compliance Status PIN**, issued by the TCS System of the South African Revenue Services, or has made arrangements to meet outstanding tax obligations.
(b) The tenderer is **registered, and "Active", with the Construction Industry Development Board**, at time of tender closing, in an appropriate contractor grading designation.
(c) The tenderer or any of its directors/shareholders is n**ot listed on the Register of Tender Defaulters** in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector.
(d) The tenderer has not:
  - Abused the Employer's Supply Chain Management System; or
  - Failed to perform on any previous contract and has been given a written notice to this effect.
(e) The tenderer has completed the **Compulsory Enterprise Questionnaire** and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the Employer or potentially compromise the tender process.
(f) The tenderer is **registered and in good standing with the compensation fund or** with a **licensed compensation insurer**.
(g) The Employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the **necessary competencies and resources to carry out the work safely**.

The Municipality does not bind itself to accept the lowest or any tender. It reserves the right to accept the whole or any part of a tender to place orders. Bidders shall not bind the Municipality to any minimum quantity per order. The successful Tenderer (s) shall be bound to provide any quantities stipulated in the specification.

The municipality has a firm intention to proceed with the work, subject to funding being identified. Notwithstanding clause F.1.1.3 of the Standard Conditions of Tender, the municipality reserves the right to award or not award the tender based on the municipalities available budget.

F.3.15 **Complete adjudicator's contract:** Refer to the General Conditions of Contract and the Contract Data.

F.3.17 **Copies of contract:** The number of paper copies of the signed contract to be provided by the Employer is ONE (1).

Tenderers are to include, with their "hard copy" submission, a memory-stick containing an electronically scanned (300 dpi resolution) Public Document Format (PDF) copy of their complete bid submission. This PDF file should be named using the contract number and the Tenderer's name, eg. "**WS-7638 – Tenderers Name.PDF**". The memory-stick must be labelled with the Tenderer's name and securely fixed to the paper submission.

T1.2.3 ADDITIONAL CONDITIONS OF TENDER

T1.2.3.1 Appeals

In terms of Regulation 49 of the Municipal Supply Chain Management Regulations persons aggrieved by decisions or actions taken by the Municipality, may lodge an appeal within 14 days of the decision or action, in writing to the Municipality. All appeals (clearly setting out the reasons for the appeal) and queries with regard to the decision of award are to be directed to:

The City Manager
Attention Ms S. Pillay eMail: Simone.Pillay@durban.gov.za
P O Box 1394
DURBAN, 4000

T1.2.3.2 Prohibition on awards to persons in the service of the state

Clause 44 of the Supply Chain Management Regulations states that the Municipality or Municipal Entity may not make any award to a person:

(a) Who is in the service of the State;
(b) If that person is not a natural person, of which a director, manager, principal shareholder or stakeholder is a person in the service of the state; or
(c) Who is an advisor or consultant contracted with the municipality or a municipal entity.

Should a contract be awarded, and it is subsequently established that Clause 44 has been breached, the Employer shall have the right to terminate the contract with immediate effect.

T1.2.3.3 Code of Conduct and Local Labour

The Tenderers shall make themselves familiar with the requirements of the following policies that are available on web address: ftp://ftp.durban.gov.za/cesu/StdContractDocs/:

- Code of Conduct;
- The Use of CLOs and Local Labour.

T1.2.3.4 Targeted Procurement

Targeted Procurement provisions are not applicable to this tender.

T1.2.3.5 Functionality Specification

F.3.11.9 The value of W_2 is 100. The Functionality criteria (and sub criteria if applicable) and maximum score in respect of each of the criteria are as follows:

Functionality Criteria / Sub Criteria		**Maximum Points Score**
Tenderer's Experience		40
Experience of Key Staff	Contracts Manager	10
	Site agent	15
	Foreman	15
Preliminary Programme		10
Construction Methodology & Quality Control		10
	Maximum possible score for Functionality (M_s)	100

The minimum number of evaluation points for Functionality is **60**. Only those tenderers who achieve the minimum number of Functionality evaluation points (or greater) will be eligible to have their tenders further evaluated.

Functionality shall be scored by not less than three evaluators and the scores of each of the evaluators will be averaged, weighted and then totalled to obtain the final score for Functionality. Each evaluation criteria will be assessed in terms of six indicators and scores allocated according to the following table:

Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
0	20	40	60	80	100

Evaluation criteria will be adjudicated according to submissions made in accordance with the following schedules, which are found in Part T2.2: Returnable Schedules:

Functionality Criteria	Returnable Schedules
Tenderer's Experience	• Experience of Tenderer
Project Organogram and Experience of Key Staff	• Proposed Organization and Staffing • Key Personnel • CV's with Experience of Key Personnel
Preliminary Programme	• Preliminary Programme
Construction Methodology & Quality Control	• Construction Approach, • Methodology, and Quality Control • Schedule of Proposed Subcontractors • Plant and Equipment

Unless otherwise stated, evaluation criteria will be adjudicated with respect to the contract specific Scope of Work, as specified in Part C.3. In this regard the following definitions apply to the evaluation criteria prompts for judgement:

- "**successfully completed**" implies a project has been completed on time and to specification;
- "**similar nature**" implies projects that were of a value of at least 70% of this tender's value, and had a comparable Scope of Work in terms of technical requirements and operations;
- "**experience**" implies experience on projects of a similar nature;
- "**accredited degree / diploma**" implies a minimum 3 year qualification within the built environment, from a registered University or Institute of Technology.

Criterion: Tenderer's Experience Note: Projects of a similar nature that will be considered shall be one, or a combination of, **Landfill Lining Project** including the construction of geosynthetic liner layers for a landfill and **Bulk Earthworks Projects**.	
Level 0	No information provided; OR submission of no substance / irrelevant information provided
Level 1	To have successfully completed 1 project of a similar nature within the past 10 years.
Level 2	To have successfully completed 2 to 3 projects of a similar nature within the past 10 years.
Level 3	To have successfully completed 4 to 5 projects of a similar nature within the past 10 years.
Level 4	To have successfully completed 6 to 8 projects of a similar nature within the past 10 years.
Level 5	To have successfully completed 9 or more projects of a similar nature within the past 10 years.

Criterion: Project Organogram and Experience of Key Staff

Note1 : "experience" implies experience within the same role on projects of a similar nature with respect to the Scope of Works and relates to **landfill lining** and/or **bulk earthworks** projects

Note 2: "accredited degree/diploma" implies a minimum 3 year qualification within the built environment, from a registered University or University of Technology.

	CONTRACTS MANAGER	SITE AGENT	FOREMAN
Level 0	No information provided OR submission of no substance / irrelevant information provided OR less than 2 year's experience OR Relevant accredited diploma / degree and less than 1 year's experience.	No information provided OR submission of no substance / irrelevant information provided OR less than 2 year's experience. OR Relevant accredited diploma / degree and less than 1 year's experience.	No information provided OR submission of no substance / irrelevant information OR Less than 2 year's experience.
Level 1	Relevant accredited diploma / degree and minimum 1 year's experience.	Relevant accredited diploma / degree and minimum 1 year's experience.	Minimum 2 year's experience.
Level 2	Relevant accredited diploma / degree and minimum 2 year's experience.	Relevant accredited diploma / degree and minimum 2 year's experience.	Minimum 3 year's experience.
Level 3	Relevant accredited diploma / degree and minimum 4 year's experience.	Relevant accredited diploma / degree and minimum 4 year's experience.	Minimum 5 year's experience.
Level 4	Relevant accredited diploma / degree and minimum 7 year's experience.	Relevant accredited diploma / degree and minimum 7 year's experience.	Minimum 8 year's experience.
Level 5	Relevant accredited diploma / degree and minimum 9 year's experience.	Relevant accredited diploma / degree and minimum 9 year's experience.	Minimum 10 year's experience.

Criterion: Preliminary Programme

Level 0	No information provided OR submission of no substance / irrelevant information provided
Level 1	Programme does not cover all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and not in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion).
Level 2	Programme covering all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and is in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion).
Level 3	Programme covering all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and is in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion). **Plus**: Shows critical path with logical linking of tasks/activities
Level 4	Programme covering all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and is in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion). **Plus**: • Shows critical path with logical linking of tasks/activities, and • Detailed activity and resources breakdown. • Cashflow included
Level 5	Programme covering all the applicable individual activities which are in an acceptable sequence, with appropriate durations, and is in accordance with generally accepted construction practice, and is in line with Clause 1.1.1.14 of the Conditions of Contract (time for achieving Practical Completion). **Plus**: • Shows critical path with logical linking of tasks/activities, and • Detailed activity and resources breakdown. • Cashflow included • Detailed Plant and equipment resource breakdown

Criterion: Construction Methodology & Quality Control	
Level 0	No information provided; OR submission of no substance / irrelevant information provided
Level 1	The technical approach / methodology, plant and equipment is poor and gives no relevant information in satisfying the projects objectives Quality control statement is poor with no relevant information
Level 2	The technical approach and/or methodology is less than acceptable and unlikely to satisfy project objectives or requirements. Plant and equipment is unlikely to provide adequate protection of the works. Quality control statement is generic.
Level 3	Brief overview of a site-specific methodology which encompasses all programmed activities in appropriate order and includes staff, plant and equipment resources, including subcontractors if applicable, a brief description of preparatory work, construction processes including finishing works for each activity. Quality control statements are site specific with statements covering required sampling and testing requirements for the programmed activities.
Level 4	The methodology is specifically tailored to address specific project requirements. The methods and approach to managing risk etc. are specifically tailored to the critical characteristics of the project. The plant and equipment are specifically tailored to the project requirements and are sufficiently adaptable to accommodate changes that may be required during execution Quality control statements are site specific covering required sampling and testing for programmed activities including site specific quality control checklist for programmed activities
Level 5	Besides meeting the “above Level 4” rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has excellent knowledge of working in the projects environment and producing the required final product. Plant and equipment proposals and ownership/provision arrangements are most likely to ensure a satisfactory project outcome. Quality control statements are site specific covering required sampling and testing for all programmed activities including site specific quality control checklist for all programed activities

PART T2: RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS

T2.1.1 General

The Tender Submission Documentation must be submitted in its entirety. All forms must be properly completed as required.

The Tenderer is required to complete each and every Schedule and Form listed below to the best of their ability as the evaluation of tenders and the eventual contract will be based on the information provided by the Tenderer. Failure of a Tenderer to complete the Schedules and Forms to the satisfaction of the Employer will inevitably prejudice the tender and may lead to rejection on the grounds that the tender is non-responsive.

T2.1.2 Returnable Schedules, Forms and Certificates

Entity Specific

Eligibility

Technical or Functionality Evaluation

T2.2 RETURNABLE SCHEDULES, FORMS, AND CERTIFICATES

The returnable schedules, forms, and certificates, as listed in T2.1.2, can be found on pages 18 to 36.

NOTE

The **Form of Offer** (C1.1.1), The **Data to be Provided by Contractor** (C1.2.2.2), and the **Bill of Quantities** (C2.2) are also required to be completed by the tenderer.

T2.2.1 COMPULSORY ENTERPRISE QUESTIONNAIRE

Ref	Description	Complete or Circle Applicable
1.1	Name of enterprise	
1.2	Name of enterprise's representative	
1.3	ID Number of enterprise's representative	
1.4	Position enterprise's representative occupies in the enterprise	
1.5	National Treasury Central Supplier Database Registration number	**MAAA**
1.6	eThekwini Supplier Database: Reference number (PR), if any:	**PR**
1.7	VAT registration number, if any:	
1.8	CIDB registration number, if any:	
1.9	Department of Labour: Registration number	
1.10	Department of Labour: Letter of Good Standing Certificate number	

2.0 **Particulars of sole proprietors and partners in partnerships (attach separate pages if more than 4 partners)**

	Full Name	Identity No.	Personal income tax No. *
2.1			
2.2			
2.3			
2.4			

3.0 **Particulars of companies and close corporations**

3.1	Company registration number, if applicable:	
3.2	Close corporation number, if applicable:	
3.3	Tax Reference number, if any:	
3.4	South African Revenue Service: Tax Compliance Status PIN:	

4.0 **Record in the service of the state** (Insert on a separate page if necessary)

Indicate by marking the relevant boxes with a cross, if any sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently or has been within the last 12 months in the service of any of the following:

- ☐ a member of any municipal council
- ☐ a member of any provincial legislature
- ☐ an official of any municipality or municipal entity
- ☐ a member of an accounting authority of any national or provincial public entity
- ☐ a member of the board of directors of any municipal entity
- ☐ a member of the National Assembly or the National Council of Province
- ☐ an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999)
- ☐ an employee of Parliament or a provincial legislature

Name of sole proprietor, partner, director, manager, principal shareholder or stakeholder	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 mths

5.0 **Record of spouses, children and parents in the service of the state** (Insert on a separate page if necessary)

Indicate by marking the relevant boxes with a cross, if any spouse, child or parent of a sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently or has been within the last 12 months in the service of any of the following:

- ☐ a member of any municipal council
- ☐ a member of any provincial legislature
- ☐ an official of any municipality or municipal entity
- ☐ a member of an accounting authority of any national or provincial public entity
- ☐ a member of the board of directors of any municipal entity
- ☐ a member of the National Assembly or the National Council of Province
- ☐ an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999)
- ☐ an employee of Parliament or a provincial legislature

Name of spouse, child or parent	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 mths

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise:

i) authorizes the Employer to verify the tenderers tax clearance status from the South African Revenue Services that it is in order.

ii) confirms that the neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004.

iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption.

iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest.

v) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

NAME (Block Capitals): ..... **Date**

SIGNATURE: .....

T2.2.2 CERTIFICATE OF ATTENDANCE AT CLARIFICATION MEETING / SITE INSPECTION

Reference is to be made to Clauses F.2.1(c) and F.2.7 of the Tender Data.

This is to certify that:

(tenderer name): .....

of (address): .....

.....

.....

was represented by the person(s) named below at the Clarification Meeting held for all tenderers, the details of which are stated in the Tender Data (F.2.7).

I / We acknowledge that the purpose of the meeting was to acquaint myself / ourselves with the site of the works and / or matters incidental to doing the work specified in the tender documents in order for me / us to take account of everything necessary when compiling our rates and prices included in the tender.

Particulars of person(s) attending the meeting:

Name: ……..…… Name: ..... ……

Signature: ……..…….…. Signature: ..... ……

Capacity: ……. Capacity: ……..……..……

Attendance of the above person(s) at the meeting is confirmed by the Employer's Agent's Representative, namely:

Name: …….

Signature: ……

Date: ……..….

T2.2.3 TAX COMPLIANCE STATUS PIN / TAX CLEARANCE CERTIFICATE

Reference is to be made to Clauses F.2.23 and F.3.13(a) of the Tender Data.

SARS has introduced a new Tax Compliance Status System. Tenderers can submit a Tax Compliance Status PIN (TCS PIN) instead of an original Tax Clearance Certificate. This TCS PIN can be used by third parties to certify the taxpayer's real-time compliance status.

Separate Tax Clearance Certificates / TCS PINs are required for each entity in a Joint Venture.

The TCS PIN(s) are to be entered under item 3.4 on form **T2.1.2.1: Compulsory Enterprise Questionnaire**.

Tenderers are to include, at the back of their tender submission document, a printout of their Tax Compliance Status PIN (TCS PIN) OR an original Tax Clearance Certificate.

Failure to include the required document will make the tender submission non-responsive.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, ***and that the requested documentation has been included in the tender submission****.*

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------

T2.2.4 CONTRACTOR'S HEALTH AND SAFETY DECLARATION

If Functionality is applicable as part of tender evaluation, reference is to be made to Clause F3.11.9 of the of the Conditions of Tender.

Reference is to be made to Clauses F.2.1(e) and F.2.23 of the Tender Data.

In terms of Clause 5(1)(h) of the OHSA 1993 Construction Regulations 2014 (referred to as "the Regulations" hereafter), a Principal Contractor may only be appointed to perform construction work if the Client is satisfied that the Principal Contractor has the necessary competencies and resources to carry out the work safely in accordance with the Occupational Health and Safety Act No 85 of 1993 and the OHSA 1993 Construction Regulations 2014.

To that effect, a person duly authorised by the tenderer, must complete and sign the declaration hereafter in detail.

Declaration by Tenderer

1 I, the undersigned, hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act No 85 of 1993 (as amended by the Occupational Health and Safety Amendment Act No 181 of 1993), and the OHSA 1993 Construction Regulations 2014.

2 I hereby declare that my company has the competence and the necessary resources to safely carry out the construction work under this contract in compliance with the Construction Regulations and the Employer's Health and Safety Specifications.

3 I propose to achieve compliance with the Regulations by one of the following **(Tenderers are to Circle Applicable - Yes or No)**:

	Circle Applicable	
(a) From my own competent resources as detailed in 4(a) hereafter.	Yes	NO
(b) From my own resources still to be appointed or trained until competency is achieved, as detailed in 4(b) hereafter:	Yes	NO
(c) From outside sources by appointment of competent specialist Subcontractors as detailed in 4(c) hereafter:	YES	NO

4 Details of resources I propose:
(Note: Competent resources shall include safety personnel such as a construction supervisor and construction safety officer as defined in Regulation 8, and competent persons as defined in Regulations 9, 10, 11, 12, 13, 14, 16, 17, 20, 21, 22, 23(1), 24, 25, 26, 27, 28 and 29, as applicable).

(a) Details of the competent and qualified key persons from my company's own resources, who will form part of the contract team:

NAMES OF COMPETENT PERSONS	POSITIONS TO BE FILLED BY COMPETENT PERSONS

(b) Details of training of persons from my company's own resources (or to be hired) who still have to be trained to achieve the necessary competency:

(i) By whom will training be provided?	
(ii) When will training be undertaken?	
(iii) Positions to be filled by persons to be trained or hired:	

(c) Details of competent resources to be appointed as subcontractors if competent persons cannot be supplied from own company:

Name of proposed subcontractor:	
Qualifications or details of competency of the subcontractor:	

5 I, the undersigned, hereby undertake, if this tender is accepted, to provide, before commencement of the works under the contract, a suitable and sufficiently documented Health and Safety Plan in accordance with Regulation 7(1) of the Construction Regulations, which plan shall be subject to approval by the Client.

6 I, the undersigned, confirm that copies of this company's approved Health and Safety Plan, the Client's Safety Specifications as well as the OHSA 1993 Construction Regulations 2014 will be provided on site and will at all times be available for inspection by the Principal Contractor's personnel, the Client's personnel, the Employer's Agent, visitors, and officials and inspectors of the Department of Labour.

7 I, the undersigned, hereby confirm that adequate provision has been made in the tendered rates and prices in the Bill of Quantities to cover the cost of all resources, actions, training and all health and safety measures envisaged in the OHSA 1993 Construction Regulations 2014, and that I will be liable for any penalties that may be applied by the Client in terms of the said Regulations (Regulation 33) for failure on the Principal Contractor's part to comply with the provisions of the Act and the Regulations.

8 I, the undersigned, agree that failure to complete and execute this declaration to the satisfaction of the Client will mean that this company is unable to comply with the requirements of the OHSA 1993 Construction Regulations (2014) and accept that this tender will be prejudiced and may be rejected at the discretion of the Client.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.5 MBD 4: DECLARATION OF INTEREST

MSCM Regulations: "**in the service of the state**" means to be:

(a) a member of:
  (i) any municipal council.
  (ii) any provincial legislature.
  (iii) the national Assembly or the national Council of provinces.
(b) a member of the board of directors of any municipal enterprise.
(c) an official of any municipality or municipal enterprise.
(d) an employee of any national or provincial department, national or provincial public enterprise or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999).
(e) a member of the accounting authority of any national or provincial public enterprise.
(f) an employee of Parliament or a provincial legislature.

"**Shareholder**" means a person who owns shares in the company and is actively involved in the management of the company or business and exercises control over the company.

1 No bid will be accepted from persons **in the service of the state**[1].

2 Any person, having a kinship with persons **in the service of the state**, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to **persons in service of the state**, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority and/or take an oath declaring his/her interest.

3 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

3.1	Name of enterprise	Complete T2.1.2.1 Item 1.1
	Name of enterprise's representative	Complete T2.1.2.1 Item 1.2
3.2	ID Number of enterprise's representative	Complete T2.1.2.1 Item 1.3
3.3	Position enterprise's representative occupies in the enterprise	Complete T2.1.2.1 Item 1.4
3.4	Company Registration number	Complete T2.1.2.1 Item 3.1 or 3.2
3.5	Tax Reference number	Complete T2.1.2.1 Item 3.3
3.6	VAT registration number	Complete T2.1.2.1 Item 1.7

3.7 The names of all directors / trustees / shareholders / members / sole proprietors / partners in partnerships, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below. In the case of a joint venture, information in respect of each partnering enterprise must be completed and submitted.

		Circle Applicable	
3.8	Are you presently in the service of the state?	YES	NO
	If yes, furnish particulars: ……		
	……		
3.9	Have you been in the service of the state for the past twelve months?	YES	NO
	If yes, furnish particulars: ……		
	……		

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid?	YES	NO
If yes, furnish particulars:		
3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid?	YES	NO
If yes, furnish particulars:		
3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?	YES	NO
If yes, furnish particulars:		
3.13 Are any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?	YES	NO
If yes, furnish particulars:		
3.14 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract?	YES	NO
If yes, furnish particulars:		

4 The names of all directors / trustees / shareholders / members / sole proprietors / partners in partnerships, their individual identity numbers and state employee numbers must be indicated below. In the case of a joint venture, information in respect of each partnering enterprise must be completed and submitted

Full Name	Identity No.	State Employee No.	Personal income tax No.

Use additional pages if necessary

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.6 MBD 5: DECLARATION FOR PROCUREMENT ABOVE R10 MILLION
(ALL APPLICABLE TAXES INCLUDED)

For all procurement expected to exceed R10 million (all applicable taxes included), bidders must complete the following questionnaire.

		Circle Applicable	
1.0	Are you by law required to prepare annual financial statements for auditing?	YES	NO

1.1 **If YES, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years.**

2.0	Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days?	YES	NO

2.1 If NO, this serves to certify that the bidder has no undisputed commitments for municipal services towards any municipality for more than three months or other service provider in respect of which payment is overdue for more than 30 days.

2.2 If YES, provide particulars.

……

……

3.0	Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract?	YES	NO

3.1 If YES, provide particulars.

……

……

4.0	Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic?	YES	NO

4.1 If YES, provide particulars.

……

……

If required by 1.1 above, tenderers are to include, at the back of their tender submission document, a printout of their audited annual financial statements.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, ***and, if required, that the requested documentation has been included in the tender submission****.*

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------

T2.2.7 MBD 6.1: PREFERENCE POINTS CLAIM
In terms of THE PREFERENTIAL PROCUREMENT REGULATIONS (2022)

Reference is to be made to Clause F.3.11 of the Tender Data.

This preference form must form part of all tenders invited. It contains general information and serves as a claim form for preference points for specific goals.

NB: BEFORE COMPLETING THIS FORM, TENDERERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF THE TENDER AND PREFERENTIAL PROCUREMENT REGULATIONS, 2022

1.0 GENERAL CONDITIONS

1.1 The following preference point systems are applicable to invitations to tender:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included).
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 The applicable preference point system for this tender is the 90/10 preference point system.

1.2 Either the 80/20 or 90/10 preference point system will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the applicable system once tenders are received.

1.3 Preference Points for this tender shall be awarded for:

- **Price** and **Specific Goals**: Either 80 or 90 (price) and 20 or 10 (specific goals), in terms of 1.2 above.
- The total Preference Points, for Price and Specific Goals, is 100.

1.4 Failure on the part of the tenderer to submit the required proof or documentation, in terms of the requirements in the Conditions of Tender for claiming specific goal preference points, will be interpreted that preference points for specific goals are not claimed.

1.5 The Municipality reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard of preferences, in any manner required by the Municipality.

2.0 DEFINITIONS

2.1 "**tender**" means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation.

2.2 "**price**" means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts.

2.3 "**rand value**" means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes.

2.4 "**tender for income-generating contracts**" means a written offer in the form determined by Municipality in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the Municipality and a third party that produces revenue for the Municipality, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions.

2.5 "**the Act**" means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3.0 FORMULA FOR CALCULATION OF PREFERENCE PRICE POINTS

3.1 PROCUREMENT OF GOODS AND SERVICES

POINTS AWARDED FOR PRICE: A maximum of 80 or 90 points is allocated for price on the following basis:

90 / 10 Points System

$$Ps = 90\left(1 - \frac{Pt - Pmin}{Pmin}\right)$$

Where:
Ps = Points scored for price of tender under consideration
Pt = Price of tender under consideration
Pmin = Price of lowest acceptable tender

3.2 DISPOSAL OR LEASING OF STATE ASSETS AND INCOME GENERATING PROCUREMENT

POINTS AWARDED FOR PRICE: A maximum of 80 or 90 points is allocated for price on the following basis:

80 / 20 Points System

$$Ps = 80\left(1 + \frac{Pt - Pmax}{Pmax}\right)$$

OR

90 / 10 Points System

$$Ps = 90\left(1 + \frac{Pt - Pmax}{Pmax}\right)$$

Where:
Ps = Points scored for price of tender under consideration
Pt = Price of tender under consideration
Pmax = Price of highest acceptable tender

4.0 POINTS AWARDED FOR SPECIFIC GOALS

4.1 In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goal(s) stated in **Table 1** below, as supported by proof/ documentation stated in the **Conditions of Tender**:

4.2 In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of:

(a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system, or
(b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,

then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

TABLE 1: Specific Goals for the tender and maximum points for each goal are indicated per the table below.

Tenderers are to indicate their points claim for each of the Specific Goals in the shaded blocks.

The Specific Goals to be allocated points in terms of this tender	Maximum Number of points ALLOCATED (80/20 system)	Maximum Number of points ALLOCATED (90/10 system)	Number of points CLAIMED (80/20 system)	Number of points CLAIMED (90/10 system)
Ownership Goal: Race (black)	n/a	4	n/a	
Ownership Goal: Gender (female)	n/a	1	n/a	
Ownership Goal: Disabilities	n/a	0	n/a	
RDP Goal: The promotion of South African owned enterprises.	n/a	2.5	n/a	
RDP Goal: The Creation of new jobs to address black youth unemployment	n/a	2.5	n/a	
Total CLAIMED Points (20 or 10 Maximum)				

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, certify that the points claimed, based on the specific goals as specified in the tender, qualifies the tendering entity for the preference(s) shown.

I acknowledge that:

1) The information furnished is true and correct.

2) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form.

3) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct.

4) If the specific goals have been claimed or obtained on a fraudulent basis, or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have:

   (a) disqualify the person from the tendering process.
   (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct.
   (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation.
   (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
   (e) forward the matter for criminal prosecution, if deemed necessary.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------

T2.2.8 MBD 8: DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1.0 This Municipal Bidding Document must form part of all bids invited.

2.0 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

3.0 The bid of any bidder may be rejected if that bidder, or any of its directors have:

a) abused the municipal entity's supply chain management system or committed any improper conduct in relation to such system.
b) been convicted for fraud or corruption during the past five years.
c) wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years.
d) been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

4.0 In order to give effect to the above, the following questions must be completed and submitted with the bid.

		Circle Applicable	
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer / Authority of the institution that imposed the restriction after the audi alteram partem rule was applied.) The Database of Restricted Suppliers now resides on the National Treasury's website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.	YES	NO

4.1.1 If YES, provide particulars.

.....

.....

4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.	YES	NO

4.2.1 If YES, provide particulars.

.....

.....

4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	YES	NO

4.3.1 If YES, provide particulars.

.....

.....

4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	YES	NO

4.4.1 If YES, provide particulars.

.....

.....

4.5	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	YES	NO

4.5.1 If YES, provide particulars.

.....

.....

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

I accept that, in addition to cancellation of a contract, action may be taken against me should this declaration prove to be false.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.9 MBD 9: CERTIFICATE OF INDEPENDENT BID DETERMINATION

NOTES

[1] Includes price quotations, advertised competitive bids, limited bids and proposals.

[2] Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

[3] Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

1.0 This Municipal Bidding Document (MBD) must form part of all **bids**[1] invited.

2.0 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or **bid rigging**).[2] Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.

3.0 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:

a. take all reasonable steps to prevent such abuse;
b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

4.0 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of **bid rigging**.

5.0 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

\- -

(Bid Number and Description)

in response to the invitation for the bid made by:

\- -

(Name of Municipality / Municipal Entity)

do hereby make the following statements that I certify to be true and complete in every respect.

I certify, on behalf of:

\- -

(Name of Bidder)

that:

1. I have read and I understand the contents of this Certificate.

2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect.

3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;

4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;

5. For the purposes of this Certificate and the accompanying bid, I understand that the word “competitor” shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
   (a) has been requested to submit a bid in response to this bid invitation.
   (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience.
   (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder.

6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement, or arrangement with any competitor. However, communication between partners in a joint venture or consortium[3] will not be construed as collusive bidding.

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
   (a) prices.
   (b) geographical area where product or service will be rendered (market allocation).
   (c) methods, factors or formulas used to calculate prices.
   (d) the intention or decision to submit or not to submit, a bid.
   (e) the submission of a bid which does not meet the specifications and conditions of the bid.
   (f) bidding with the intention not to win the bid.

8. In addition, there have been no consultations, communications, agreements, or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.

9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------

T2.2.10 JOINT VENTURES AGREEMENTS

Joint Venture agreement and Power of Attorney Agreements to be attached here (if applicable).

T2.2.11 RECORD OF ADDENDA TO TENDER DOCUMENTS

I / We confirm that the following communications received from the Employer or his representative before the date of submission of this tender offer, amending the tender documents, have been taken into account in this tender offer.

ADD.No	DATE	TITLE OR DETAILS
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

It is also confirmed that the requirements, as stated on the Addenda, have been complied with.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------

T2.2.12 ELIGIBILITY: DECLARATION OF MUNICIPAL FEES

Reference is to be made to Clause F.2.1(f)(ii) of the Tender Data.

I, the undersigned, do hereby declare that the Municipal fees of:

.....

(full name of Company / Close Corporation / partnership / sole proprietary/Joint Venture)

(hereinafter referred to as the TENDERER) are, as at the date hereunder, fully paid or an Acknowledgement of Debt has been concluded with the Municipality to pay the said charges in instalments.

The following account details relate to property of the said TENDERER:

Account	**Account Number: to be completed by tenderer**
Consolidated Account	
Electricity	
Water	
Rates	
JSB Levies	
Other	

I acknowledge that should the aforesaid Municipal charges fall into arrears, the Municipality may take such remedial action as is required, including termination of any contract, and any payments due to the Contractor by the Municipality shall be first set off against such arrears.

- Where the tenderer's place of business or business interests are outside the jurisdiction of eThekwini municipality, a copy of the accounts/ agreements from the relevant municipality are to be provided.
- Where the tenderer's Municipal Accounts are part of their lease agreement, then a copy of the agreement, or an official letter to that effect, is to be provided.

Tenderers are to include, at the back of their tender submission document, a printout of the above account's and or agreements signed with the municipality.

Failure to include the required document will make the tender submission non-responsive.

*I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, **and that the requested documentation has been included in the tender submission**.*

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.13 ELIGIBILITY: REGISTRATION WITH COMPENSATION COMMISSIONER

Reference is to be made to Clause F.2.1(f)(i) of the Tender Data.

The Occupational Injuries and Diseases Act (130 of 1993 as amended) (the Act) refers. A summary of the pertinent Clauses are listed below. The act is to be referenced for the full text of the clauses.

Clause 80: Employer to register with commissioner and furnish him with particulars
The Act requires that an Employer carrying out business in the Republic to register with the Compensation Commissioner. Any person who fails to comply with the provisions of the this clause is guilty of an offence.

Clause 82: Employer to furnish returns of earnings
The Act requires an Employer to furnish the commissioner with a return showing:

- The amount of earnings paid by him to his employees.
- Any further information as may be prescribed or as the commissioner may require.

Any Employer who fails to comply with the provisions of the this clause is guilty of an offence.

Clause 86: Assessment to be paid by an employer to commissioner
The Act states that an Employer will receive notices of assessment from the commissioner. The Employer must pay the commissioner the assessment amount on the notices.

Clause 89: Mandators and contractors
The Act requires a contractor (a person with a contract with a mandator) to register as an Employer in accordance with the provisions of the Act and pay the necessary assessments. Failing registration or payment of assessments, the mandator is required to pay the assessments in respect of the employees of the contractor. The mandator is allowed to recover the assessment amounts paid from the contractor.

The Department of labour issues contractors with a **Letter of Good Standing** if the contractor has complied with the requirement(s) of the Act and is in "good standing" with the Compensation Fund. Employers can check the validity of such Letters of Good Standing on the internet (https://cfonline.labour.gov.za/VerifyLOGS).

Tenderers are to include, at the back of their tender submission document, a printout of their most recent Letter of Good Standing from the Department of Labour.

Failure to include the required document will make the tender submission non-responsive.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, ***and that the requested documentation has been included in the tender submission****.*

NAME (Block Capitals): ..... **Date**

SIGNATURE: .....

T2.2.14 ELIGIBILITY: CSD REGISTRATION REPORT

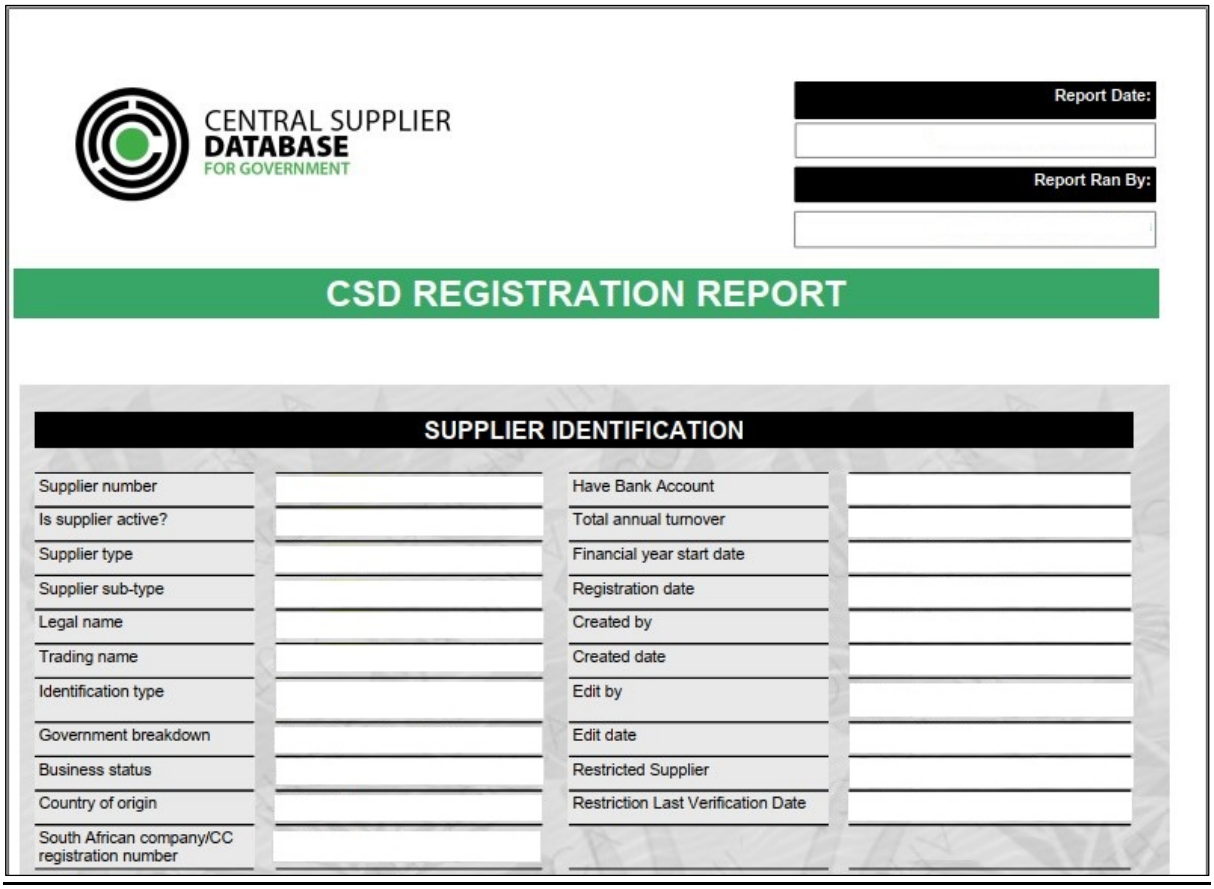
Reference is to be made to Clauses F.2.1(e) and F.2.23 of the Tender Data.

The Conditions of Tender, Clause F.2.1: Eligibility, requires a tenderer to be registered, at the time of tender closing, on the **National Treasury Central Supplier Database (CSD)** as a service provider.

CSD Registration Reports can be obtained from the National Treasury's CSD website at https://secure.csd.gov.za/Account/Login.

The date of obtaining the printout is to be indicated on the printout.

The following is an example of the beginning of the printout obtained from the above website.



CENTRAL SUPPLIER DATABASE FOR GOVERNMENT

Report Date:

Report Ran By:

CSD REGISTRATION REPORT

SUPPLIER IDENTIFICATION

Supplier number		Have Bank Account	
Is supplier active?		Total annual turnover	
Supplier type		Financial year start date	
Supplier sub-type		Registration date	
Legal name		Created by	
Trading name		Created date	
Identification type		Edit by	
Government breakdown		Edit date	
Business status		Restricted Supplier	
Country of origin		Restriction Last Verification Date	
South African company/CC registration number			

Tenderers are to include, at the back of their tender submission document, a printout of their (full) CSD Registration Report.

*I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, **and that the requested documentation has been included in the tender submission**.*

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------

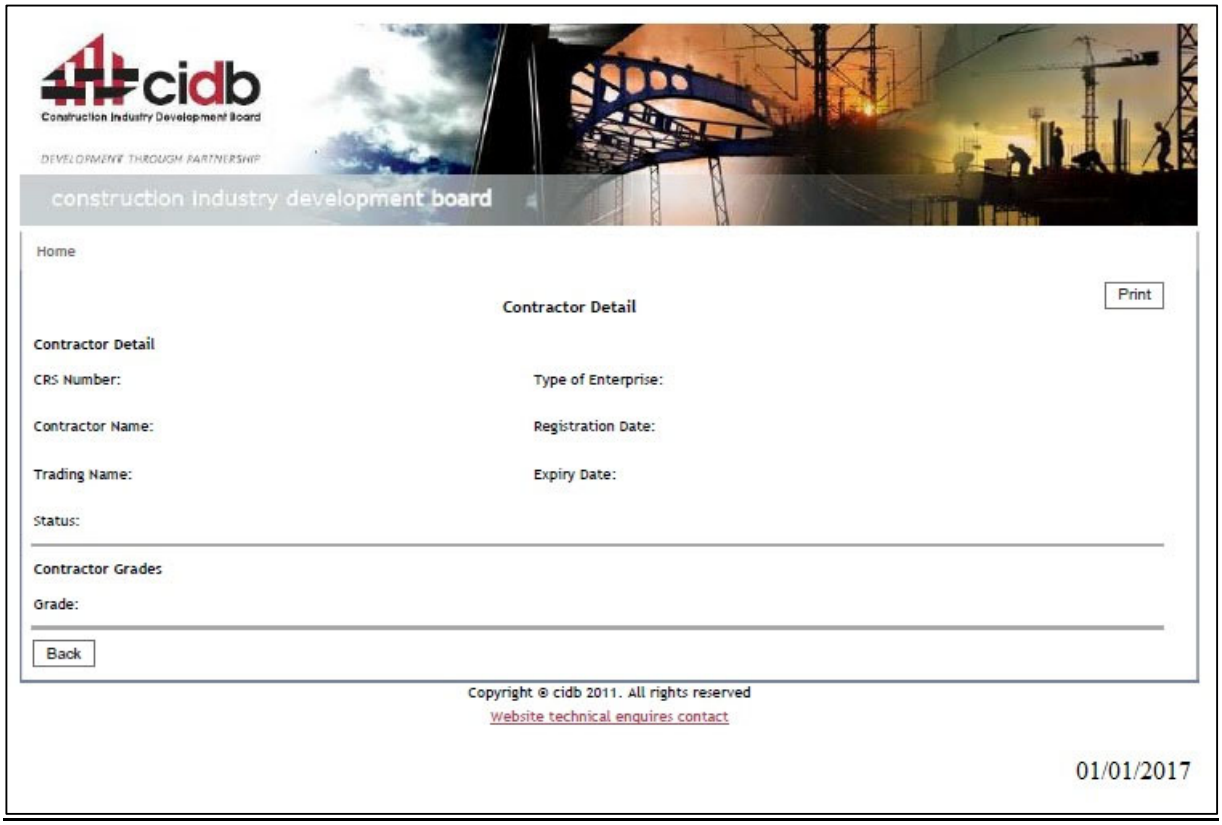
T2.2.15 ELIGIBILITY: VERIFICATION OF CIDB REGISTRATION AND STATUS

Reference is to be made to Clause F.2.1.1 and F.2.23 of the Tender Data.

The Conditions of Tender, **Clause F.2.1.1: Eligibility**, requires a tenderer to be registered, as "Active", with the CIDB (at time of tender closing), in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations. The required class of construction work is specified in Clause F.2.1.1.

CIDB Registrations can be obtained from the CIDB website at https://registers.cidb.org.za/PublicContractors/ContractorSearch. The date of obtaining the printout is to be indicated on the printout.

The following is an example of the beginning of the printout obtained from the above website.



Tenderers are to include, at the back of their tender submission document, a printout of their registration with the CIDB.

*I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, **and that the requested documentation has been included in the tender submission**.*

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------.

T2.2.16 EXPERIENCE OF TENDERER

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

The following is a statement of works of similar nature (in relation to the scope of works) recently (within the past 10 years) executed by myself / ourselves.

Tenderers are to submit copies of **SIGNED COMPLETION CERTIFICATES** for all projects submitted.

EMPLOYER: CONTACT PERSON AND TELEPHONE NUMBER	CONSULTING ENGINEER: CONTACT PERSON AND TELEPHONE NUMBER	NATURE OF WORK	VALUE OF WORK (inclusive of VAT)	DATE COMPLETED

Attach additional pages if more space is required

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): .... **Date**

SIGNATURE: ....

T2.2.17 PROPOSED ORGANISATION and STAFFING

Refer to Clause F3.11.9 for Functionality Points evaluation prompts.

The tenderer should propose the structure and composition of their team i.e. the main disciplines involved, the key staff member / expert responsible for each discipline, and the proposed technical and support staff and site staff.

The roles and responsibilities of each key staff member / expert should be set out as job descriptions. In the case of an association / joint venture / consortium, it should, indicate how the duties and responsibilities are to be shared.

The tenderer must attach his / her organization and staffing proposals to this page. (this is to include both the on-site and off-site staffing resources used for this project)

In addition to any lists, this information should also be shown in an organogram format (flow chart) clearly indicating the staff hierarchy and reporting lines, again for on- and off-site resources.

The tenderer is required indicate below the personnel allocated for each of the specific roles highlighted in order for the functionality points to be allocated correctly. The names listed below will be utilised for the scoring:

CONTRACTS MAGANER: _____

SITE AGENT: _____

FOREMAN: _____

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------

T2.2.18 KEY PERSONNEL

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

The Tenderer shall list below the personnel which he intends to utilize on the Works, including key personnel (Contract's Manager, Site Agent, and Foremen) which may have to be brought in from outside if not available locally.

CATEGORY OF EMPLOYEE	NUMBER OF PERSONS	
	KEY PERSONNEL, PART OF THE CONTRACTOR'S ORGANISATION	KEY PERSONNEL TO BE IMPORTED IF NOT AVAILABLE LOCALLY
Site Agent, Project Managers		
Foremen, Quality Control and Safety Personnel		
Technicians, Surveyors, etc		
Artisans and other Skilled workers		
Plant Operators		
Unskilled Workers		
Others:		
.....		

Note: CVs of key personnel may be requested during the contract period.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): ..... **Date**

SIGNATURE: ....

T2.2.19 EXPERIENCE OF KEY PERSONNEL

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

The experience of assigned staff member in relation to the Scope of Work will be evaluated from three different points of view:

1) General experience (total duration of professional activity), level of education and training and positions held of each discipline specific team leader.
2) The education, training, skills and experience of the Assigned Staff in the specific sector, field, subject, etc which is directly linked to the scope of work.
3) The key staff members' / experts' knowledge of issues which the tenderer considers pertinent to the project e.g. local conditions, affected communities, legislation, techniques etc.

A CV of the contract manager, site agent(s) and general foreman of not more than 2 pages should be attached to this schedule:

Each CV should be structured under the following headings:

a) Personal particulars
- name
- date and place of birth
- place (s) of tertiary education and dates associated therewith
- professional awards

b) Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations)

c) Skills

d) Name of current employer and position in enterprise

e) Overview of post-graduate / diploma experience (year, organization and position)

f) Outline of recent assignments / experience that has a bearing on the scope of work

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.20 PRELIMINARY PROGRAMME

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

The Tenderer shall detail below or attach a preliminary programme reflecting the proposed sequence and tempo of execution of the various activities comprising the work for this Contract. The programme shall be in accordance with the information supplied in the Contract, requirements of the Project Specifications and with all other aspects of his Tender.

PROGRAMME														
ACTIVITY	**WEEKS / MONTHS**													

Note: The programme must be based on the completion time as specified in the Contract Data.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

T2.2.21 CONSTRUCTION APPROACH, METHODOLOGY, AND QUALITY CONTROL

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

Construction Approach and Methodology

The construction approach and methodology must respond to the Scope of Work and outline the proposed approach to undertake the work showing a detailed programme including health and safety aspects, the use of plant and resources for this Project.

Quality Control

The quality control statement must discuss what tests and control measures are to be employed on site to attain the specified results and is to cover the program associated activities.

The tenderer must attach his / her Construction Methodology and Quality Control information to this page.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------

T2.2.22 SCHEDULE OF PROPOSED SUBCONTRACTORS

The following firms have been identified as possible subcontractors for work in this contract.

NAMES AND ADDRESSES OF PROPOSED SUBCONTRACTORS	NATURE AND EXTENT OF WORK TO BE SUBCONTRACTED	PREVIOUS EXPERIENCE WITH SUBCONTRACTOR

Attach additional pages if more space is required

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------

T2.2.23 PLANT and EQUIPMENT

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

The following are lists of major items of relevant equipment that I / we presently own or lease and will have available for this contract if my / our tender is accepted.

(a) Details of major equipment that is owned by me / us and immediately available for this contract.

DESCRIPTION (type, size, capacity etc)	QUANTITY	YEAR OF MANUFACTURE

Attach additional pages if more space is required

(b) Details of major equipment that will be hired, or acquired for this contract if my / our tender is accepted

DESCRIPTION (type, size, capacity etc)	QUANTITY	HOW ACQUIRED	
		HIRE/ BUY	SOURCE

Attach additional pages if more space is required

The Tenderer undertakes to bring onto site without additional cost to the Employer any additional plant not listed but which may be necessary to complete the contract within the specified contract period.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------

T2.2.24 CONTRACTOR'S HEALTH AND SAFETY PLAN

Refer to Clause F3.11.9 for Functionality Points evaluation prompts (if applicable).

At tender stage only a brief overview (**to be attached to this page**) of the tenderers perception on the safety requirements for this contract will be adequate.

Only the successful Tenderer shall submit separately the Contractor's Health and Safety Plan as required in terms of Regulation 7 of the Occupational Health and Safety Act 1993 Construction Regulations 2014.

The detailed safety plan will take into consideration the site specific risks as mentioned under C.3: Project Specification. A generic plan will not be acceptable.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: ---------- ----------

PART C1: AGREEMENT AND CONTRACT DATA

C1.1: FORM OF OFFER AND ACCEPTANCE

C1.1.1: OFFER

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract in respect of the following works:

Contract No: **WS-7638**

Contract Title: **Lovu Landfill Site: Construction of Cell 6 and Ancillary Works**

The Tenderer, identified in the Offer signature block below, has examined the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the Tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance, the Tenderer offers to perform all of the obligations and liabilities of the Contractor under the Contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the Conditions of Contract identified in the Contract Data.

*** The offered total of the prices inclusive of Value Added Tax is:**

R..... (*In words* .....

.....)

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

For the Tenderer:

*** Name of Tenderer** *(organisation)* **:** .....

*** Signature** *(of person authorized to sign the tender)* **:** .....

*** Name** *(of signatory in capitals)* **:** .....

Capacity *(of Signatory)* **:** .....

Address : .....

: .....

Telephone : .....

Witness:

Signature : ..... **Date** : .....

Name *(in capitals)* : : .....

Notes:
*** Indicates what information is mandatory.**
Failure to complete the mandatory information and sign this form will invalidate the tender.

C1.1: FORM OF OFFER AND ACCEPTANCE

C1.1.2: FORM OF ACCEPTANCE

This Form will be completed by the Employer

By signing this part of the Form of Offer and Acceptance, the Employer identified below accepts the Tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the Conditions of Contract identified in the Contract Data. Acceptance of the Tenderer's Offer shall form an agreement between the Employer and the Tenderer upon the terms and conditions contained in this Agreement and in the Contract that is the subject of this Agreement.

The terms of the contract are contained in:

- Part C1 : Agreement and Contract Data, (which includes this Agreement)
- Part C2 : Pricing Data, including the Bill of Quantities
- Part C3 : Scope of Work
- Part C4 : Site Information

and the schedules, forms, drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules as well as any changes to the terms of the Offer agreed by the Tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Agreement. No amendments to or deviations from said documents are valid unless contained in this Schedule, which must be duly signed by the authorised representatives of both parties.

The Tenderer shall within two weeks after receiving a completed copy of this Agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data at, or just after, the date this Agreement comes into effect. Failure to fulfill any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any). Unless the Tenderer (now Contractor) within five days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this Agreement, this Agreement shall constitute a binding contract between the parties.

Signature *(person authorized to sign the acceptance)* **:** .....

Name *(of signatory in capitals)* **:** .....

Capacity *(of Signatory)* **:** .....

Name of Employer *(organisation)* **:** .....

Address : .....

: .....

Witness:

Signature : ..... **Date** : .....

Name*(in capitals)* : : .....

C1.1: FORM OF OFFER AND ACCEPTANCE
C1.1.3: SCHEDULE OF DEVIATIONS

This form will be completed by THE EMPLOYER and ONLY THE SUCCESSFUL TENDERER

1. Subject : ……..

Details : ……..

: ……..

2. Subject : ……..

Details : ……..

: ……..

3. Subject : ……..

Details : ……..

: ……..

By the duly authorised representatives signing this Schedule of Deviations, the Employer and the Tenderer agree to and accept the foregoing Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Tenderer and the Employer during this process of offer and acceptance.

FOR THE TENDERER		**FOR THE EMPLOYER**
……..……..	Signature	……..……..
……..……..	Name *(in capitals)*	……..……..
……..……..	Capacity	……..……..
……..……	Name and Address of	……..……
……..	Organisation	……..
……..		……..
……..		……..
……	Witness Signature	……
……..	Witness Name	……..
……..	Date	……..

C1.2: CONTRACT DATA

C1.2.1 CONDITIONS OF CONTRACT

C1.2.1.1 GENERAL CONDITIONS OF CONTRACT

The Conditions of Contract are the General Conditions of Contract for Construction Works (2015 3rd Edition), (GCC 2015) published by the South African Institution of Civil Engineering. Copies of these conditions of contract may be obtained from the South African Institution of Civil Engineering (Tel: 011-805-5947, Fax: 011-805-5971, E-mail: civilinfo@saice.org.za).

The Contract Data (including variations and additions) shall amplify, modify, or supersede, the GCC 2015 to the extent specified below, and shall take precedence and shall govern.

Each item of data given below is cross-referenced to the clause in the GCC 2015 to which it mainly applies.

C1.2.2 CONTRACT DATA

C1.2.2.1 DATA TO BE PROVIDED BY THE EMPLOYER

1.1.1.13 The **Defects Liability Period**, from the date of the Certificate of Completion, is **1 Year**.

1.1.1.14 The **time for achieving Practical Completion**, from the Commencement Date is **110 Weeks**. The period as stated in 5.3.2, and the 7 days referred to in 5.3.3, are included in the above time for achieving Practical Completion. The special non-working days as stated in 5.8.1 are excluded from the above time for achieving Practical Completion.

1.1.1.15 The Employer is the eThekwini Municipality as represented by:
Deputy Head: **Plant and Engineering**

1.2.1.2 The address of the Employer is:
Physical: 22 Electron Road, Springfield, Durban, 4001/ Cleansing & Solid Waste Unit, 17 Electron Road, Springfield, Durban, 4001
Postal: 22 Electron Road, Springfield, Durban, 4001
Telephone: 031 322 4575
Fax: 031 322 2521
E-Mail: Logan.Moodley2@gmail.gov.za

1.1.1.16 The **name of the Employer's Agent** is J Pass Pr. Eng; Wilson and Pass Incorporated
1.2.1.2 The address of the Employer' Agent is:
Physical: 7 Huntly Wood, 156 Jan Hofmeyr Road, Westville, 3630
Postal: P O Box 641, Westville 3630
Telephone: 082 463 1127(t)
Fax: 031 266 2840 (f)
E-Mail: jon.pass@pixie.co.za / jonathan@wpice.co.za

1.1.1.26 The **Pricing Strategy** is by **Re-measurement Contract**.

3.2.3 The Employer's Agent shall obtain the **specific approval of the Employer** before executing any of his functions or duties according to the following Clauses of the General Conditions of Contract:

- 6.3: Council approval in order to authorise any expenditure in excess of the Tender Sum plus**10%** contingencies.

4.11.1 To carry out and complete the works, the Contractor shall employ a competent Site Agent and Foreman as part of the key staff. It is a requirement for the Contractor's Site Agent and Foreman to each have a minimum of 3 years relevant experience including experience on projects of a similar nature. The CV's of the Site Agent and the Foreman should be submitted to the Employer's Agent's Representative for acceptance by the Department (reference is made to Cl.5.3.1 of the Contract Data).

Note:

i) "similar nature" implies projects that were of a value of at least 70% of this tender's value, and had a comparable Scope of Work in terms of technical requirements and operations.

ii) "experience" implies experience on projects of a similar nature.

iii) "accredited degree / diploma" implies a minimum 3-year qualification within the built environment, from a registered University or Institute of Technology.

5.3.1 The **documentation required** before commencement with Works execution are:

- Health and Safety Plan (refer to Clause 4.3)
- Initial Programme (refer to Clause 5.6)
- Security (refer to Clause 6.2)
- Insurance (refer to Clause 8.6)
- CV(s) of Key Site Staff (refer to Clause 4.11.1)
- CPG Implementation Plan

5.3.2 The **time to submit the documentation** required before commencement with Works is **14 Days**.

5.3.3 Add the following paragraph:

"If a construction work permit, in terms of Clause 3(1) of the Construction Regulations (2014), is applicable, the instruction to commence carrying out of the works may only be issued once the construction work permit has been obtained by the Employer's Agent. If a construction work permit is applicable, the contractor shall allow for a minimum period of 37 days, after the submission (or re-submission) of the documentation referred to in Clause 5.3.1., for the issuing of the construction work permit."

5.4.2 The access and possession of Site shall not be exclusive to the Contractor but as set out in the Site Information.

5.8.1 The **non-working days** are **Saturdays and** Sundays.

(5.1.1) The **special non-working** days are:

- All statutory holidays as declared by National or Regional Government.
- The year-end break:
  - Commencing on the first working day after 15 December.
  - Work resumes on the first working day after 5 January of the next year.

5.8.1 Delete the words "sunset and sunrise" and replace with "17:00 and 07:00".

5.12.2.2 **Abnormal Climatic Conditions (Rain Delays)** - The numbers of days per month, on which work is expected not to be possible as a result of rainfall, for which the Contractor shall make provision, is given in the table below. During the execution of the Works, the Employer's Agent's Representative will certify a day lost due to rainfall only if at least 75% of the work force and plant on site could not work during that specific working day.

Extension of time as a result of rainfall shall be calculated monthly being equal to the number days certified by the Employer's Agent's Representative as lost due to rainfall, less the number of days allowed for as in table below, which could result in a negative figure for certain months. The total extension of time for which the Contractor may apply, shall be the cumulative algebraic sum of the monthly extensions. Should the sum thus obtained be negative, the extension of time shall be taken as NIL.

Month	Days Lost	Average Rainfall	Month	Days Lost	Average Rainfall
January	4*	134	July	1	39
February	3	113	August	2	62
March	3	120	September	2	73
April	2	73	October	3	98
May	2	59	November	3	108
June	1	28	December	1*	102
TOTAL	27	1009mm	* = The number of working days lost allows for the annual statutory Construction holiday in December and January of each year.		

5.13.1 The **penalty for delay** in failing to complete the Works is **R 5 000.00** (per Day).

5.14.1 The **requirements for achieving Practical Completion** will be determined by the Employer's Agent (in consultation with the Contractor) and recorded in the minutes of the first Site Meeting / Handover Meeting. (Refer to 1.1.1.24 for a generic definition.) The requirements are to be regularly reviewed with respect to any variations to the Contract.

5.16.3 The **latent defect liability** period is **10 Years**.

6.2.1 **Security (Performance Guarantee)**: Delete the word "selected" and replace it with "stated".

The liability of the Performance Guarantee shall be as per the following table:

Value of Contract (incl. VAT)	Performance Guarantee Required
Less than or equal to R 1m	Nil
Greater than R 1m and less than or equal to R 10m	5% of the Contract Sum
Greater than R 10m	10% of the Contract Sum

6.5.1.2.3 The **percentage allowance** to cover overhead charges for daywork are as follows:

- **80%** of the gross remuneration of workmen and foremen actually engaged in the daywork;
- **20%** on the net cost of materials actually used in the completed work.

No allowance will be made for work done, or for materials and equipment for which daywork rates have been quoted at tender stage.

6.8.2 **Contract Price Adjustment Factor**: The value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule (GCC 2015 - page 86) with the following Indices / Descriptions / Coefficients:

- The proportion not subject to adjustment: **x = 0.10**.
- The base month will be the month prior to the month in which tenders close.

- The Index for Labour, Plant, and Materials shall be based on **December 2021 = 100**.
- The Index for Fuel shall be based on **December 2020 = 100**.

	STATS SA Statistical Release	Table	Description	Coefficient
• "L" is the "Labour Index"	P0141	Table A	Geographic Indices; CPI per Province; Kwa-Zulu Natal	**a = 0.28**
• "P" is the • "Contractor's Equipment Index"	P0151.1	Table 4	Plant and Equipment	**b = 0.28**
• "M" is the "Materials Index"	P0151.1	Table 6	Civil Engineering Material (excluding bitumen)	**c = 0.38**
• "F" is the "Fuel Index"	P0142.1	Table 1	Coke, petroleum, chemical, rubber and plastic products; Coal and petroleum products; Diesel	**d = 0.06**

6.8.3 Price adjustments for **variation in the cost of the special material(s)** listed below, will be allowed.

Bitumen - escalation will be calculated using the "Rise and Fall" method as determined by the Employer. The base price for bitumen on this contract shall be the ruling price of 50/70 grade bitumen based on the "Shell Whole Sale List Selling Price for Penetration Grade Bitumen", seven (7) days prior to the closing date of tenders.

6.10.1.5 The **percentage advance** on materials not yet built into the Permanent Works is **80%**.

The **percentage advance** on Plant not yet supplied to Site: **Not Required**

6.10.3 **Retention Money:** Delete the word "selected".
The percentage retention on the amounts due to the Contractor is 10%.
The limit of "retention money" is 5% of the Contract Sum.
Should the Contract Price exceed the Contract Sum then the limit of "retention money" is 5% of the Contract Price.
Interest will not be paid on retention withheld by the Employer.

8.6.1.1.2 The **value of Plant and materials** supplied by the Employer to be included in the insurance sum: **Not Required**.

8.6.1.1.3 The **amount to cover professional fees** for repairing damage and loss to be included in the insurance sum: **Not Required**.

8.6.1.2 **SASRIA Coupon Policy** for Special Risks to be issued in joint names of Council and Contractor for the full value of the works (including VAT).

8.6.1.3 The limit of indemnity for **liability insurance**: **R10 000 000.00**.

8.6.1.4 **Ground Support Insurance**:

- Minimum amount for any one occurrence, unlimited as to the number of occurrences, against any claim for damages or loss caused by vibration and / or removal of lateral support: **R2 000 000.00**.
- Maximum first excess: **R10 000.00**.

8.6.1.5 Furthermore, the insurance cover effected by the Contractor shall meet the following requirements:

Third Party Insurance (Public Liability)

- Minimum amount for any one occurrence, unlimited as to the number of occurrences, for the period of the contract, inclusive of the maintenance period: **R1 000 000.00**.
- Consequential loss to be covered by policy: **Yes**
- Liability section of policy to be extended to cover blasting: **R5 000 000.00**.
- Maximum excess per claim or series of claims arising out of any one occurrence: **R20 000.00**.

Principal's own surrounding Property Insurance

- Minimum amount for any one occurrence unlimited as to the number of occurrences against any claim for damage which may occur to the Council's own surrounding property: **R1 000 000.00**.
- Maximum first excess: **R10 000.00**.

Insurance of Works

- Minimum amount for additional removal of debris (no damage): **Nil**.
- Minimum amount for temporary storage of materials off site, excluding Contractor's own premises: **Nil**.
- Minimum amount for transit of materials to site: **Nil**.

8.6.5 **Approval by Employer**: At the end of the sub-clause, add the following paragraph:

"Except where otherwise provided in the Special Conditions of Contract, the insurance cover effected by the Contractor in terms of this clause shall not carry a first loss amount greater than those set out below:

Contract Price	First Loss
Less than R 100,000	R 5,000
R 100,000 to R 500,000	R 10,000
R 500,000 to R 1,000,000	R 20,000
R 1,000,000 to R 2,000,000	R 30,000
R 2,000,000 to R 4,000,000	R 40,000
Greater than R 4,000,000	R 50,000

The insurance policy shall contain a specific provision whereby cancellation of the policy prior to the end of the period referred to in Cause 8.2.1 cannot take place without the prior written approval of the Employer."

10.7.1 Failing ad-hoc adjudication, the determination of disputes shall be by arbitration.

C1.2.2.2 DATA TO BE PROVIDED BY CONTRACTOR

1.1.1.9 The legal name of Contractor is:

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1.2.1.2 The Physical address of the Contractor is:

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The Postal address of the Contractor is:

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The contact numbers of the Contractor are:

Telephone: ……

Fax: ……

The E-Mail address of the Contractor is:

……

6.5.1.2.3 The **percentage allowance** to cover overhead charges for daywork are as follows:

- % of the gross remuneration of workmen and foremen actually engaged in the daywork; ……80%
- **%** on the net cost of materials actually used in the completed work. ……20%

C1.2.3 ADDITIONAL CONDITIONS OF CONTRACT

C1.2.3.1 COMMUNITY LIAISON OFFICER

The Ward Councillor(s) in whose ward(s) work is to be done will, collectively, identify a community liaison officer (CLO) for the project and make the person known to the Contractor within two days of being requested to do so. The Contractor will be required to enter a written contract with the CLO that specifies:

- The hours of work and the wage rate of the CLO (200% of the Civil Engineering Industry minimum wage).
- The duration of the appointment.
- The duties to be undertaken by the CLO which could include:
  - Assisting in all respects relating to the recruitment of local labour.
  - Acting as a source of information for the community and councillors on issues related to the contract.
  - Keeping the Contractor advised on community issues and issues pertaining to local security.
  - Assisting in setting up any meetings or negotiations with affected parties.
  - Keeping a written record of any labour or community issue that may arise.
  - Any other duties that may be required by the Contractor.

Responsibility for the identification of a pool of suitable labour shall rest with the CLO, although the Contractor shall have the right to choose from that pool. The Contractor shall have the right to determine the total number labourers required at any one time and this may vary during the contract.

The Contractor shall have the right to replace labour that is not performing adequately. Should such occasion arise, it must be done in conjunction with the CLO.

Payment: The CLO will be reimbursed from the PC Sum item in the Preliminary & General Section of the Bill of Quantities.

C1.2.3.2 EMPLOYMENT OF LOCAL LABOUR

It is a condition of contract that the contractor will be required to employ local labour as specified in eThekwini Council Policy “The use of CLOs and Local Labour”. The contractor will be required to ensure that a minimum of 50% of the labour force is made up of local labour. For the purposes of this contract, “Local labour” will be deemed to be any **persons who reside within Ward 98.** The contractor will be required to provide proof of authenticity of local labour. Signed confirmation by the appointed CLO will suffice for this.

No additional costs will be entertained due to this Particular Specification. The contractor will remain responsible for providing proper supervision of all labour and will be responsible for the quality of work produced.

C1.2.3.3 CONTRACTOR PARTICIPATION GOAL (CPG)

It is a condition of contract that the contractor must allow for a minimum of **30%** of the contract value (excluding PC Sum items and Fixed Cost allowances) to be subcontracted to contractors who are **>51% PPG** (Priority Population Group) owned. Proof of payment to the subcontractors will be required to verify that the minimum has been achieved.

The penalty for not achieving the specified CPG will be 0.5% of the contract value (excluding PC Sum items and Fixed Cost allowances) for every 1% of CPG not achieved**.**

C1.2.3.4 FTE (Full Time Equivalent) EMPLOYMENT INFORMATION

It is a condition of contract that the Contractor supplies the Employer's Agent's Representative with information in respect of the employment of all foremen, artisans and labour (skilled and unskilled) employed to work on this contract. The information required is:

- Initials (per ID doc)
- Last Name (per ID doc)
- ID Number
- Disability (y / n)
- Education Level

Level 1 Unknown	**Level 2** No Schooling	**Level 3** Grade 1-3	**Level 4** Grade 4	**Level 5** Grade 5-6
Level 6 Grade 7-8	**Level 7** Grade 9	**Level 8** Grade 10-11	**Level 9** Grade 12	**Level 10** Post Matric

- Category of Employment

Category A: Employed as Local Labour for this contract only
Category B: Temporarily employed by the Contractor
Category C: Permanently employed by the Contractor

In addition, the following information is required in respect of each person listed above, on a monthly basis:

- Number of days worked during the month;
- Daily wage rate;
- Number of training days during the month.

The information is to be forwarded in a format acceptable to the Employer's Agent's Representative, but preferably in the form of an emailed EXCEL file (an original file, to be used as a template, will be issued to the Contractor). Contractors without computer facilities will be required to submit a hard copy of the information in a format as agreed to between the Contractor and the Employer's Agent's Representative.

In addition to the tax invoice, to be submitted by the Contractor with his monthly statement, mentioned in Clause 6.10.4 of GCC 2015, the Employer reserves the right to withhold payment until the monthly FTE information has been forwarded to the Employer's Agent's Representative. No additional payment for complying with the above will be made and the Contractor is to make allowance for complying through the time related P & G items (sum) under Part AA: Preliminaries, of the Bill of Quantities.

C1.2.3.5 PERFORMANCE MONITORING OF SERVICE PROVIDERS

[For contract awards over R10m] The Contractor shall be subjected to "Performance Monitoring" assessments in terms of the applicable Section (S.53) of the Employer's Supply Chain Management Policy.

Key Performance Indicators (KPIs) are specified in the C3: Scope of Works, or will be discussed and agreed with the Contractor before commencement of the contract.

C1.2.3.6 EXCEPTED RISKS (Clause 8.3)

Pursuant to Clause 8.3 of the Conditions of Contract (GCC 2015), the Employer shall not be liable for the payment of standing time costs as a result of the occurrence of any of the "Excepted Risks" as defined under Clause 8.3.

However, the Employer shall reimburse the Contractor in respect of plant de-establishment and re-establishment costs as a result of "Excepted risks" when a written instruction to de-establish is issued to the Contractor.

C2.1: PRICING ASSUMPTIONS / INSTRUCTIONS

C2.1.1 GENERAL

The Bill of Quantities forms part of the Contract Documents and must be read and priced in conjunction with all the other documents comprising the Contract Documents (refer to F.1.2 of the Tender Data).

C2.1.2 PRICING INSTRUCTIONS AND DESCRIPTION OF ITEMS IN THE SCHEDULE

Measurement and payment shall be in accordance with the relevant provisions of Clause 8 of each of the Standard Engineering Specifications referred to in the Scope of Work. The Preliminary and General items shall be measured in accordance with the provisions of C2.1.8.

The descriptions of the items in the Bill of Quantities are for identification purposes only and comply generally with those in the Standard Engineering Specification.

Clause 8 of each Standard Engineering Specification, read together with the relevant clauses of the Scope of the works, set out what ancillary or associated work and activities are included in the rates for the operations specified. Should any requirements of the measurement and payment clause of the applicable Standard Engineering Specification, or the Scope of the works, conflict with the Bill of Quantities, the requirements of the Standard Engineering Specification or Scope of the work, as applicable, shall prevail.

C2.1.3 QUANTITIES REFLECTED IN THE SCHEDULE

The quantities given in the Bill of Quantities are estimates only, and subject to re-measuring during the execution of the work. The Contractor shall obtain the Employer's Agent's detailed instructions for all work before ordering any materials or executing work or making arrangements for it.

The Works as finally completed in accordance with the Contract shall be measured and paid for as specified in the Bill of Quantities and in accordance with the General and Special Conditions of Contract, the Specifications and Project Specifications and the Drawings. Unless otherwise stated, items are measured net in accordance with the Drawings, and no allowance has been made for waste.

The validity of the contract will in no way be affected by differences between the quantities in the Bill of Quantities and the quantities finally certified for payment.

C2.1.5 MONTHLY PAYMENTS

Unless otherwise specified in the Specifications and Project Specifications, progress payments in Interim Certificates, referred to in Clause 6.10.1 of the General Conditions of Contract, in respect of "sum" items in the Bill of Quantities shall be by means of interim progress instalments assessed by the Employer's Agent and based on the measure in which the work actually carried out relates to the extent of the work to be done by the Contractor.

C2.1.4 PROVISIONAL SUMS / PRIME COST SUMS

Where Provisional Sums or Prime Cost sums (PC Sum) are provided for items in the Bill of Quantities, payment for the work done under such items will be made in accordance with Clause 6.6 of the General Conditions of Contract. The Employer reserves the right, during the execution of the works, to adjust the stated amounts upwards or downwards according to the work actually done under the item, or the item may be omitted altogether, without affecting the validity of the Contract.

The Tenderer shall not under any circumstances whatsoever delete or amend any of the sums inserted in the "Amount" column of the Bill of Quantities and in the Summary of the Bill of Quantities unless ordered or authorized in writing by the Employer before closure of tenders. Any unauthorized changes made by the Tenderer to provisional items in the schedule, or to the provisional percentages and sums in the Summary of the Bill of Quantities, will be treated as arithmetical errors.

C2.1.6 PRICING OF THE BILL OF QUANTITIES

The prices and rates to be inserted by the Tenderer in the Bill of Quantities shall be the full inclusive prices to be paid by the Employer for the work described under

the several items, and shall include full compensation for all costs and expenses that may be required in and for the completion and maintenance during the defects liability period of all the work described and as shown on the drawings as well as all overheads, profits, incidentals and the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the Tender is based.

Each item shall be priced and extended to the "Total" column by the Tenderer, with the exception of the items for which only rates are required (Rate Only), or items which already have Prime Cost or Provisional Sums affixed thereto. If the Contractor omits to price any items in the Bill of Quantities, then these items will be considered to have a nil rate or price.

All items for which terminology such as "inclusive" or "not applicable" have been added by the Tenderer will be regarded as having a nil rate which shall be valid irrespective of any change in quantities during the execution of the Contract.

All rates and amounts quoted in the Bill of Quantities shall be in Rands and Cents and shall include all levies and taxes (other than VAT). VAT will be added in the Summary of the Bill of Quantities.

C2.1.7 "RATE ONLY" ITEMS

The Tenderer shall fill in rates for all items where the words "Rate Only" appear in the "Total" column. "Rate Only" items have been included where:

(a) an alternative item or material is contemplated;
(b) variations of specified components in the make-up of a pay item may be expected; and
(c) no work under the item is foreseen at tender stage but the possibility that such work may be required is not excluded.

For "Rate Only" items no quantities are given in the "Quantity" column but the quoted rate shall apply in the event of work under this item being required. The Tenderer shall however note that in terms of the Tender Data the Tenderer may be asked to reconsider any such rates which the Employer may regard as unbalanced.

C2.1.8 PRELIMINARY AND GENERAL

The Preliminary and General Section is provided to cover the Contractor's expenses incurred in complying with the requirements of the tender documents and consists of the following parts:

- Part AA: Preliminaries
- Part AB: General Specifications
- Part AH: Occupational Health and Safety

Fixed Charge Items: Each item should be priced separately and, subject to the Engineer certifying in terms of Clause 6.7 of the General Conditions of Contract that the work has been done, payment will be made as follows:

(i) the total amount due when the certified value fixed charge items in this section is less than 5% of the net contract price;
(ii) when the certified value of fixed charge items in this section is greater than 5% of the net contract price, payment will be limited to 5% of the net contract price. The remainder will be paid when the value of the work done under the contract, excluding the value of fixed charge items in this section, is greater than 50% of the net contract price, excluding the value of fixed charge items in this section.

Time Related Items: Any Time Related items not priced shall be deemed to be covered by the prices of other items in the section.

Payment of Time Related items in this section will be made throughout the contract period, the amount per month being the value of the item divided by the completion in months or, if specified in weeks, the equivalent number of months, in terms of Clause 5.5 of the General Conditions of Contract. The final monthly increment will only be paid upon the issue of a completion certificate.

C2.2: BILL OF QUANTITIES

The Bill of Quantities follows and comprises of XX pages. The pages are numbered BoQ 1 to BoQ XXX

SECTION 1 : PRELIMINARY AND GENERAL

Item	Payment Ref	Description	Unit	Total	Rate	Amount
	SABS 1200A GENERAL					
		SCHEDULED FIXED CHARGE & VALUE RELATED ITEMS				
1.1	A.8.3.1	Contractual requirements, sureties & insurance	sum			
	PSA.8.3.2	Establishment of facilities on site				
1.2	PSAB.3.2	Offices for Engineer & staff and notice board	sum			
	PSA.8.3.2.2	Facilities for the Contractor				
1.3		a) Offices & storage sheds	sum			
1.4		b) Workshops	sum			
1.5		e) Ablution & latrine facilities	sum			
1.6		f) Tools & equipment	sum			
1.7		g) Water supplies, electric power & communications	sum			
1.8		h) Dealing with leachate, water & dust.	sum			
1.9		i) Access	sum			
1.10		j) Plant	sum			
1.11	PSA.8.3.3 & PS 11	Other fixed-charge obligations: setting out, security, deviations and dealing with traffic.	sum			
1.12	PSA.8.3.5	As-built survey	sum			
1.13	PS-10.3	Contractor's obligations in respect of the Occupational Health and Safety Act and any other Health & Safety regulations as may be applicable i.e. Covid-19 compliance.	sum			
1.14	A.8.3.4	Removal of site establishment	sum			
		TOTAL FIXED CHARGE ITEMS TO SUMMARY			**R**	

SECTION 1 : PRELIMINARY AND GENERAL continued

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
		SCHEDULED TIME-RELATED ITEMS				
1.15	A.8.4.1	Contractual requirements, sureties & insurance	sum			
1.16	A.8.4.2	Operate & maintain facilities for the duration of the contract	sum			
1.17	PSAB.3.2	Offices for Engineer & staff and notice board	sum			
	PSA.8.4.2.2	Facilities for the Contractor for the duration of construction				
1.18		a) Offices & storage sheds	sum			
1.19		b) Workshops	sum			
1.20		e) Ablution & latrine facilities	sum			
1.21		f) Tools & equipment	sum			
1.22		g) Water supplies, electric power & communications	sum			
1.23		h) Dealing with leachate, water & dust	sum			
1.24		i) Access	sum			
1.25		j) Plant	sum			
1.26	A.8.4.3	Supervision for duration of construction	sum			
1.27	A.8.4.4	Company & head office overhead costs for the duration of the contract	sum			
1.28	PSA.8.4.5 & PS 11	Other time-related obligations: setting out, survey for as-built drawings, security, deviations and dealing with traffic.	sum			
		TOTAL TIME RELATED ITEMS TO SUMMARY			**R**	

SECTION 1 : PRELIMINARY AND GENERAL continued

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
		SUMS STATED PROVISIONALLY BY ENGINEER				
1.29	PSA.8.5(b) 1)	Cost of acceptance testing		Prov sum		R50,000.00
1.30		Overheads, charges & profit on item above	%	R 50 000.00		
1.31	PSA.8.5(b) 1)	Additional survey as required		Prov sum		R15,000.00
1.32		Overheads, charges & profit on item above	%	R 15 000.00		
1.33	PSA.8.5(b) 1)	Indigenous vegetation & education facilities		Prov sum		R25,000.00
1.34		Overheads, charges & profit on item above	%	R 25 000.00		
1.35	PSA.8.5(b) 1)	Environmental Construction Management Plan audits		Prov sum		R50,000.00
1.36		Overheads, charges & profit on item above	%	R 50 000.00		
1.37	PSA.8.5(b) 1)	Community Liaison officer		Prov sum		R400,000.00
1.38		Overheads, charges & profit on item above	%	R 400 000.00		
1.39	PSA.8.5(b) 1)	Mentoring of CPG Contractor		Prov sum		R100,000.00
1.40		Overheads, charges & profit on item above	%	R 100 000.00		
1.41	PSA.8.5(b) 1)	Allowance for a Social Facilitator		Prov sum		R200,000.00
1.42		Overheads, charges & profit on item above	%	R 200 000.00		
1.41	PSA.8.5(b) 1)	Flowmeters for leachate measurement		Prov sum		R50,000.00
1.42		Overheads, charges & profit on item above	%	R 50 000.00		
1.41	PSA.8.5(b) 1)	Temperature monitoring		Prov sum		R100,000.00
1.42		Overheads, charges & profit on item above	%	R 100 000.00		
1.43	PSA.8.5(b) 1)	Provision of a CQA Plan as required by the regulatory authorities conditions of approval.		Prov sum		R150,000.00
1.44		Overheads, charges & profit on item above	%	R 150 000.00		
1.45	PSA.8.5(b) 1)	Irrigation system for contaminated stormwater.		Prov sum		R250,000.00
1.46		Overheads, charges & profit on item above	%	R 250 000.00		
1.47	PSA.8.5(b) 1)	Workshop & washbay relocation		Prov sum		R900,000.00
1.48		Overheads, charges & profit on item above	%	R 900 000.00		
1.49	PSA.8.5(b) 1)	Services (water and electricity) to relocated workshop & washbay		Prov sum		R250,000.00
1.50		Overheads, charges & profit on item above	%	R 250 000.00		
1.51	PSA.8.5(b) 1)	Pump from Leachate Pond 3 to Leachate Treatment Plant		Prov sum		R300,000.00
1.52		Overheads, charges & profit on item above	%	R 300 000.00		
		TOTAL PROVISIONAL SUMS TO SUMMARY			**R**	

SECTION 2 : SITE CLEARANCE

Item	Payment Ref	Description	Unit	Total	Rate	Amount
	SABS 1200C SITE CLEARANCE					
2.1	PSC.8.2.1	Clear and grub including the removal of all sugar cane, any trees (girth up to 2,0m), stumps, poles, trimming of above ground obstructions including refuse, rubble roads and fencing. Including reclearing as instructed. All inc transport within 2km.	m2	55 000		
2.2	PSC.8.2.10	Remove approx. 150mm topsoil & stockpile	m3	4 000		
2.3	PSC.8.2.11	Transplanting trees.	No.	5		
2.4	PSC 8.2.12	Remove refuse from existing edge berms and in area where Cell 4 is to be repaired. For liner overlap, Cell 4 repair and leachate drainage.	m3	3 500		
2.5	PSC 8.2.13	Remove protection materials from existing liner in overlap areas.	m	240		
2.6	PSC 8.2.14	Break out ex concrete approx. 250mm thick in paving, foundations and walls.	m3	30		
		SECTION 2 : TOTAL TO SUMMARY			**R**	

SECTION 3 : EARTHWORKS

Item	Payment Ref	Description	Unit	Total	Rate	Amount
	SABS 1200 D: EARTHWORKS					
3.1	PSD.8.3.2	a) Excavate in all materials, fill and **stockpile and maintain** as instructed. Inclusive of all benching volumes and haulage.	m3	105 000		
3.2	PSD.8.3.2	b) Excavate in all materials in natural ground or from existing stockpiles, fill and compact to 90% Mod AASHTO density or as instructed. Inclusive of all benching volumes and haulage.	m3	30 000		
3.3	D.8.3.3	c) Restricted excavation in all materials, compaction to 93% Mod AASHTO density. Inclusive of all benching volumes and haulage. (provisional).	m3	5 000		
3.4	DB.8.3.2	b) 2) Extra over all item above for hard rock excavation (provisional in LP 3 area).	m3	2 000		
3.4	PSD.8.3.8	**Existing services** c) Excavate by hand to expose existing services	m3	15		
3.5	D.8.3.10	a) Spreading of topsoil from stockpile	m2	3 000		
3.6	PSD.8.3.11	b) i) Grassing - sods	m2	1 000		
3.7	PSD.8.3.11	b) ii) Grassing - stolons (runners)	m2	1 000		
		SECTION 3 : TOTAL TO SUMMARY			**R**	

SECTION 4 : EARTHWORKS (PIPE TRENCHES)

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
	SABS 1200 DB : EARTHWORKS (PIPE TRENCHES)					
	PSDB.8.3.2 (a)	**Excavation & backfill in all materials for**				
4.1		1) Generally for 90 to 250mm inclusive outside diameter piping & drains. 0 - 1.2m depth.	m3	400		
4.2		2) Generally for 90 to 250mm inclusive outside diameter piping & drains. >1.2 - 2m depth.	m3	200		
4.3		3) 250 to 1050mm inclusive diameter piping & anchor trenches. 0 - 1.3m depth.	m3	500		
4.4		4) 250 to 1050mm inclusive diameter piping & anchor trenches. >1.3 - 2m depth.	m3	1 500		
4.5		5) gas drains in the leachate drainage stone layer.	m3	30		
4.6	DB.8.3.2	b) 2) Extra over item above for hard rock excavation (provisional).	m3	10		
4.7	DB.8.3	c) Excavation of unsuitable material from trench bottom (provisional)	m3	50		
	PSDB.8.3.3.1	**b) Imported backfill materials from commercial source**				
4.8		1) Selected fill material	m3	1 000		
4.9		2) Selected granular material (prov).	m3	500		
4.10		3) 19mm single sized crushed stone.	m3	200		
4.11		4) 53mm single sized crushed stone.	m3	600		
4.12	PSDB.8.3.8	**Anchor trench backfill** and bed & backfill pipes etc with cement stabilised material inclusive of 6% cement by mass, approved material for stabilisation, mixing, placing and compaction to 95% Mod AASHTO density. Generally in selected areas for pipe bedding and / or backfilling where specified.	m3	1 100		
		SECTION 4 : TOTAL TO SUMMARY			**R**	

SECTION 5 : EARTHWORKS (Roads, Subgrade)

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
	SABS 1200 DM: EARTHWORKS (Roads, Subgrade)					
		Treatment of roadbed: road and liner formation				
5.1	PSDM.8.3.3	a) 1) Treatment of in situ material by ripping and compacting to 93% Mod AASHTO density	m2	60 000		
	PSDM.8.3.4	**Cut to Fill, Borrow to Fill**				
5.2	PSDM.8.3.4	**a) Compacted Clay Liner.** Selected clay soil from site earthworks or stockpile, 600mm thick, compacted in 150mm layers to 95% Proctor density. Maximum slope 1v:2.5h. Provisional	m3	3 000		
5.3	PSDM.8.3.4	b) **Base.** Under drainage & monitoring system. Imported approved granular material, **G7 quality** generally 150mm thick. Compaction to 93% Mod AASHTO density. Slopes up to approximately 1v:2.5h.	m3	6 300		
5.4	PSDM.8.3.4	c) **Liner protection laye**r - imported approved granular material, G6 quality generally 125mm & 150mm thick. stabilised with 6% cement by mass inclusive of supply, mixing, placing, shaping and compact to 95% Mod AASHTO density. Slopes up to approximately 1v:2.5h.	m3	6 300		
5.5	PSDM.8.3.4	d) **Leachate drainage layer** - Imported 75mm single sized, hard, durable crushed stone to the Engineer's approval. 150mm and 300mm thick. Nominal compaction. Slopes up to approximately 1v:2.5h.	m3	6 000		
5.6	PSDM.8.3.4	e) G5 imported gravel generally 150mm thick gravel wearing course to roadways inc supply, placing & grader shaping where specified. Compaction to 98% Mod AASHTO density.	m3	1 000		
5.7	PSDM.8.3.4	f) G5 / G6 imported gravel generally 150mm thick to roadways and where specified, stabilised with 6% cement by mass inclusive of supply, mixing, placing, grader shaping and compact to 97% Mod AASHTO density.	m3	1 050		
5.8	PSDM.8.3.4	g) **Dumprock**. Imported quarried crushed rock to comply with DR in TRH 14, supply, place and spread, nominal compaction. Provisional.	m3	1 600		
5.9	PSDM.8.3.4	h) G7 selected fill material for road selected layer and where specified. Compaction to 95% Mod AASHTO density. Provisional.	m3	500		
5.10	PSDM.8.3.4	j) **Waste cover**. Material from site stockpiles, placed 150mm to 200mm thick on existing waste and compacted to 90% Mod AASHTO density or as approved.	m3	4 000		
5.11	PSDM.8.3.15	Excavation & filling for catchwater mounds and channels incl. working on 1v:3h landfill slopes, forming and compaction	m3	1 200		
5.12	PSDM.8.2.17	**Cell edge & internal berms** : Supply approved granular material, stabilised with 6% cement by mass inclusive of supply, mixing, placing, shaping and compact to 95% Mod AASHTO density.	m3	1 200		
		SECTION 5 : TOTAL TO SUMMARY			**R**	

SECTION 6 : ROADS : SURFACING

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
	SABS 1200 ME, MF, MH & MK: SUBBASE, BASE, SURFACING & KERBING					
		Base Course				
6.1	MF.8.3.3	b) Graded crushed stone base (G2) compacted to 100% Mod AASHTO density, generally 150mm thick. Provisional.	m3	230		
		Surfacing (new or overlay)				
6.2	MH.8.5.1	Prime coat MSP 1 at 0,8l/m2	m2	2 000		
6.3	MH.8.5.3	Tack coat MSP 1 at 0,2l/m2	m2	1 000		
6.4	MH.8.5.4	Asphalt wearing course 25mm up to 40mm thickness continuous grade with 5% bitumen content. Paver laid	t	100		
6.5	MH.8.5.4	Asphalt wearing course 25mm up to 40mm thickness continuous grade with 5% bitumen content. Hand laid in repaired areas.	t	50		
	COLTO Ref	**Surfacing Repairs (ALL PROVISIONAL)**				
6.6	PSC8.5.1	**Standard crack sealing** but including cleaning the crack with compressed air, applying herbicide and/or aggregate as needed, priming and sealing then rolling as required. Sealant and prime to be in accordance with Cl A8.5.5.2 or Colseal SBR latex modified mineral filled bitumen emulsion cold pour crack sealant or equal approved.	m	500		
	PSC8.6.1	**Geosynthetic crack sealing** but including cleaning cracks with compressed air, applying herbicide as needed, priming and sealing then rolling as required. Sealant to be Colseal SBR latex modified mineral filled bitumen emulsion cold pour crack sealant or equal approved. Geosynthetic to be Sealmac by Kaytech applied in accordance with the manufacturers' specification, or equal approved.				
6.7	PSC8.6.1.1	Sealing cracks with 200mm wide geosynthetic and sealant as specified in Cl A8.6.5.1	m	200		
6.8	PSC8.6.1.2	Sealing cracks with geosynthetic crack sealing over area as specified above and Cl A8.6.5.1	m2	100		
6.9	PSC8.8.2.1	Excavation in existing pavements for patching or repair. To include for saw cutting and all asphalt, granular material and cemented layer removal as instructed on site for all areas of repair.	m3	80		
		SECTION 6 : TOTAL TO SUMMARY			**R**	

SECTION 7 : GABIONS & PITCHING

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
	SABS 1200DK : GABIONS & PITCHING					
	PSDK.8.2.2	**Gabions**				
7.1		a) to drains and headwalls : 1m^3 gabions with 2,5mm diameter wire galvanised & PVC coated 80 x 100mm mesh. Inclusive of all excavation & surface preparation. (Provisional).	m3	20		
7.2		b) to drains and headwalls: Reno mattress 6m x 2m x 0,3m thick with 2,5mm diameter wire galvanised & PVC coated 80x100mm mesh. Inclusive of all excavation & surface preparation. (Provisional).	m3	20		
7.3		c) to drains: Reno mattress 6m x 2m x 0,17m thick with 2,5mm diameter wire galvanised & PVC coated 80x100mm mesh. Inclusive of all excavation & surface preparation. (Provisional).	m3	20		
7.4	PSDK.8.2.4	a) **Type 3 Geofabric** (180g/m2) to subsoil drains etc. Inclusive of all overlaps and wastage.	m2	15 000		
7.4	PSDK.8.2.4	a) **Type 3 Geofabric** (180g/m2)n to cover leachate drainage layer. Supply onto site only and excluding any overlaps or wastage.	m2	40 000		
7.5	PSDK.8.2.4	b) **Type 5 Geofabric** (340g/m2) to gabions & drains etc. Inclusive of all overlaps and wastage.	m2	9 000		
7.6	PSDK.8.2.4	c) **1000g/m2 geotextile liner protection (prov).**	m2	200		
7.7	PSDK.8.2.4	**Grid reinforcement** (RockGrid PC 100/100 or equal approved) embedded in cemented sand Protection Layer. Supply and place. Provisional.	m2	10 000		
7.8	PSDK.8.2.5	**Stone pitching** for erosion control of stormwater. Inclusive of all backing & weepholes	m2	120		
7.9	PSDK.8.2.8	**Wind scatter fencing**. CCA (SANS CCA H4) treated poles to SANS 457 Class 6 (140-159mm diameter) up to 6m long including excavation to depths of up to 1.5m and backfilling with 10MPa concrete measured elsewhere or as approved.	No.	20		
7.10	PSDK.8.2.9	**Wind scatter fencing**. Shadecloth (20% typically), bird net or netting of suitable strength for wind scatter fencing including supply and installation with fully galvanised steel straining wires (3.15mm diameter to SANS 675) as needed on treated poles up to 5m high. Measured from ground level to the top of the poles excluding any overlaps and wastage.	m2	1 000		
		SECTION 7 : TOTAL TO SUMMARY			**R**	

SECTION 8 : CONCRETE WORK

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
	SABS 1200G : CONCRETE WORK					
		SCHEDULED REINFORCEMENT ITEMS				
8.1	PSG.8.3.1	Steel bars - mild, high tensile or welded mesh	t	5.0		
	PSG.8.4	**SCHEDULED CONCRETE ITEMS**				
8.2	G.8.4.2	Blinding concrete. 10MPa strength	m3	5		
8.3	G.8.4.3	Concrete Grade 20/19 to pipe encasement	m3	5		
8.4	PSG.8.4.3.1	Concrete "V" and trapezoidal type drains 25/19 concrete. Approx. 0,15m3/m but varies.	m3	225		
8.5	PSG.8.4.3.2	**Concrete.** Grade 30/19 concrete inc formwork, finishes, curing and jointing to non standard sewer & stormwater structures, drain junctions and outlets.	m3	10		
8.6	PSG.8.4.3.2	**Concrete.** Grade 35/19 concrete inc formwork, finishes, curing and jointing. 150 to 350mm thick. Generally paving for roadways and storage areas.	m3	1 420		
8.7	PSG.8.4.3.2	**Concrete.** Grade 35/19 concrete inc formwork, finishes, curing and jointing. 150 to 350mm thick. Generally washbay, workshop floor and foundations.	m3	80		
8.8	PSG.8.4.3.2	**Concrete.** Grade 30/19 concrete inc **all formwork**, boxing out, finishes and curing. 150 to 350mm thick in **bases and walls for transfer facility**.	m3	50		
8.9	PSG.8.4.3.3	Liner reinforcement ribs. 15MPa concrete, generally 500mm wide and 150mm thick.. Placement on slopes 1v:5h but up to approximately 1v:3h.	m3	10		
8.10	PSG.8.4.4	**Protective screed**. Multi Armour **100** or equal approved. Supply, lay in accordance with manufacture's recommendations and finish surface with power float. **Skip area etc**.	m2	6 150		
8.11	PSG.8.4.4	**Protective screed**. Multi Armour **120** or equal approved. Supply, lay in accordance with manufacture's recommendations and finish surface with power float. **Workshop areas**.	m2	350		
		SECTION 8 : TOTAL TO SUMMARY			**R**	

SECTION 9 : SEWERS

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
	SABS 1200LD : SEWERS					
	PSLD.8.2.1	***Supply and lay Class 34 HD uPVC pipe***				
9.1		b) 160mm diameter.	m	-		
	PSLD.8.2.1	Supply and lay **PE 100 SDR 17 PN 10 HDPE pipe** in the following sizes inclusive of fusion welding, bends, joints and T pieces. Generally as gravity leachate collectors.				
9.2		50mm OD solid wall Monitoring drains etc	m	600		
9.3		90mm OD solid wall	m	300		
9.4		160mm OD solid wall (prov)	m	1 100		
9.5		250mm OD solid wall	m	900		
		Supply and lay **PE 100 SDR 9 PN 20 HDPE pipe** in the following sizes inclusive of fusion welding, bends, joints and T pieces. Generally as gravity leachate collectors.				
9.6		90mm OD solid wall	m	100		
9.7		200mm OD solid wall	m	100		
9.8		200mm OD perforated 4% min. open area.	m	200		
	PSLD.8.2.3	***Manholes***				
9.9		Circular precast concrete 1000mm nominal diameter inclusive of Type 2 circular heavy duty concrete covers and frames. All Bituseal painted. 0 to 2,0m deep maximum.	No.	12		
9.10	LD.8.2.9	**Marker posts**; 1,2m long precast concrete, painted	No.	300		
9.11	PSLD.8.2.13	Valves for up to 250mm OD HDPE piping	No.	3		
9.12	PSLD.8.2.14	Connecting into existing leachate sewer systems, excluding piping & manholes but all cutting, jointing and making good.	No.	2		
9.13	PSLD.8.2.15	Standpipe for leachate or water discharge to tanker	No.	1		
9.14	PSLD.8.2.16	Conservancy tank as per detail.	No.	2		
9.15	PSLD.8.2.17	Silt, oil & grease trap as per detail.	No.	1		
9.16	PSLD.8.2.18	Cleaning of existing sewer lines including all manholes & chambers 110mm to 305mm diameter using approved pressure jet equipment.	m	200		
9.17	PSLD.8.2.19	Tankering of leachate from the existing storage ponds on site to the Municipal Southern Wastewater Treatment Works at Merebank. Provisional.	m^3	500		
		SECTION 9 : CARRIED FORWARD			**R**	

SECTION 9 : SEWERS

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
	SABS 1200LD : SEWERS					
		SECTION 9 : BROUGHT FORWARD				
		WATER STORAGE RESERVOIR				
9.20	PSLD.8.2.20	Nominal **60m3 tank**, roofed with all panels and roof of Zincalume coated steel to SANS 9364 suitable for use in the coastal environment or Grade 316 stainless steel (ASTM A240). Bolts hot dip galvanised to SANS 121. Dome roof to be self supporting. Tank to have wind girts as needed and fixed access ladder with safety cage, platform, access hatch and hand rails, all suitably corrosion protected. Level indicator and ventilation to be provided. (ATS FlexiTank systems AluZinc tank or equal approved). Tank to be lined with UV stabilised PVC liner 1000g/m2 minimum (or equal approved) as specified by the manufacturer.	No.	1		
9.21	PSLD.8.2.21	**Tank penetrations** inlet, outlet & dump drain. All components to be hot dip galvanised and gaskets to be neoprene or similar. Nominal maximum diameter 100mm (101.6mm), flanges to SABS 1123. Flanged each side or nozzle and strainer for inlet and outlet respectively. All to Engineers approval.	No.	5		
9.22	PSLD.8.2.22	**Piping.** Nominal diameter up to 100mm (101.6mm), flanges to SABS 1123 all hot dip galvanised to relevant SANS specification. Including flanges, bends and/or other couplings, bowser supports and adaptors.	m	50		
9.23	PSLD.8.2.23	**Valves.** Minimum hot dip galvanised with body & stainless steel Grade 316 blade, knife gate valves, PTFE O rings and seta, manual, nominal diameter up to 100mm, flanged. Including all fixings.	No.	4		
		SECTION 9 : TOTAL TO SUMMARY			**R**	

SECTION 10 : STORMWATER DRAINAGE

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
	SABS 1200LE : STORMWATER DRAINAGE					
	PSLE.8.2.1	**Supply & lay concrete pipe.**				
10.1		a) 450 diameter 100D spigot and socket.	m	48		
10.2		b) 600 diameter 100D spigot and socket.	m	64		
10.3		b) 1050 diameter 100D spigot and socket.	m	130		
	PSLE.8.2.1	***Subsoil pipes***				
		a) Perforated "Drainex" pipe or equal approved to subsurface drains.				
10.4		i) 110mm diameter DN 110	m	2 000		
10.5	PSLE.8.2.8	a) Supply & install **manholes,** kerb inlets or catchpits for up 600mm diameter pipe. Heavy duty concrete covers, max. 2m deep (prov.). Including low flow detail in base.	No.	12		
10.6	PSLE.8.2.8	a) Supply & install **manholes,** kerb inlets or catchpits for up 1 200mm diameter pipe. Heavy duty concrete covers, max. 2m deep (prov.). Including low flow detail in base.	No.	2		
10.7	PSLE.8.2.8	b) Inlet or outlet headwalls for up to 1200mm diameter pipe or smaller, and from open drains. All inclusive of excavation, reinforced concrete base, brick walls and trimming and grouting of pipework.	No.	6		
10.8	PSLE.8.2.14	Brickwork 230mm thick.	m2	20		
10.9	PSLE.8.2.14	Brickwork 345mm thick.	m2	20		
10.10	PSLE.8.2.15	Cleaning of existing stormwater piping, manholes & chambers using approved pressure jetting equipment or other approved means, including emptying / de silting etc at the manholes. All removed material to be disposed of on the landfill as indicated, Size 450mm to 1100mm diameter.	m	400		
		SECTION 10 : TOTAL TO SUMMARY			**R**	

SECTION 10 : PARTICULAR SPECIFICATION : LINING SYSTEMS

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
		PARTICULAR SPECIFICATION : LINING SYSTEMS				
11.1	LGM 8.1	**Supply Geomembrane to GRI GM-13**. 1.5mm thick HDPE as approved. Supply to the site and store safely, for slope areas measured net, excluding all wastage, overlaps and welding requirements but including anchorage length and overlap with existing liner. Including for embossed texturing on both faces of the geomembrane.	m2	43 000		
11.2	LGM 8.2	**Installation of Geomembrane to GRI GM-13**. 1.5mm thick HDPE as approved. Completely install geomembrane on slopes of up to 1v:2.5h (generally 1v:3h max.). Slope area measured net, excluding all wastage, overlaps and welding requirements but including anchorage length and overlap with existing liner. Including for embossed texturing on both faces of the geomembrane.	m2	43 000		
11.3	LGM 8.3	Pipe penetrations through lining system.	No.	3		
11.4	LGC.8.1	**Geosynthetic Clay Liner (GCL).** Supply to the site and store safely in accordance with the project and manufacturer's specifications. Slope area measured net, excluding all wastage, and overlaps but including anchorage length and overlap with existing liner.	m2	43 000		
11.5	LGC.8.2	**Geosynthetic Clay Liner (GCL).** Completely install on slopes of up to 1v:2.5h (generally flatter). Slope area measured net, excluding all wastage, and overlaps but including anchorage length and overlap with existing liner.	m2	43 000		
11.5	LGM 8.5	Establishment of leak detection equipment, once off for dipole testing.	sum			
11.6	LGM 8.6	Leak detection of geomembrane lining by dipole in accordance with ASTM D7007.	m2	43 000		
11.7	PSA.8.5 (b) 1)	Provisional sum for specialist testing on the liner components as directed by the Engineer.		Prov sum		R45 000.00
11.8		Overheads, charges & profit on item above	%	R 45 000.00		
		SECTION 11 : TOTAL TO SUMMARY			**R**	

SECTION 12 : PARTICULAR SPECIFICATIONS : DAYWORKS

Item	Payment Ref	Description	Unit	Quantity	Rate	Amount
		PARTICULAR SPECIFICATIONS : DAYWORKS				
		LABOUR				
12.1	PAA-5.1	Unskilled workers	hr	45		
12.2	PAA-5.1	Skilled workers (artisans)	hr	45		
12.3	PAA-5.1	Operators & drivers	hr	36		
12.4	PAA-5.1	Foreman	hr	45		
12.5	PAA-5.1	Gang Supervisor	hr	45		
		CONSTRUCTIONAL PLANT				
12.6	PAA-5.2	Lowbed (40t capacity)	km	500		
12.7	PAA-5.2	Bulldozer & ripper (Cat D5 to D6)	hr	36		
12.8	PAA-5.2	Grader (Cat 140G)	hr	9		
12.9	PAA-5.2	Front-end-loader 2.5m3 bucket	hr	27		
12.10	PAA-5.2	Front-end-loader 4m3 bucket	hr	27		
12.11	PAA-5.2	Tracked excavator (20t - 22t)	hr	45		
12.12	PAA-5.2	Tracked excavator (30t)	hr	18		
12.13	PAA-5.2	Tractor-loader backhoe (TLB)	hr	36		
12.14	PAA-5.2	Pedestrian Roller (Bomag 90)	hr	24		
12.15	PAA-5.2	Vibratory roller (8t - 10t)	hr	9		
12.16	PAA-5.2	Compressor & all tools (250cfm)	hr	9		
12.17	PAA-5.2	$6m^3$ tip truck	hr	27		
12.18	PAA-5.2	$10m^3$ tip truck	hr	45		
12.19	PAA-5.2	All terrain dumptruck (ADT) 30t capacity	hr	45		
12.20	PAA-5.2	Crane truck; 10t capacity	hr	24		
12.21	PAA-5.2	Light delivery vehicle	km	200		
12.22	PAA-5.2	Water Tanker 8 000 litres to 12 000 litres	hr	120		
12.23	PAA-5.2	Other : Contractor to specify				
		SECTION 12 : TOTAL TO SUMMARY			**R**	

ETHEKWINI MUNICIPALITY CLEANSING & SOLID WASTE

CONTRACT WS 7638

LOVU LANDFILL: CONSTRUCTION OF CELL 6 AND ANCILLARY WORKS

SUMMARY OF BILL OF QUANTITIES

SECTION	DESCRIPTION	AMOUNT
1	SCHEDULED FIXED CHARGE & VALUE RELATED ITEMS	
1	SCHEDULED TIME-RELATED ITEMS	
1	SUMS STATED PROVISIONALLY BY ENGINEER	
2	SITE CLEARANCE	
3	EARTHWORKS	
4	EARTHWORKS : PIPE TRENCHES	
5	EARTHWORKS : ROADS, SUBGRADE	
6	ROADS : SURFACING	
7	GABIONS, PITCHING INCLUDING GEOFABRIC	
8	CONCRETE WORK	
9	MEDIUM PRESSURE PIPELINES & SEWERS	
10	STORMWATER DRAINAGE	
11	PARTICULAR SPECIFICATIONS: LINING SYSTEMS	
12	PARTICULAR SPECIFICATIONS: DAYWORKS	
SUB TOTAL		
ADD VALUE ADDED TAX	15%	
TOTAL CARRIED TO FORM OF OFFER AND ACCEPTANCE		

PART C3: SCOPE OF WORK

C3.1: PROJECT DESCRIPTION AND SCOPE OF CONTRACT

C3.1.1 Description of Works

The Contract is for the construction of a sixth landfill cell, Cell 6, Leachate Storage Pond 3 and ancillary works for the Lovu Landfill site. The main parts of the envisaged work include:

a) careful relocation of identified indigenous plants from the area of the works.

b) clearing of other vegetation and removal of trees.

c) stripping of topsoil to stockpile for re-use and clearing of waste for the landfill liner overlaps with the existing Cell 3 and Cell 5.

d) bulk earthworks in materials ranging from soft clayey soils to soft rock in order to prepare for the new cell, the leachate storage pond and other works including, but not limited to, gravel roads, drains and pipelines.

e) base layers, compacted clay liner (provisionally), GCL and geomembrane liner and some geogrid for Cell 6 and Leachate Storage Pond 3.

f) construction of liner protection layers, generally stabilised sand then the crushed rock aggregate leachate drainage layers for Cell 6, geotextiles and appurtenant works together with the pipework for the leachate detection and under drainage layers for Cell 6 and the Leachate Storage Pond 3.

g) construction of sundry subsoil drains, blanket drains and pipework as may be needed.

h) construction of concrete vee and trapezoidal drains as well as ancillary brickwork structures.

i) construction of leachate, stormwater and monitoring manholes (including pipework and valves) and other structures.

j) stormwater drainage (piping headwalls and manholes).

k) Gabion walling and protection works.

l) Catchwater drains and berms, some on the landfill.

m) Ancillary works are significant and include the relocation of the existing workshop, provision of water and electricity services, repair work at Cell 4, a possible new small vehicle transfer facility, road repairs, provision of a new 60m^3 water reservoir, reconstruction and extension of site gravel and asphalt roads, access roads onto the landfill, temporary clay capping of waste on the landfill, possible tankering of leachate off the site and pumping of leachate from LP 3 to irrigation or the Leachate Treatment Plant, extensions and new concrete paving and new effluent control facilities (leachate and contaminated stormwater pumping).

The site is an operational landfill and the Contractor is to take cognisance of the fact that landfill operations will be ongoing during the Works and must allow for this in all the work to be undertaken and without interfering with any landfilling operations.

C3.1.2 Description of Site and Access

The site of the works is the DSW Lovu Landfill located some 3km west and inland of the N3 at Illovo Beach. Access is off the N3 onto the R603 then P197-3 south across the Lovu River or off the N2 onto the R578 then north on the P197-3 for around 2km before turning west onto an existing gravel road, the A876. The site infrastructure is some 500m along the gravel road and Cells 1, 2 and 3 are immediately north of this infrastructure. Cell 6 is generally north west of the existing lined landfill cells and north of the entrance and weighbridges etc. The new leachate pond No. 3 is in the valley line downstream of the recently completed contaminated stormwater pond and near the south eastern boundary of the landfill.
A locality plan is included in Section C4.1.

C3.1.3 Nature of Ground and Subsoil Conditions

A summary report covering the geotechnical conditions underlying the site is available from the Engineer and the profiles of investigation pits done in the area of Cell 6 are attached herewith. Generally, the area is underlain by Pietermaritzburg Shale bedrock with some minor dolerite intrusions. Some hard rock may be encountered in the valley lines, particularly in the base area of Leachate Pond 3. The bedrock is overlain by between 1m to 4m of transported and residual soil. This soil is expected to be primarily fine grained (silt or clay) of indifferent to poor quality following roadwork's specifications (TRH 14).

In the valley lines the soils may be soft and wet with groundwater being encountered. Temporary and permanent subsoil drainage is required in these areas.

C3.2: PROJECT SPECIFICATION

PREAMBLE

In the event of any discrepancy between a part or parts of the Standard or Particular Specifications and the Project Specification, the Project Specification shall take precedence. In the event of a discrepancy between the Specifications, (including the Project Specifications) and the drawings and / or the Bill of Quantities, the discrepancy shall be resolved by the Employer's Agent before the execution of the work under the relevant item.

C3.2.1 GENERAL

PS.1 PROGRAMME, METHOD OF WORK, AND ACCOMMODATION OF TRAFFIC

This Clause is to be read in conjunction with the provisions and obligations as contained in SANS 1921-1 and SANS 1921-2.

The site is an operational landfill and the Contractor is to take cognisance of the fact that landfill operations will be ongoing during the Works and must allow for this in all the work to be undertaken and without interfering with any landfilling operations.

PS.1.1 Preliminary Programme

The Contractor shall include with his tender a preliminary programme on the prescribed form (see T2.2: Preliminary Programme) to be completed by all Tenderers. The programme shall be in the form of a simplified bar chart with sufficient details to show clearly how the works will be performed within the time for completion as stated in the Contract Data.

Tenderers may submit tenders for an alternative Time for Completion in addition to a tender based on the specified Time for Completion. Each such alternative tender shall include a preliminary programme similar to the programme above for the execution of the works, and shall motivate his proposal clearly by stating all the financial implications of the alternative completion time.

The Contractor shall be deemed to have allowed fully in his tendered rates and prices as well as in his programme for all possible delays due to normal adverse weather conditions (refer to Clause 5.12.2.2) and special non-working days (refer to Clause 5.1.1.1) as specified in the in the Contract Data.

PS.1.2 Programme in Terms of Clause 5.6 of the General Conditions of Contract

It is essential that the construction programme, which shall conform in all respects to Clause 5.6 of the General Conditions of Contract, be furnished within the time stated in the Contract Data (refer to Clause 5.3.1/2).

The preliminary programme to be submitted with the tender shall be used as basis for this programme.

The Tenderer's attention is drawn to the fact that a number of factors will affect the programming of and method of carrying out the works. The more important of these are:

a) The time required to comply with the requirements to subcontract 30% of the work to local CPG subcontractors.

b) Adherence to the safety aspects of working on a landfill site.

c) Vehicular access within the landfill needs to be maintained and this may require traffic controls, deviations and the planning of the works, particularly the roadworks and concrete drain repairs.

d) Traffic restrictions. There are no specific traffic restrictions other than noting that access for vehicles disposing of refuse and other tasks will be utilising the roads and other areas within the site

e) Subsoil drainage will need to be installed in the valley lines prior to earthworks and liner layerworks being undertaken

f) It may be expected that the earthworks will be in clay soil that may be of less than G10 quality following TRH 14 and require experience to achieve the compaction levels specified.

g) Some of the work involves operations on slopes of up to 1v in 3h (although generally 1v : 5h) and with slope distances of up to some 150m.

h) To protect the GCL the geomembrane and protective layer must be placed daily over the section of GCL laid that day.

i) Work on the layers above the liner elements is to be undertaken using light equipment and must follow procedures which must satisfy the Engineer that they will not damage the liner.

j) The Tenderer must make themselves familiar with the procedures and methods required to construct and/or lay the CCL, GCL and HDPE liners. Factors that must be considered are:

   (1) rain
   (2) wind
   (3) temperature

k) For stability it is necessary that the construction of the liner layers must extend upwards from the basal area.

l) Stormwater drainage must be carefully controlled during the construction phase. Runoff must be directed away from the area of the works and the liner anchor trenches must be free draining at all times.

m) Vehicular access to the disposal areas, infrastructure, leachate treatment plant and cover stockpile areas, as well as all other access required by DSW's operations is to be maintained.

n)

o) There will be other traffic close to the works, primarily waste disposal traffic and the Contractor's work will need to be programmed to interface with these operations.

Those known, existing services in the area of the works have been depicted on the contract drawings. It is evident, however, that the status of existing service records as far as can be ascertained might not reflect the actual situation in the field. **As such, due allowance has been made in the Bill of Quantities for the proving of services in all areas and where directed by the Engineer.**

PS.1.3 Requirements for Accommodation of Traffic

PS.1.3.1 General

Accommodation of traffic, where applicable, shall comply with SANS 1921-2: 2004: Construction and Management Requirements for Works Contracts, Part 2: Accommodation of Traffic on Public Roads occupied by the Contractor. The Contractor shall obtain this specification from Standards South Africa if accommodation of traffic will be involved on any part of the construction works.

Clause 4.10.4 of SANS 1921-2: 2004 shall be replaced with the following:

"Road signs and markings shall comply with the requirements of the "SADC Road Traffic Signs Manual - Volume 2: Roadworks Signing".

The site is an operational landfill so the Contractor should make his own access tracks to the Works and not interfere with any landfilling operations.

PS.1.3.2 Basic Requirements

The travelling public shall have the right of way on public roads, and the Contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard on the road.

The Contractor shall ensure that all road signs, barricades, delineators, flagmen and speed controls are effective, and that courtesy is extended to the public at all times.

Failure to maintain road signs, warning signs or flicker lights, etc, in a good condition shall constitute ample reason for the Employer's Agent to suspend the work until the road signs, etc, have been repaired to his satisfaction.

The Contractor may not commence constructional activities affecting existing roads before adequate provision has been made to accommodate traffic in accordance with the requirements of this document and the South African Road Traffic Signs Manual.

The Contractor shall construct and maintain all temporary drainage works necessary for temporary deviations. The Contractor shall ensure that the existing property accesses are maintained at all times. Where necessary the Contractor shall make allowance in the rates for completing the work required to the accesses out of normal hours.

PS.1.3.3 Traffic Safety Officer

Where warranted by traffic conditions on or near the site, the Contractor shall nominate a suitable member of his staff as traffic safety officer to be responsible for the arrangement and maintenance of all the measures for the accommodation of traffic for the duration of the project. Duties of the traffic safety officer shall be in compliance with the Occupational Health and Safety Act 1993 and the Construction Regulations 2014.

PS.1.3.4 Payment

The Contractor's tendered rates for the relevant items in the Bill of Quantities shall include full compensation for all possible additional costs which may arise from this, and no claims for extra payment due to inconvenience as a result of the modus operandi will be considered.

PS.1.3.5 Pedestrian Movement

The Contractor shall make provision for accommodating all required pedestrian movements in the area of the works. Allowance shall be made in the relevant rates for any barricades and signs required.

PS.1.3.6 Temporary Reinstatement

Provided always that if in the course or for the purpose of the execution of the works or any part thereof any road or way shall have been broken up, then notwithstanding anything herein contained:

(a) if the permanent reinstatement of such road or way is to be carried out by the appropriate authority or by some person other than the contractor (or any subcontractor to him), the contractor shall at his own cost and independently of any requirement of or notice from the Engineer be responsible for the making good of any subsidence or shrinkage or other defect, imperfection or fault in the temporary reinstatement of such road or way, and for the execution of any necessary repair or amendment thereof from whatever cause the necessity arises, until the end of the period of maintenance in respect of works beneath such road or way until the authority or other person as aforesaid shall have taken possession of the site for the purpose of carrying out permanent reinstatement (whichever is the earlier), and shall indemnify and save harmless that Council against and from any damage or injury to the Council or to third parties arising out of or in consequence of any neglect or failure of the Contractor to comply with the foregoing obligations or any of them and against and from all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

(b) where the authority or person as aforesaid shall take possession of the site as aforesaid in sections or lengths, the responsibility of the contractor under paragraph (a) of this sub-clause shall cease in regard to any such section or length at the time possession thereof is so taken, but shall during the continuance of the said period of maintenance continue in regard to any length of which possession has not been taken and the indemnity given by the contractor under the said paragraph shall be construed and have effect accordingly.

PS.2 SERVICES

This Clause is to be read in conjunction with the provisions and obligations as contained in SANS 1921-1 and SANS 1921-2.

PS.2.1 Existing Services

The Tenderer's attention is drawn to the numerous existing services in the area. Although every effort has been made to depict these services accurately the positions shown must be regarded as approximate.

The following services are known to exist:

- 132 kV and 275kV overhead electricity transmission lines and towers operated by Eskom and eThekwini Electricity;
- electrical, water and sewer services into and surrounding the administration offices, workshop and weighbridges;
- electrical cabling supplying the leachate treatment plant (LTP) inside the landfill along the southern boundary and extending north to the plant.
- electrical cable and water piping along the southern edge of the landfill.
- Water piping from BH 2 to the offices and washbay.
- leachate pipes between Cells 1 to 4 and the leachate storage ponds.
- Electronic temperature measurement systems near Cell 5.
- leachate and leakage monitoring manholes from Cells 1 to 5.

PS.2.2 Proving Underground Services

This clause must be read in conjunction with Clause DB.5.1.2, the requirements of which shall be extended to cover all earthworks operations whether for trenching or bulk earthworks, in the vicinity of underground services.

It is stressed that all services in a particular area must be proven before commencing work in that area.

Insofar as bulk earthworks are concerned, where services are indicated on the drawings or where from site observations can reasonably be expected that such services are likely to exist where excavations are to take place, the Contractor shall without instructions from the Employer's Agent carefully excavate by hand to expose and prove their positions.

The cost of the proving trenches is to be included in the work covered by Clause DA.8.3.

When a service is not located in its expected position the Contractor shall immediately report such circumstances to the Employer's Agent who will decide what further searching or other necessary action is to be carried out and shall instruct the Contractor accordingly. The cost of this additional searching shall be to the Council's cost and shall be paid for under DB.8.19 - Proving Existing Services.

Should any service be damaged by the Contractor in carrying out the works and should it be found that the procedure as laid down in this clause has not been followed then all costs in connection with the repair of the service will be to the Contractor's account.

When electrical cables are not in the positions shown on drawings of eThekwini Electricity and cannot be found after proving trenches have been put down, assistance may be obtained by calling an official of the Works Branch on Telephone No. 311-1111 during office hours, or by contacting Control on Telephone No. 305-7171 after hours.

It should be noted that 33,000 Volt and 132,000 Volt cables may only be exposed by the eThekwini Electricity's personnel. The cables are usually protected by concrete covering slabs, and therefore if the slabs are inadvertently exposed, excavation work must stop, and the eThekwini Electricity shall be contacted immediately on the above telephone numbers.

Proving of services shall be completed at least two weeks in advance of the actual programmed date for commencing work in the area. The position of these services located must be co-ordinated and levelled by the Contractor, and the information given in writing to the Employer's Agent's Representative.

The requirements of this clause do not relieve the Contractor of any obligations as detailed in the Conditions of Contract or under Clause 4.17 of SANS 1921-1.

PS.2.3 New Services and Relocation of Existing

This clause shall be read in conjunction with Clause PS.1.

New services are either to be installed by the Contractor as part of the contract or by others during the contract period. In the latter case excavation and subsequent backfilling of the trench from the top of the bedding layer shall generally be carried out by the Contractor.

Relocation of services shall generally be carried out by the relevant services organisation. Generally their work shall include the excavating and bedding the service which will include backfilling to a depth of approximately 300 mm above the service. The remainder of the backfilling shall be carried out by the Contractor.

Generally work shall only commence on the installation of new services once the bulk earthworks have been completed and roughly trimmed to level along a substantial portion of the services route. In addition no sidewalk, verge, median or island shall be surfaced or topsoiled until all work on the services has been completed.

Services affected by the contract are described as follows:

- PS.3: Watermains;
- PS.4: Sewers;
- PS.5: Stormwater;
- PS.6: Electrical Cables / Lighting;
- PS.7: Telkom / Neotel;
- PS.8: CCTV;

Further to the above, tenderers are referred to the services drawing and are to note that several minor cables / pipes may be encountered during excavation works which may require to be relocated to some extent. It is anticipated that the two week period required under PS.2.2 will allow sufficient time for these relocations.

PS.2.4 Accommodation of Services

Further to Clauses PS.1 and PS.2 of this specification, tenderers are to note that allowance must be made under this item and / or the appropriate rates, for all costs incurred as a result of complying with these clauses. It shall also cover liaison with the services organisations and accommodation of their work gangs / contractors on site.

PS.3 WATERMAINS

PS.3.1 General

No water mains are required to be installed as part of this contract.

PS.3.2 Water Main Valve Access

Due to the dangerous situation occurring when water main valves are covered over, the Contractor shall maintain access to all water main valves at all times. During asphalt layer work, after each pass by the paving machine, the valves shall be exposed and access maintained in a safe condition.

Whatever method the Contractor chooses to use for this work, the cost of raising the valves from existing level to ultimate level shall be paid only once, irrespective of the number of times the valve is uncovered. Spacer rings required for the height adjustment of valve covers shall be supplied by the Water and Sanitation Unit. Tolerances on valve cover levels shall be as specified in clause PH.6.5. Before final setting in position of valve covers the Contractor shall liaise with the Employer's Agent regarding the direction in which covers shall be placed.

PS.3.3 Restriction on Compactive Equipment

The Contractor is to note that existing watermains traverse the site of the works and special care is to be taken in close proximity to these mains and connections. The existing mains and connections shall be proved on site by the Contractor prior to any construction work commencing in the vicinity of the watermains.

Under no circumstances will heavy road-making equipment, other heavy plant or vibratory compaction equipment be permitted to operate within 800 mm vertically or horizontally of the existing mains or connections. The permissible compaction plant within this restricted area shall be the equivalent of a "Bomag 90" under static compaction, or similar approved plant. When the roadworks are far enough advanced to provide a minimum of 800 mm cover to the existing mains, the above restriction will fall away.

The Contractor is to take cognisance of the above requirements when entering rates in the Bill of Quantities and in the programming of the works. No claim for additional payment based on the inability to use plant as a result of the requirements of this clause will be accepted. The Contractor will be held liable for any costs should the watermain or electrical cables be damaged during construction of the road.

PS.4 SEWERS

No domestic sewer reticulation is envisaged as part of this contract.

PS.4.1 Blockage of Foul Water Sewers

The Contractor shall be responsible for ensuring that cementitious sludge, sand and rubble from the works do not enter the foul water reticulation system. The Contractor shall be liable for any costs incurred by the Council or others as a result of blockages in the reticulation system attributed to failure to comply with the above requirement.

PS.5 STORMWATER

Stormwater piping and drains are to be built as part of the works. Some areas may have limited access.

PS.5.1 Blockage Stormwater Sewers

The Contractor shall be responsible for ensuring that cementitious sludge, sand and rubble from the works do not enter the stormwater reticulation system. The Contractor shall be liable for any costs incurred by the Council or others as a result of blockages in the reticulation system attributed to failure to comply with the above requirement.

PS.6 ELECTRICAL PLANT

Limited electrical plant (leachate pumps) is required to be installed as part of this contract.

PS.6.1 General

Various types of electrical cables including high voltage, low voltage, street lighting and domestic connection cables are affected by the contract. The laying, relocation and jointing of all cables will be carried out by eThekwini Electricity's work gangs, or agents appointed by them, whilst the excavation and backfilling forms part of this contract. Close liaison will therefore be necessary with eThekwini Electricity throughout the contract.

PS.6.2 Street Lighting

The existing lighting will be removed in stages and replaced in the centre median / intersection corners. Relocation will take place during this contract and be executed by eThekwini Electricity or their agents. It is a requirement that the street lighting be operational at all times.

PS.6.3 MV / LV Cables

Certain MV / LV cables are to be replaced within the contract area (see drg xxxxxxxxA0). The actual cable work associated with this relocation and / or replacement of these cables will be carried out by eThekwini Electricity and it is stressed that the two week period referred to in Clause PS.2 is the minimum period required to enable eThekwini Electricity to be on site timeously.

PS.6.4 Relocation of Existing Services

Should it be necessary to adjust the line, level and / or position of any service not catered for in the contract to enable the construction to proceed the Contractor shall on no account effect such adjustment himself but shall notify the Engineer who will arrange for the work to be carried out at no cost to the Contractor.

PS.7 TELKOM S.A. LIMITED / NEOTEL PLANT

No work to Telkom / Neotel Plant is envisaged.

PS.8 CCTV PLANT

No work to CCTV Plant is envisaged.

PS.9 MANAGEMENT OF THE ENVIRONMENT

The Contractor shall pay special attention to the following:

PS.9.1 Natural Vegetation

The Contractor shall confine his operation to as small an area of the site as may be practical for the purpose of constructing the works.

Only those trees and shrubs directly affected by the works and such others as the Employer's Agent may direct in writing shall be cut down and stumped. The natural vegetation, grassing and other plants shall not be disturbed other than in areas where it is essential for the execution of the work or where directed by the Engineer.

PS.9.2 Fires

The Contractor shall comply with the statutory and local fire regulations. He shall also take all necessary precautions to prevent any fires. In the event of fire the Contractor shall take active steps to limit and extinguish the fire and shall accept full responsibility for damages and claims resulting from such fires which may have been caused by him or his employees.

PS.9.3 Environmental Management Plan

In addition to the above, all requirements according to the Environmental Management Plan as detailed in C3.4: Particular Specifications, will be adhered to.

PS.10 OCCUPATIONAL HEALTH AND SAFETY

PS.10.1 General Statement

When considering the safety on site the Contractor's attention is drawn to the following:

GENERAL HEALTH AND SAFETY

In addition to the statutory requirements of the Occupational Health and Safety Act it should be noted that :

The Contractors attention is drawn to the flammable, explosive and asphyxiative nature of landfill gas resulting from the de-composition of waste. Landfill gas can migrate through ground and the Contractor shall take all necessary precautions to ensure the safety of his/her personnel and all third parties from the dangers of landfill gas. Landfill gas is particularly dangerous in enclosed spaces (manholes etc.) The Contractor's personnel shall not enter the operational areas and contact with refuse and leachate should be kept to a minimum. No scavenging of refuse is allowed. Workmen are to be provided with the appropriate safety clothing and equipment.

In the vicinity of the landfill body, and in particular, within any excavations, flammable and poisonous "landfill gas" may be present. The flammable constituent of the gas is methane. Special care and precautions must be taken where men may work with their heads below the general surface and in excavation.

The lighting of fires is strictly prohibited, due to the possible presence of landfill gas, and smoking on site will also be prohibited. The use of naked flames must only take place under safe conditions. Smoking shall only be allowed in designated safe areas.

The Contractor's attention is also drawn to the possible hazards to health of waste and contaminated water, and adequate health and safety precautions shall be taken.

The Contractor shall make all Sub-Contractors, visitors, third parties and agents aware of the hazards of landfill gas on the site, and shall ensure that they take the necessary precautions.

The Contractor shall take adequate Health and Safety precautions when working in and adjacent to waste. The wastes placed in the in-filled areas are reported to have been predominantly municipal wastes (domestic, commercial, industrial and inert). However, the Contractor should also make provision for the fact that any landfill may contain small quantities of hazardous substances other than those permitted under a site licence. No guarantee can be given that small quantities of other substances, including hazardous industrial waste, have not been concealed within other wastes and disposed without knowledge of the site operator.

It is a requirement of this contract that the Contractor shall provide a safe and healthy working environment and to direct all his activities in such a manner that his employees and any other persons, who may be directly affected by his activities, are not exposed to hazards to their health and safety. To this end the Contractor shall assume full responsibility to conform to all the provisions of the Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the OHSA 1993 Construction Regulations 2014 issued on 7 February 2014 by the Department of Labour.

For the purpose of this contract the Contractor is required to confirm his status as mandatory and employer in his own right for the execution of the contract by entering into an agreement with the Employer in terms of Section 37(2) of the Occupational Health and Safety Act.

PS.10.2 Health and Safety Specifications and Plans to be submitted at tender stage

PS.10.2.1 Employer's Health and Safety Specification

The Employer's Health and Safety Specification is included in C3.4: Particular Specifications.

PS.10.2.2 Tenderer's Health and Safety Plan

At tender stage only a brief overview of the tenderers perception on the safety requirements for this contract will be adequate. This will be attached to T2.2: Contractor's Health and Safety Plan.

Only the successful Tenderer shall submit a separate Health and Safety Plan as required in terms of Regulation 7 of the Occupational Health and Safety Act 1993 Construction Regulations 2014, and referred to in T2.2: Contractor's Health and Safety Plan.

The detailed safety plan will take into consideration the site specific risks as mentioned under PS.10.1 and must cover at least the following:

(i) A proper risk assessment of the works, risk items, work methods and procedures in terms of Regulations 9 to 29;

(ii) Pro-active identification of potential hazards and unsafe working conditions;

(iii) Provision of a safe working environment and equipment;

(iv) Statements of methods to ensure the health and safety of subcontractors, employees and visitors to the site, including safety training in hazards and risk areas (*Regulation 7)*;

(v) Monitoring health and safety on the site of works on a regular basis, and keeping of records and registers as provided for in the Construction Regulations;

(vi) Details of the Construction Supervisor, the Construction Safety Officers and other competent persons he intends to appoint for the construction works in terms of Regulation 8 and other applicable regulations; and

(vii) Details of methods to ensure that his Health and Safety Plan is carried out effectively in accordance with the Construction Regulations 2014.

The Contractor's Health and Safety Plan will be subject to approval by the Employer, or amendment if necessary, before commencement of construction work. The Contractor will not be allowed to commence work, or his work will be suspended if he had already commenced work, before he has obtained the Employer's written approval of his Health and Safety Plan.

Time lost due to delayed commencement or suspension of the work as a result of the Contractor's failure to obtain approval for his safety plan, shall not be used as a reason to claim for extension of time or standing time and related costs

A generic plan will not be acceptable.

PS.10.3 Cost of compliance with the OHSA Construction Regulations

The rates and prices tendered by the Contractor shall be deemed to include all costs for conforming to the requirements of the Act, the Construction Regulations and the Employer's Health and Safety Specification as applicable to this contract. Should the Contractor fail to comply with the provisions of the Construction Regulations, he will be liable for penalties as provided in the Construction Regulations and in the Employer's Health and Safety Specification.

Items that may qualify for remuneration will be specified in the Employer's Health and Safety Specification.

PS.11 SITE SECURITY

The Contractor shall, for the duration of the contract, provide sufficient security and watchmen to adequately ensure the safety and protection of the works, the Contractor's staff, including local labour and subcontractors, and all site plant and construction equipment required for the works.

Site Security, in conjunction with the SAPS (where necessary), shall be responsible for removal of disruptive elements, that may interrupt the progress of the contract through acts such as, but not limited to, intimidation, threats of disruption, violent disruption, or criminal and illegal activity by the local community or independent organisations or entities that may result in slowing down or partial or total stoppage of the works.

Payment for this item shall be made under Section 1, Part AB of the Bill of Quantities.

PS.12 PERFORMANCE MONITORING OF SERVICE PROVIDERS

The performance of service providers that have been selected to provide assistance in the provision of a municipal service, otherwise than in circumstances where Chapter 8 of the Municipal Systems Act applies, is required, by Section 116 of the Municipal Finance Management Act, to be monitored and reported on (see Cl.53 of the SCM Policy).

Appropriate key performance indicators (KPIs) for the contract must be set by the Municipality as a yardstick for measuring performance.

The following KPIs will be applicable to this contract:
(a) The requirements of Clause 1.2.3.2 as regards to the employment of Local Labour.
(b) The requirements of Clause 1.2.3.3 as regards to the Contractor Participation Goals.

C3.3: STANDARD SPECIFICATIONS

C3.3.1 The Specifications on which this contract is based are the SANS / SABS 1200 Series Standard Engineering Specifications (hereafter referred to as the Standard Engineering Specifications). This document is obtainable separately, and Tenderers shall obtain their own copies of the applicable Sections.

SABS 1200 A	:	GENERAL
SABS 1200 AB	:	ENGINEER'S OFFICE
SABS 1200 C	:	SITE CLEARANCE
SABS 1200 D	:	EARTHWORKS
SABS 1200 DB	:	EARTHWORKS (PIPE TRENCHES)
SABS 1200 DM	:	EARTHWORKS (ROADS, SUBGRADE)
SABS 1200 DK	:	GABIONS AND PITCHING
SABS 1200 G	:	CONCRETE
SABS 1200 GE	:	PRECAST CONCRETE
SABS 1200 M	:	ROADS (GENERAL)
SABS 1200 MF	:	BASE
SABS 1200 MH	:	ASPHALT BASE & SURFACING
SABS 1200 MK	:	KERBING AND CHANNELLING
SABS 1200 L	:	MEDIUM-PRESSURE PIPELINES
SABS 1200 LB	:	BEDDING (PIPES)
SABS 1200 LC	:	CABLE DUCTS
SABS 1200 LD	:	SEWERS
SABS 1200 LE	:	STORMWATER DRAINAGE

C3.3.2 AMENDMENTS TO THE STANDARD SPECIFICATIONS

INTRODUCTION

In certain clauses the standard, standardized and particular specifications allow a choice to be specified in the project specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternative or additional requirements applicable to this contract are contained in this part of the project specifications. It also contains additional specifications required for this particular contract.

The number of each clause and each payment item in this part of the project specifications consists of the prefix PS followed by a number corresponding to the number of the relevant clause or payment item in the standard specifications. The number of a new clause or payment item, which does not form part of a clause or a payment item in the standard specifications and which is included here, is also prefixed by PS, but followed by a new number which follows on the last clause or item number used in the relevant section of the standard specifications.

The Specifications on which this contract is based are the SANS / SABS 1200 Series Standard Engineering Specifications (hereafter referred to as the Standard Engineering Specifications). This document is obtainable separately, and Tenderers shall obtain their own copies of the applicable Sections.

SABS 1200 A	:	GENERAL
SABS 1200 AB	:	ENGINEER'S OFFICE
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SABS 1200 DM	:	EARTHWORKS (ROADS, SUBGRADE)
SABS 1200 DK	:	GABIONS AND PITCHING
SABS 1200 G	:	CONCRETE
SABS 1200 GE	:	PRECAST CONCRETE
SABS 1200 M	:	ROADS (GENERAL)
SABS 1200 MF	:	BASE
SABS 1200 MH	:	ASPHALT BASE & SURFACING
SABS 1200 MK	:	KERBING AND CHANNELLING
SABS 1200 L	:	MEDIUM-PRESSURE PIPELINES
SABS 1200 LB	:	BEDDING (PIPES)
SABS 1200 LC	:	CABLE DUCTS
SABS 1200 LD	:	SEWERS
SABS 1200 LE	:	STORMWATER DRAINAGE

PSA GENERAL

PSA 3 MATERIALS

PSA 3.1 Quality

All pipes, equipment and materials necessary for the Works should be provided with the SABS Mark of Approval where applicable. The Contractor shall furnish, at his own expense and without delay, such samples as are called for or may be called for by the Engineer, who may reject all materials or workmanship not corresponding with the approved sample.

Add the following new Subclause:

PSA 3.3 Ordering of Materials

The quantities set out in the Schedule of Quantities have been carefully determined from calculations based on data available at the time and should therefore be considered to be only approximate quantities. The liability shall rest entirely and solely with the Contractor to determine before ordering, the required types and quantities of the various materials required for the completion of the Works in accordance with the Specifications and the Drawings issued to the Contractor for construction purposes.

Any reliance placed by the Contractor on the estimated quantities stated in the Schedule of Quantities issued for Tendering purposes, shall be entirely at the Contractor's risk and the Employer accepts no liability whatever in respect of materials ordered by the Contractor on the basis of Tender Documents.

PSA 5.1 Survey

PSA 5.1.1 Setting Out of the Works

Although survey control pegs are available within the confines of the Site, and details of these will be provided to the successful Tenderer, the pegs are often disturbed or lost during normal daily operations.

The Contractor shall, thus, allow in the Tendered Sum for Setting out the Works in Section 1 of the Schedule of Quantities for supplying and placing the following:

(1) 5 No. x 1m long 15mm dia reinforcing bars to be struck into the ground and supported with concrete (300mm x 300mm x 300mm) at locations directed by the Engineer;

(2) accurately, by Class 1 traverse closure, co-ordinate the staked points which shall then be levelled;

(3) cast stainless steel tags into the concrete as permanent markers.

The Contractor shall, subsequent to constructing any portion of the Works, check line and level to ensure that the appropriate pegs have not been disturbed.

Additional costs of survey control as outlined above are to be included in the tendered rates in Section 1 of the Schedule of Quantities and no additional payment will be made.

Add the following new Subclause:

PSA 5.1.3 As Built Data

The Tenderer shall note the Lump Sum in Section 1: General of the Schedule of Quantities covering the submission of as built data.

During and on completion of the Contract, the Contractor is required to undertake an As-built survey of the Works, providing the following details:

a) invert levels of leachate drainage lines, stormwater manholes, etc;
b) installed services;
c) liner surface levels and anchor trenches;
d) stormwater drainage details;
e) subsoil drainage lines

The Completion Certificate shall not be issued unless the above information has been forwarded to the Engineer.

PSA 5.4 Protection of Overhead and Underground Services

The Contractor shall take all necessary steps to ascertain the location of existing services before commencing any section of the Works and shall exercise the greatest care when working in the vicinity of such services, as well as the existing liner under existing Cell 1 and, where applicable, informing the Engineer timeously of his intentions to do so.
The Contractor shall take all necessary steps to protect any existing services against damage which may arise as a result of his operations, including blasting, on site. The Contractor shall bear the cost of the repair of damage to any service and the possible existence of which could reasonably have been ascertained by him in good time. The costs associated with the proving and protecting of services shall be allowed for by the Tenderer under items already included in the Schedule of Quantities.

Where the Contractor is responsible for the cost of repairs carried out by the Employer or an outside authority, the costs will be recovered by means of a deduction from the Contractor's monthly Payment Certificates. The Employer will attend to the payment of monies due to outside authorities.

The following services are known to exist:

- 132 kV and 275kV overhead electricity transmission lines and towers operated by Eskom and eThekwini Electricity;
- electrical, water and sewer services into and surrounding the administration offices, workshop and weighbridges;
- electrical cabling supplying the leachate treatment plant (LTP) inside the landfill along the southern boundary and extending north to the plant.
- electrical cable and water piping along the southern edge of the landfill.
- Water piping from BH 2 to the offices and washbay.
- leachate pipes between Cells 1 to 4 and the leachate storage ponds.
- Electronic temperature measurement systems near Cell 5.
- leachate and leakage monitoring manholes from Cells 1 to 5.

The successful Tenderer shall take note that the statutory clearance requirements of the Operational Health and Safety Act must be adhered to at all times when crossing or working in the overhead transmission line servitude.

PSA 5.5 Dealing with Water and Leachate

The Contractor shall properly deal with and dispose of water to ensure that the Works are kept sufficiently dry for their proper execution. For this purpose he shall provide, operate and maintain in sufficient quantity such equipment as may be necessary and shall provide other temporary works as may be necessary to minimise damage, inconvenience or interference.

The Contractor shall be responsible for handling all surface and subsurface water in such a way that construction can proceed with a minimum of risk and at no time shall the normal drainage flows by blocked. To this end the Contractor shall divert flow around the working area(s) if necessary. The Contractor shall also take particular care to ensure the safety of the Works against damage by flooding.

In addition to the above, the Contractor is reminded that in areas adjacent to the current landfill, leachate and gas could be present.

The cost of supplying and operating the equipment for dewatering of all excavations and controlling of stormwater and subsurface water on the Works will be held to be included in the Tendered Sum for Initial Supply of the Plant, Material, Labour and Services in Section 1 of the Schedule of Quantities and no separate payment will be made for this work.

PSA-5.7 Safety

- ***Add the following:***

"The Contractor will refer to section, C3.3, Particular Specifications, for the OHSA 1993 Safety Specification."

- ***and:***

"The Contractor shall provide security watchmen and all measures necessary to secure the works for the contract as he deems fit. The cost thereof will be deemed to be included in the relevant rates tendered. The Contractor must ensure that all his employees as well as the employees of his subcontractors are able to identify themselves as members of the construction team.

The Lovu Landfill Site is an operational site, LANDFILL GAS (containing methane) may be generated within the site and leachate collection system.

NAKED FLAMES AND SMOKING IS NOT PERMITTED anywhere on the Landfill Site and due care should be taken, in compliance with all the laws, when working on the Site.

DUE CARE AND DILIGENCE should also be exercised when work in carried out in the vicinity and/or adjacent to the previous disposal areas.

ALL LIQUIDS emanating from the landfill and surroundings are deemed to be DANGEROUS. Thus no liquid may be collected or used for any purpose whatsoever.

For health and safety reasons, NO SCAVENGING of any materials deposited on the Landfill Site will be permitted. The Contractor is to ensure that all his workers as well as his Subcontractors comply with this requirement. **Failure to do so may be sufficient grounds to remove persons off site who are in contravention of any of the above.**

PSA-5.9 Site Diary

A site diary in triplicate format, which shall be supplied by the Contractor must be filled in on a daily basis and submitted to the Engineer on a weekly basis. No claims will be considered without the site diary's schedules properly completed (on a daily basis) and submitted.

PSA-5.10 Accommodation of Traffic

The new access may require relocation of the existing gravel road. The Contractor will be required to keep this road open and trafficable to the approval of the Engineer at all times. Any amendments to the current traffic routes must be discussed with and approved by the Engineer.

PSA 6 TOLERANCES

PSA 6.2 Degrees of Accuracy

The Contractor shall construct each of the various parts of the Works to a degree II accuracy except where otherwise specified.

PSA 7 TESTING

Add the following new Subclause:

PSA 7.5 Acceptance Control Testing

A laboratory will not be required on site for the Engineer's use and all acceptance control testing shall be done through a commercial laboratory. The Contractor shall provide his own testing laboratory which shall be capable of carrying out all necessary testing for process control. The Contractor's laboratory shall be subject to the Engineer's approval. The Engineer shall be given free access to the results of testing carried out by the laboratory.

The cost of acceptance control testing carried out by the Engineer will not be for the Contractor's account and will be paid for under the Prime Cost Sum allowed for in the Bill of Quantities, unless the tests reveal that the material is not in accordance with the Specifications, in which case the costs of such test shall be borne by the Contractor. Acceptance control testing will only be carried out on the written instruction of the Engineer.

PSA-8. MEASUREMENT AND PAYMENT

PSA.8.3.2 Facilities for the Contractor

In addition to the requirements of Cl 8.3.2.2 the rates tendered shall be extended to cover the above as well as dealing with leachate, water and dust, all road deviations and traffic control as may be required for the Contractor for the duration of the Contract and the Contractor's obligations in respect of the Environmental Construction Management Plan.

PSA.8.3.5 As built survey

The rate tendered shall the requirement that, on completion of the works, the Contractor is to undertake an as-built survey of the works providing at least the following details:

1. The overall extent and detail of all the works undertaken.
2. Stormwater drainage : manholes/headwall covers and inverts levels and centre co-ordinates.
3. Ducts : end co-ordinates
4. Subsoils end co-ordinates and bend points

PSA.8.4 Scheduled Time-Related Items

PSA.8.4.2.2 Facilities for the Contractor

In addition to the requirements of Cl 8.4.2.2 the rates tendered shall be extended to cover the above as well as dealing with leachate, water and dust, all road deviations and traffic control as may be required for the Contractor for the duration of the Contract and the Contractor's obligations in respect of the Environmental Construction Management Plan.

PSA 8.5 Sums stated Provisionally by the Engineer

Amend the penultimate sentence of Subclause 8,5 to read:

"The percentage rate for (b)(2) above shall cover the Contractor's overheads, charges and profit on the work covered by the sums provisionally stated for (b)(1) above. Payment will be made on the basis of the sums actually paid for such work".

PSA 8.6 Prime Cost Items

Amend the penultimate sentence of Subclause 8.6 to read:

"The percentage rate for (b) above shall cover the Contractor's overheads, charges and profit on the work covered by the sums provisionally stated for (b) above. Payment will be made on the basis of the sums actually paid for such work".

PSA-8.5 Sums stated provisionally by Engineer

PSA-8.5(b) 1) Sums stated provisionally by Engineer

i) Cost of Acceptance Testing

The provisional sum covers the cost of acceptance testing specifically ordered by the Engineer.

ii) Additional Survey

The provisional sum covers the cost of additional survey detail as may be needed from time to time.

iii) Indigenous Vegetation & education facilities

The provisional sum covers the cost of the transplanting and planting of indigenous vegetation on the site by a specialist horticulturist during the Contract and the extension of the education facilities as needed.

iv) Environmental Construction Management Plan Audits

The sum covers the cost of Environmental Construction Management Plan audit by an independent Environmental Professional as ordered by the Engineer.

v) Community Liaison Officer

The provisional sum covers the cost of the Community Liaison Officer who will be employed by the Contractor for the duration of the contract.

vi) Mentoring of CPG Contractor

The provisional sum is for the Contractor to provide mentoring to CPG Contractors should this be required and this sum will be utilised at the discretion of the Engineer. The item shall cover direct pricing assistance, training and supervision of the CPG subcontractors.

vii) Allowance for a Social Facilitator

The provisional sum covers the cost of a Social Facilitator as instructed by the Engineer by the Contractor and for a period as instructed by the Engineer.

viii) Flowmeters for leachate measurement

The provisional sum covers the costs of providing leachate measurement and other leachate and leachate treatment plant instrumentation should this be required and this sum will be utilised at the discretion of the Engineer.

ix) Temperature monitoring

The provisional sum covers the costs of providing temperature monitoring should this be required by the approval conditions of the works and this sum will be utilised at the discretion of the Engineer.

x) Provision of a CQA Plan

The provisional sum is to cover the costs of implementing a CQA Plan should this be required as required by the regulatory authorities conditions of approval. This sum will be utilised at the discretion of the Engineer.

xi) Irrigation system for contaminated stormwater.

The provisional sum is to cover the cost of providing an irrigation system for contaminated stormwater by a specialist subcontractor from quotes obtained by, or on instruction from, the Engineer.

xii) Workshop & washbay relocation

The provisional sum is to cover the cost of the relocation of the workshop and washbay structures from their present position where they are obstructing the expanded landfilling operations to a more suitable position within the infrastructure area. It is anticipated that this work will be undertaken by a specialist subcontractor from quotes obtained by, or on instruction from, the Engineer.

xiii) Services (water and electricity) to relocated workshop & washbay

This provisional sum is to cover the cost of the repair, relocation and improvement of services necessitated by the relocated workshop and washbay structures. It is anticipated that this work will be undertaken by specialist subcontractors from quotes obtained by, or on instruction from, the Engineer.

xiv) Pump from Leachate Pond 3 to Leachate Treatment Plant

This provisional sum is to cover the cost of a pump and all connections to transfer leachate from the new Leachate Pond 3 to the Leachate Treatment Plant. It is anticipated that this work will be undertaken by a specialist subcontractor from quotes obtained by, or on instruction from, the Engineer.

PSAB ENGINEER'S OFFICES

PSAB.1 SCOPE

This section of the specification covers the provision of an office and facilities for the Engineer.

PSAB.3.2 OFFICE BUILDING

Replace the contents of this clause with the following: -

The Contractor shall supply, maintain and service one office of 9m^2 minimum floor space and a ceiling height of 2.5m with lighting for the sole use of the Engineer.

The furniture stated SABS 1200 AB-1986 clause 3.2, (a.... j) shall be replaced by the following items to be provided in the site office:

(a) One desk 1.5m long x 0.9m wide with four (4) drawers (one lockable).

(b) One trestle table, 2.0m long x 1.0m wide x 0.9m high, with a smooth top.

(c) One Office swivel chair, two visitors' chairs.

(d) An acceptable blind to each window.

(e) A pin board, 1.5m long x 1.2m high for displaying plans and diagrams.

(f) A whiteboard of 2m^2 size with 3 coloured markers and duster

(g) Acceptable lighting

(h) Provision of two 15-amp volt plug points with power supply

(i) An air conditioner in proper working order.

(j) One A3 colour printer.

(k) One small electric refrigerator.

(l) An acceptable blind on each window.

(m) a fire extinguisher which shall be properly maintained by the Contractor

(n) -an A0 Drawing rack with minimum of 10No. hangers.

The Contractor sum shall also include for a basin with running water, a lockable toilet for the exclusive use by the Engineer and Employer and 2 No. covered parking bays that shall be erected for the sole use by the Engineer, Employer and his staff.

The Contractor shall also supply, maintain and service a boardroom for 24m^2 minimum floor area able to seat 10 people for joint use by him and the Engineer. This room shall be equipped with adequate lighting, two power points, chairs, tables, a 2m^2 whiteboard, a 2.5m^2 pin board with stationary and an air-conditioner in proper working order.

The Contractor will be required to provide for daily cleaning of the Engineer's office, boardroom and toilets. Payment for the cleaning of the offices will be deemed to be included in the Tenderer's General rates.

The provision of the site notice board shall be allowed for under this item.

PSC SITE CLEARANCE

PSC-3 MATERIALS

PSC-3.1 Disposal of Materials

- ***Add the following clause:***

Material obtained from clearing and grubbing is to be disposed of on site in a position agreed to by the Engineer within 2km of the site.

PSC-8 MEASUREMENT AND PAYMENT

PSC-8.1 Basic Principles

- ***Add the following:***

Site Clearance shall only be measured where the Engineer orders that clearing is to be removed prior to any construction. The site shall not be measured as a whole.

PSC-8.2 Scheduled Items

- ***Add the following:***

PSC-8.2.1 In addition to the requirements of Clause 8.2.1, the rate shall cover the removal of all sugar cane, any trees (girth up to 2,0m) and stumps (as per Clause 8.2.2), trimming of above ground obstructions including refuse, rubble, roads and fencing. Including re-clearing and the sealing of all pipes as instructed. To include for all transport and activities as per Clause 8.2.9 and disposal as directed by the Engineer. Any backfilling required shall be with material of a minimum quality of G7 following TRH 14.

PSC-8.2.11 Transplanting trees Unit: No.

The rate tendered shall cover careful excavation under the supervision of the Engineer to excavate around and loosen the trees designated for transplanting, their removal, loading transport and offloading at prepared positions, all using wide strap slings and avoiding damage to the trees. Backfilling of the holes left by removing the trees shall be included in the rate tendered.

PSC-8.2.12 Removal of material from existing edge berm Unit: m^3

The rate tendered shall include for the removal of all Municipal Solid Waste (MSW) or other materials having to be removed from the overlap area as part of the operations described in Clause PSC-8.2.13 will be measured under this item. The quantity shall be measured by survey in place of the material having to be removed in order to undertake the operations described in Clause PSC-8.2.13 and as directed by the Engineer.

The rate tendered shall include for the excavation, loading and transport as per Clause 8.2.9, of the MSW without damage to the existing liner and its removal to the DSW disposal area.

A significant proportion of the material required to be removed may be Municipal Solid Waste (MSW) with a varying age of placement and including recently placed MSW. MSW comprises domestic refuse, rubble (concrete brick, stone, plaster etc), plastic, metal pieces and vegetation (garden refuse).

The MSW excavated shall be removed and placed within the landfill area, as directed by the Engineer, and on the same day as excavation takes place in order to limit odours. Open MSW shall not be allowed to stand open for more than **one** working day without covering with a minimum of 150mm of soil (**paid for elsewhere**), unless permission from the Engineer is obtained. The rate tendered shall include for the covering described above and for spraying odour control chemicals during excavation as required by the Engineer. The odour control chemicals shall be provided by DSW and applied using a knapsack sprayer provided by the Contractor.

PSC-8.2.13 Remove existing edge berm and liner layerworks to expose liner Unit: m

The quantity shall be the measured distance around the perimeter of the area where the existing liner is to be exposed. The rate tendered shall include for removing all existing liner layerworks materials in the overlap area which could include, but is not limited to :

any existing edge berm of cement stabilised soil at approximately 1m³/m length,

the ±150mm thickness of stone comprising a drainage layer and,

the ±150mm to 300mm thickness of sand or cement stabilised sand of the liner protection layer (totalling approximately 0,5m³/metre)

to expose and cut away any existing geotextiles where these are present and expose the liner, where these exist and as instructed.

All work is to be done by hand and damage to the existing liner avoided. The existing liner is to be exposed and cleaned by brooming, to the Engineer's approval, preparatory to over or under laying, as required, with the new liner. The work is to be programmed to avoid damage to the exposed liner.

Damage to the existing liner will be repaired at the Contractor's expense and by methods approved by the Engineer.

PSC-8.2.14 Break out ex concrete approx. 250mm thick in paving, foundations and walls Unit: m^3

The quantity shall be the measured on site before demolition and removal and will include all works necessary for this and the disposal of the broken material as directed on site.

PSD EARTHWORKS

PSD-1 SCOPE

The work covered under this specification comprises the bulk earthworks required for the new access road and cell construction. It excludes road layerworks, trenching and the construction of liner layers.

PSD-3 MATERIALS

PSD.3.1 Classification for Excavation Purposes

For the purposes of this contract Intermediate excavation and all Boulder excavation as specified in Clause D.3.1, and all other material including large boulders but **excluding** Hard rock excavation as per Clause D.3.1.2(c), shall be included, measured and classified with Soft excavation as specified in Clause D.3.1.2(a).

PSD-3.3 Selection

PSD-3.3.2 Backfilling & Embankments

- ***Add the following:***

Excavated material shall be placed either into fill or stockpile. As the properties of the material are required for the various uses discussed (i.e. topsoil, selected layer/backfill) the Contractor will be required to select the material excavated for use for specific operations. The identification of the various types of material will be made by the Engineer and it will be the Contractor's responsibility to carefully select the material and ensure it is not mixed with other types.

PSD-5 CONSTRUCTION

PSD-5.1 Precautions

PSD-5.1.1 Safety

PSD-5.1.1.2 Safeguarding of excavations

- ***Add the following additional subitems:***

"(g) The Contractor or his agent or his representative shall **not** require or allow any person to work under unsupported overhanging material or in an excavation which is more than 1,5 m deep, and any excavation which has not been adequately supported or braced if there is a danger of the overhanging material or the sides of the excavation collapsing. The support, shoring or bracing to be designed and constructed by the Contractor, shall be strong and sturdy enough to support the sides of the excavation in question."

PSD-5.2 Method and Procedures

PSD.5.2.3 Placing and Compaction

PSD.5.2.3.1 Embankments

Clause D.5.2.3.1 shall be extended to include for benching and bonding as instructed in fill and existing refuse slopes.

Clause D.5.2.3.1 shall also be extended to include for stockpiling as detailed in SABS 1200DM generally and by Clause 5.2.2.4.

PSD-5.2.4 Finishing

PSD-5.2.4.1 Final Grading

Clause D.5.2.4.1 is to be extended to cover **all** slopes (both in cut and fill) which are to be lined. In addition to the requirements of this clause, the slopes shall be trimmed to a plane surface free from loose material and stones larger than 50mm maximum dimension and having no local humps or depressions greater than 100mm and meeting with the Engineer's approval. The surface shall be finished or compacted to provide a stable slope.

The finished surfaces of all works that will be in contact with the liner shall be free of all protrusions, stones, vegetation, roots, rubble, refuse and particles that could damage either type of liner. The surface shall be approved by the Engineer prior to any liner placement.

PSD-5.2.4.2 Topsoiling

- ***Delete the last sentence and replace with:***

The final thickness of the topsoil shall be 100mm."

PSD-5.2.4.3 Grass or Other Vegetation

The grass supplied for this contract shall be either Buffalo or Cynodan Dactylon.

PSD-5.2.5 Transport for Earthworks

PSD-5.2.5.1 Freehaul

- ***Add the following:***

"For this contract all haul will be regarded as free haul and the cost of transportation of all materials will be deemed to be included in the rates and prices tendered in the Schedule of Quantities."

PSD-5.2.5.2 Overhaul

Overhaul will not be payable on this contract.

PSD-8 MEASUREMENT AND PAYMENT

PSD.8.1 Basic Principles

The requirements of Clause D.8 shall be extended as follows :

"The section shall be extended to include compaction of all materials as specified. This includes for fill to be compacted in restricted conditions with limited access and of variable volumes, including that in thin layers and on slopes of up to around 1v:3h. The rate is to include for the disposal of up to 5% by volume of unsuitable material.

The various types of fill will be identified separately.

The rate shall include for the cutting of benches in all materials. The fill placed on such benches shall be included in the measurement. **The volume of materials cut for such benches from the existing slope and placed in fill shall not be included in the measurement for this item.**

No stockpile handling will be measured in this contract. The Contractor is to plan the work, and allow in the rates tendered, for any stockpiling or stockpile handling that may be required.

PSD-8.2 Computation of Quantities

- ***Add the following:***

PSD-8.2.1 Measurement of the bulk earthworks only for this contract shall be in cubic metres (m^3) calculated by Average End Areas method or Digital Terrain Model (DTM.). The measurement shall be based on the total cut volume measured after site clearance and the topsoil has been stripped.

PSD-8.3 Scheduled Items

PSD-8.3.2 Bulk Excavation

This clause shall be extended to allow for excavation to stockpile and all stockpile handling.

PSD-8.3.4 Importing of Materials

The rate for the importation of material shall cover the cost of procuring the materials, placing and spreading into position.

PSD-8.3.6 Overhaul

This item is deleted.

PSD-8.3.7 Lateral Support

This item is not measured and allowance for lateral support must be included in the relevant rates.

PSD-8.3.8 Existing Services c) Excavate by hand to expose existing services

The rate shall cover all hand work to carefully expose existing services as directed and without damaging such services.

PSD-8.3.11 Grassing or other Vegetation Cover

Grass planting on this contract shall distinguish between stolons (runners) and sodding. Supply of grass shall be from the Contractor's own source but the type of grass shall be subject to the Engineer's approval.

PSDB EARTHWORKS FOR PIPE TRENCHES

PSDB-1 SCOPE

This Section of the specification shall be extended to include the liner anchor trenches, subsoil drains, biogas & leachate drainage and stormwater pipework shall also be included.

PSDB-3 MATERIALS

PSDB.3.1 Classification for Excavation Purposes

PSDB.3.1.2 Classification of Excavation

For the purposes of this contract, Intermediate excavation as specified in SABS 1200D Clause 3.1.2 (b), shall be included, measured and classified with Soft excavation as specified in SABS 1200D Clause 3.1.2 (a). The excavation through any and all road or paving layerworks shall be included as Soft excavation.

PSDB.3.4.1 9mm, 13mm, 19mm and 53mm stone

- ***Add the following:***

The 9mm, 13mm, 19mm and 53mm stone shall be clean, hard, durable crushed concrete aggregate complying with SABS 1083.

PSDB.3.5.1 Cement Stabilised Backfill Material

In addition, and as a clarification to the requirements of Clause DB.3.5, the material to which cement is added to make stabilised backfill shall be selected granular material as per Clause DB.3.3 but with a minimum Grading Modulus of 1,2 and a maximum Plasticity Index (PI) of 10. Maximum particle size to be 13mm. The material shall be mixed with 6% cement by mass before being compacted to 95% Mod AASHTO density at the appropriate Optimum Moisture Content (OMC), or as approved by the Engineer.

PSDB-5 CONSTRUCTION

- ***Add:***

PSDB-5.6 Anchor Trench Position

The anchor trenches shall be placed a **minimum of 800mm**, or a distance as specified, back from the edge slopes to be covered. The front edge of the trench shall be rounded with a minimum radius of 300mm (or as approved by the Engineer) to eliminate sharp corners that could damage the liner. The liner shall extend into the anchor trench as shown on the drawings. The cement stabilised material used for backfill shall have a maximum particle size of 19mm and shall be placed in two lifts to allow for compaction, or to meet with the Engineer's approval.

PSDB-8 MEASUREMENT AND PAYMENT

PSDB.8.3.2 (a) Excavate in all Materials for Trenches, Backfill, Compact and Dispose of Surplus Material

- ***Add:***

Pipes shall be buried to provide at **least 300mm** of cover over the crown of the pipe. Bedding shall be as specified for **"FLEXIBLE PIPES"** in SABS 1200LB. A minimum trench width of 450mm, and all over break, shall be allowed for. The rates tendered shall also include for all operations required for the disposal of unsuitable material or surplus material caused by the importation of suitable backfill or bedding materials.

The rate is to include for excavations of monitoring drains in the base layer and gas drains (if any) in the leachate drainage layer.

Allowance should be made for hand work as needed and in the vicinity of any existing services or structures and the protection of such existing services or structures. Any removal and trenching through roads or any other material not specifically measured shall be included in the rate tendered. Compaction road reserve areas as required by Clause DB.8.3.3.3 shall be included in the rate tendered. Allowance to control all liquid inflow as required by Clause DB.8.3.4 b) shall be included in the rate tendered. Accommodation of traffic as required by Clause DB 8.3.7 shall be included in the rate.

Allowance should be made for the Contractor or his agent or his representative **not** requiring or allowing any person to work under unsupported overhanging material or in an excavation which is more than **1,2m deep**, and any excavation which has not been adequately supported or braced if there is a danger of the overhanging material or the sides of the excavation collapsing. The support, shoring or bracing to be designed and constructed and allowed for in his rate by the Contractor and shall be strong and sturdy enough to support the sides of the excavation in question.

In addition to the requirements of Clause 8.3.2 allowance must be made in the rates for the trimming, smoothing and rounding of the excavation to accommodate the liners without damage and as directed by the Engineer. Anchor trenches are to be constructed so as always to be free draining.

PSDB-8.3.3 Excavation Ancillaries

PSDB-8.3.3.1 Imported Backfill Materials

Make up deficiency in backfill material by importation from commercial source.

1. 53mm, 13mm, 9mm stone and Coarse Sand to Subsoil Drainage

PSDB-8.3.3.4 Overhaul

There will be no overhaul measured in this contract. All haulage including that from commercial sources will be considered as freehaul. The cost of all haulage is deemed to be covered by other rates in the Schedule of Quantities.

PSDB.8.3.8 Cement Stabilised Backfill Material - Anchor trench backfill

In addition to the requirements of Clause DB.8 the rate tendered for these items shall include for placing and bedding the materials around any pipes (if present) or lining materials without damaging them and for packing to form drainage layers as required. In addition to the requirements of Clause DB.8.3.3.1.c) allowance must be made in the rate tendered to place and compact the cement stabilised backfill to 95% Mod AASHTO density, or as approved by the Engineer. The rate shall allow for this having to be undertaken in stages.

Stabilised sand having to be packed on the anchor trench face to smooth the radius for the geomembrane anchorage (PSDB-5.6) shall be included in this item.

PSDM EARTHWORKS (Road Subgrade)

PSDM-1 SCOPE

The scope of this specification is extended to include the construction of liner (including any compacted clay lining (CCL), temporary capping, road layers and the excavation for any open drains.

PSDM-2 INTERPRETATION

PSDM-2.3 Definitions and Abbreviations

- ***Add the following:***

Leachate : Toxic effluent produced during the decomposition of waste.

Liner System :A layered barrier to prevent the escape of leachate into the environment.

Synthetic Materials :Either a geomembrane 1,5mm thick High Density Polyethylene (HDPE) sheeting and/or Geosynthetic Clay Liner (GCL).

PSDM-3 MATERIALS

Material quality is generally as designated by TRH 14, Guidelines for road construction materials s published by the Department of Transport NITRR and CSIR.

PSDM.3.1 Classification for Excavation Purposes

For the purposes of this contract Intermediate excavation and all Boulder excavation as specified in Clause D.3.1, and all other material including large boulders, but **excluding** Hard rock excavation as per Clause D.3.1.2 ©, shall be included, measured and classified with Soft excavation as specified in Clause D.3.1.2(a).

PSDM-3.2 Classification for Placing Purposes

The materials classified shall be expanded to cover all the natural materials required for the liner system either obtained from site or imported.

PSDM-3.2.8 Leachate Drainage Layer

The material for this layer shall comprise clean, washed, single sized crushed stone of the specified size (75mm; or as approved by the Engineer), graded and meeting with the requirements of Table 7 (24) of SABS 1083 - 1976 (Aggregates from Natural Sources) except that a maximum of 15% may pass the 37,5mm sieve.

PSDM-3.2.9 Cement

The cement shall be general purpose or ordinary Portland cement complying with SABS ENV 197 -1.

PSDM-3.2.10 Selected Layer (Roadworks)

- ***Replace with the following:***

The material supplied for the selected layer is to be a G5 in terms of TRH 14 and comply with the following requirements:

Grading
Maximum size of 63mm and a minimum grading modulus of 1,5mm

Atterberg Limits
Liquid Limit (maximum) 30
Plasticity Index (maximum) 30
Linear Shrinkage (%) (maximum) 30
Linear Shrinkage % passing 0,425mm sieve (maximum) 30

Strength and Swell

CBR after soaking of greater than 30% at 95% Mod AASHTO and a maximum swell of 0,5% at 100% Mod AASHTO density.

PSDM-3.2.11 Gravel Surfacing

The material supplied for the surfacing is to comply with that specified for the selected layer in PSDM-3.2.10 above.

PSDM-3.2.12 Compacted Clay Liner (CCL)

The material for the CCL is to be clay soil, generally with a Plasticity Index (PI) of greater than 10 and a maximum particle size of 4mm or such that no damage to the overlying geomembrane will occur. The CCL shall be compacted to a minimum dry density of 95% of the Standard Proctor maximum dry density, at a water content of Proctor Optimum to Proctor Optimum +2%. Permeability shall be less than 1 x 10^{-6} cm/s.

PSDM-4 PLANT

Further to this clause the plant used on this site shall be selected after careful consideration as to the nature of the works and in particular the necessity to work on slopes and the special requirements needed when working in close proximity to sensitive, costly materials. Plant used above the geomembrane and GCL must be light enough to avoid damaging the line but be but capable of achieving the specified tolerances and compaction.

PSDM-5 CONSTRUCTION

PSDM-5.2 Methods & Procedures

PSDM-5.2.2.4 Selection and Stockpiling: Compacted Clay Liner (CCL)

The approval or designation of a particular borrow area for a particular purpose does not imply that all the material is suitable for that purpose or should be used for that purpose. The Contractor shall select suitable material from that source, discard unsuitable material and reserve material for other purposes as necessary. When required and as ordered by the Engineer, material shall be stockpiled for later use when the excavation thereof is unavoidable in order to excavate the material required at the time.

PSDM-5.2.3 Treatment of Roadbed

PSDM-5.2.3.2 Removal of Unsuitable Material

Where required by the Engineer, areas of in-situ material are to be excavated below formation to a depth of 150mm to remove 'hard/unsuitable' material that could damage the liner layers. This material shall be replaced by selected material excavated from site.

In areas which contain a significant proportion of rock where directed by the Engineer, the formation is to be ripped and scarified to a depth of 150mm and removed and replaced with suitable material. The formation shall then be worked to tolerance and compacted to a nominal density of 90% Mod AASHTO density, or as accepted by the Engineer, on slopes of up to around 1v:3h as specified under Clause DA 5.5.

The layer shall be finished to be free draining and to a tolerance of ± 35mm in 3m (no gap greater than 70mm to be measured under a 3m straight edge), or as accepted by the Engineer."

PSDM-5.2.4 Fill

PSDM.5.2.4.1 Finishing

Clause DM.5.2.4.3 is to be extended to cover **all** slopes (both in cut and fill) which are to be lined. In addition to the requirements of this clause, the slopes shall be trimmed to a plane surface free from loose material and stones larger than 50mm maximum dimension and having no local humps or depressions greater than 100mm and meeting with the Engineer's approval. The surface shall be finished or compacted to provide a stable slope.

The finished surfaces of all works that will be in contact with the liner shall be free of all protrusions, stones, vegetation, roots, rubble, refuse and particles that could damage either type of liner. The surface shall be approved by the Engineer prior to any liner placement.

PSDM-5.2.4.2 Placing and Compaction

c) Breaking down of material

Further to this clause, material from site where reserved for use in the base and protection layers may require additional treatment by sieving and/or breaking down/rolling to reduce the particle size to that specified.

PSDM.5.2.5 Transport for Earthworks

PSDM.5.2.5.1 Freehaul

- ***Add the following:***

"For this contract all haul will be regarded as free haul and the cost of transportation of all materials will be deemed to be included in the rates and prices tendered in the Schedule of Quantities."

PSDM-5.2.9 Imported Base: Under drainage and Monitoring system unit: m^3

For this item, the requirements of SABS 1200 DM shall be extended as follows :

The material shall be the specified thickness of clayey or silty, sand (possibly Berea Red Sand) of a **G7/G8 quality** with a Plasticity Index of less than 15 and all particles passing the 4.75mm sieve, or no particles larger than 6mm and meeting with the approval of the Engineer.

The material as specified is to be placed and spread in a uniform layer with the correct moisture content to enable the specified compaction of 93% Mod AASHTO, or that as approved by the Engineer, to be achieved. Placement shall be undertaken in such a way as to ensure that the layer remains stable. This may require starting at the base of the slope to be lined and progress upwards.

The finish is to meet with the Engineer's approval and generally should have no protrusions which may damage the geomembrane, to be free draining and to a tolerance of ±15mm in 3m (no gap greater than 30mm to be measured under a 3m straight edge). The base layer surface should be smooth and free of vegetation, standing water, and angular stones or other foreign matter that could damage the geomembrane. The final subgrade surface may have to be rolled with a smooth-drum compactor of sufficient weight to remove any wheel ruts, footprints, or other abrupt grade changes. All protrusions extending more than 13mm from the surface shall either be removed, crushed, or pushed into the surface with the smooth-drum compactor. The finished surface shall be subject to the approval of the Engineer and inspected to check that no protrusions, which may damage the geomembrane, are present.

The rate shall cover all the costs of acquiring suitable material, handling, transporting regardless of distance stockpiling and storing then placing as specified. Placement will be on slopes generally not steeper than 1v:3h. Compaction shall be to 93% Mod AASHTO density, or as approved by the Engineer".

The rate is to include for excavation for the monitoring drains and removal of the spoil, but not for construction of the drains themselves.

PSDM-5.2.10 Imported Liner Protection Layer: Stabilised Sand unit: m^3

For this item, the requirements of SABS 1200 DM shall be extended as follows :

NOTE: This layer is critical to the stability of the liner system

Timing of the placement of the layer is critical as the GCL needs covering before hydration and the HDPE geomembrane requires protection

"Volume to be measured after placement and achieving the specified strength. The rate shall cover approved material that shall be the specified thickness of clean fine sand or silty sand (generally *PI < 10; GM >0,75; all particles passing the 4,75mm sieve and not more than 10% passing the 0,075mm sieve*), mixed with cement and compacted to achieve a minimum strength of **1,2MPa or 2.0MPa as specified**.

Cement shall be added at a **minimum** of 6% by mass, or as approved by the Engineer to obtain the strength specified.

A minimum unconfined compression strength of 1,2MPa or 2MPa as specified is required to be obtained after 7 days, as determined in the TMH 1 Test Method A14. The rate shall include for the provision of the suitable sand, cement at 6% by mass and mixing, watering, shaping, compacting, site control testing and including all supervision, labour, plant. The material as specified is to be premixed, placed in a uniform layer with the correct moisture and cement content to achieve the specified strength of 1,2MPa after 7 days and trimmed to an even thickness and slope.

Placement shall generally be in approximately horizontal bands of a length that allows the placed material to set without slumping or **imparting tension into the underlying geomembrane**. Placement may also be undertaken in such a way as to ensure that the layer remains stable within the limitations of the geosynthetic materials used and as approved by the Engineer. This may require starting at the base of the slope to be lined and progress upwards and this is to be allowed for.

The cement treated layer shall be protected against rapid drying during the first 4 days after completion by keeping it continuously damp.

Placement will be on slopes generally not steeper than around 1v:3h (and generally around 1v:5h) and in such a way as to ensure that the layer remains stable. Restricted placement is to be allowed for. Compaction shall be to 93% Mod AASHTO density and completed within 10 hours of first mixing in the cement, or as approved by the Engineer".

The layer shall be finished to have a minimum thickness of between 125mm and 300mm as specified, or as approved, and to be free draining to a tolerance of ±20mm in 3m (no gap greater than 40mm to be measured under a 3m straight edge)".

PSDM-5.2.11 Leachate Drainage Layer

The stone for the leachate drainage layers is to be placed and compacted immediately after the liner protection layer and on the same day, or within such time as is allowed by the Engineer. Placement shall be in such a way as to ensure, to the satisfaction of the Engineer, that the Liner is not damaged. The stone may be placed by hand to the specified thickness using side forms. Alternative methods of placement are to be to the approval of the Engineer.

Placement will be on slopes generally not steeper than around 1v:2.5h. Levelling and nominal compaction are required to be allowed for.

PSDM-5.2.12 Compacted Clay Liner (CCL)

The CCL is to be placed in layers to achieve the specified compaction, have a surface that cannot damage the overlying geomembrane and finished to ensure that it is free draining. Construction shall include wetting to avoid shrinkage cracking and re-working immediately before geomembrane placement.

PSDM-6 TOLERANCES

The tolerances applied to the road bed and selected layers shall be as indicated in the relevant clauses. With regard to the selected layer the average level of a layer shall be such that the thickness of the following layer shall not be less than that specified.

The allowance tolerance for landfill areas shall be:

Layer thickness	:Base layer	- 5mm (max of 8% of tests)
	Protection layer	- 5mm (max. of 5%) of tests)
	Leachate Drainage layer	-10mm (max of 8% of tests)
Level	:	± 50mm

PSDM-7.2 PROCESS CONTROL Compacted Clay Liner (CCL)

Add for the CCL process control:

Test	**Frequency**
Indicator & hydrometer analysis	1No. per 5 000m^2 per lift
Proctor maximum dry density	1No. per 5 000m^2 per lift
Laboratory permeability test (constant head)	1No. per 5 000m^2; 4No. minimum
Compaction testing (nuclear gauge)	4No. per 1 500m^2 per lift

PSDM-8 MEASUREMENT AND PAYMENT

PDDM-8.1 Basic Principles

It is noted that road bed preparation shall be measured over the entire cell area. It shall be measured along the actual ground surface and not in plan. Similarly, the selected layer for the liner system shall be measured along the actual surface not plan.

PSDM-8.3 Scheduled Items

PSDM-8.3.3 Treatment of Road Bed

- ***Add the following:***

For this item, the rate is required to allow for the operations described in Clause DM 8.3.3. The rate for this item is to be extended to include for ripping and scarifying to a depth of 150mm and the removal of particles greater than 100mm in size and replacement with suitable material. The formation shall then be trimmed to tolerance and compacted to a nominal 90% Mod AASHTO density, or as approved by the Engineer. Work is required to be undertaken on **slopes of up to around 1v:2,5h**.

The rate is also to allow for all trimming operations. Generally all particles protruding more than ***30mm*** above soil or rock surface are to be trimmed and undulations filled in.

In areas which contain a significant proportion of rock or rubble greater than 150mm in size, the formation is to be ripped and scarified to a depth of 150mm and particles greater than 100mm in size removed and replaced with suitable material. The formation shall then be worked to tolerance and compacted to a nominal density of 93% Mod AASHTO density, or as accepted by the Engineer, on slopes of up to around 1v:3h.

The layer shall be finished to be free draining and to a tolerance of ±35mm in 3m (no gap greater than 70mm to be measured under a 3m straight edge), or as accepted by the Engineer.

PSDM-8.3.4 Road and Liner Layers unit: m^3

For this item, the requirements of Clause DM.8.3.4 shall be extended as follows :

The measured volume for the selected layers shall be the cubic metre (m^3) measured in place after compaction. The rate shall where necessary, include the cover of the procurement of the material, from site or commercial sources, haulage, royalties, processing to break down or mix the material and selection prior to placing to remove oversize or unsuitable material, trimming and compaction to the specified density. It shall also cover any additional precaution/effort required to attain the specified tolerances and work in close proximity to sensitive layer/membranes without damaging them. The rate tendered shall include for the construction of trial sections as specified or instructed.

Material shall have no single Minimum CBR as stated in Clause DM 3.2.2 but be of the quality specified elsewhere.

Details of the materials and construction are covered in Sections 3 and 5 respectively.

PSDM-8.3.4 a) Compacted Clay Liner unit: m^3

For this item, the requirements of Clause DM.8.3.4 shall be extended as follows :

The measured volume for the selected layers shall be the cubic metre (m^3) measured in place after

Details of the materials and construction are covered in Sections 3 and 5 respectively.

PSDM-8.3.12 Overhaul

No overhaul shall be measured under this Contract. All rates will be considered to have made allowance for all haulage.

PSDM-8.3.15 Catchwater mounds and channels

In addition to the requirements of Clause DM-8.3.15 and other relevant clauses, the rate tendered for this item covers excavation, fill placement and backfilling for all lined and unlined drains and catchwater mounds.

PSDM-8.3.17 **Cell Edge berms** unit: m^3

The volume measured will be that of the specified cross sectional area of the edge berm multiplied by the length constructed and approved.

The rate shall cover the cost of all plant, labour and materials associated with forming the berms as specified using approved material (selected clean fine sand or silty sand *(PI <5; GM >0,75; all particles passing the 4,75mm sieve and less than 10% remaining on the 0,075mm sieve)*, mixed with **6% cement** by mass to achieve a minimum strength of 1MPa as determined by TMH1 Method A14.) inclusive of supply, mixing, placing, shaping and compaction to 95% Mod AASHTO density.

Tolerance to be Degree II unless otherwise indicated.

PSC SURFACING REPAIRS (COLTO SPECIFCATIONS)

PSC.1 SCOPE

This section of the specification covers all asphalt pavement repair work, particularly related to removal of existing paving and crack sealing.

PSC 8 MEASUREMENT AND PAYMENT

PSC8.5.1 Standard crack sealing unit: m

Clause C8.5.1 covers standard crack sealing but shall be extended to include cleaning the crack with compressed air, applying herbicide and/or aggregate as needed, priming and sealing then rolling as required. Sealant and prime to be in accordance with Cl A8.5.5.2 or Colseal SBR latex modified mineral filled bitumen emulsion cold pour crack sealant or equal approved. :

PSC8.6.1 Geosynthetic crack sealing unit: m^2

Clause C8.6.1 covers geosynthetic crack sealing but shall be extended to include cleaning cracks with compressed air, applying herbicide as needed, priming and sealing then rolling as required. Sealant to be Colseal SBR latex modified mineral filled bitumen emulsion cold pour crack sealant or equal approved. Geosynthetic to be Sealmac by Kaytech applied in accordance with the manufacturers' specification, or equal approved.

PSC8.8.2.1 Excavation in existing pavements for patching – Asphalt layers unit: m^3

Clause C8.6.1 covers excavation in existing pavements for patching or repair but Cl8.6.2.1 shall be extended to include for saw cutting and all asphalt, granular material and cemented layer removal as instructed on site for all areas of repair.

PSDK GABIONS AND PITCHING

PSDK.1 SCOPE

This section of the specification covers all gabion work and extended to cover all geosynthetic materials, including any geogrid but **excluding** the GCL and geomembrane. Stone pitching and the provision of a fence to intercept wind blown waste scatter is also included.

PSDK-3 MATERIALS

PSDK.3.1.3 Geotextiles : Geofabric

Add the following to Clause DK.3.1.3 :

"All geofabric, unless otherwise specified or approved by the Engineer, shall be a non-woven, continuous monofilament, needle punched polypropylene, polyethylene or polyester polymer or equal approved product and shall contain such additives as are necessary to render the filaments resistant to the effects of ultra-violet radiation in accordance with the following requirements.

The grade shall meet the minimum mass per m² as specified but shall be subject to the Engineer's approval.

The geofabric shall be laid with **minimum laps of 400mm** (unless otherwise specified) and sheets shall be joined together in accordance with the manufacturer's specifications. No metal staples or wire will be allowed for stitching or joining. All material used shall be at least as resistant to degradation as the geofabric itself.

Geofabrics required for this project shall comply with the following:-

Description	Tensile Strength		CBR kN	Throughflow 50mm head l/s/m²	Puncture Resistance (mm)	Min Mass g/m²
	Min kN/m	Elongation %				
Type 2	11	40-65	1.8	50 - 125	27	150
Type 3	14	40-65	2.2	30 - 120	26	180
Type 4	15	40-65	2.6	30 - 100	21	210
Type 5	26	40-65	4.5	30 - 90	16	340
Cushion	75	40-65	11.4	25	7	1 000
Test Method	SANS 10221			ASTM D4491	EN ISO 13433	SANS 10221

PSDK.3.1.3 Geotextiles : Geogrid

The geogrid is to be included in the anchor trench with the geomembrane and is required to provide tensile strength to the cement stabilised protection layer before it gains compressive strength

The geogrid tensile strength in the machine direction shall not be less than 60kN/m at 3% maximum strain. An acceptable product is the RockGrid PC 100/100 or equal approved material.

The minimum roll length for the geogrid shall be 100m.

PSDK.8 MEASUREMENT AND PAYMENT

PSDK.8.2.4 Geotextiles: Geofabric unit: m^2

Clause PSDK.8.2.4 shall cover **all** geosynthetic materials (excluding the GCL and geomembrane) and extended to read :

The area measured shall be the net slope area specified and as finally determined by survey and shall **exclude** the area taken up by wastage and the specified side and end laps.

The unit rate shall include for the plant, labour and materials associated with anchoring, supplying, cutting, placing, joining, overlapping and securing the specified material in position and allowing for waste, lapping requirements (including meeting all of the manufacturer's requirements) and the specified overlap for the particular geosynthetic material being placed. The rate shall allow for sheet placement to ensure tiled overlaps to the approval of the Engineer.

Overlap requirements are a minimum 400mm for the geofabric and 100mm for the geogrid,

The geosynthetic materials shall be continuous down a slope, unless a jointing system is approved.

The rate tendered shall include for incorporation of the geosynthetic into any excavations or anchor trenches as specified and embedding into the cement stabilised protection layer as instructed by the Engineer.

PSDK.8.2.5 Stone pitching unit: m^2

The rate tendered shall cover all work noted in Cl DK8.2.5 and be extended to include any backing and weepholes specified.

PSDK.8.2.5 Wind scatter fencing - poles unit: No.

The rate tendered shall cover all work associated with the supply and full installation of CCA (SANS CCA H4) treated poles to SANS 457 Class 6 (140-159mm diameter) up to 6m long including excavation to depths of up to 1.5m and backfilling with 10MPa concrete measured elsewhere or as approved.

PSDK.8.2.5 Wind scatter fencing - netting unit: m^2

The rate tendered shall cover all work associated with the supply and full installation of shadecloth (20% typically), bird net or netting of suitable strength for wind scatter fencing including supply and installation with fully galvanised steel straining wires (3.15mm diameter to SANS 675) as needed on treated poles up to 5m high. Measured from ground level to the top of the poles excluding any overlaps and wastage.

PSG CONCRETE WORKS

PSG-1 SCOPE

This section covers all concrete work including paving and concrete lined drains.

PSG-5 CONSTRUCTION

PSG-5.5 Concrete

PSG-5.5.7 Construction Joints

The concrete for the GCL / geomembrane / geogrid liner system anchor trenches shall have a maximum particle size of 13mm.

The rate tendered for concrete for the liner protection layer reinforcement shall include for all excavation and trimming without damaging the liner and placement of the concrete on slopes of up to 1v:4h.

PSG-6 TOLERANCES

All work shall be to Degree of Accuracy II unless indicated otherwise.

PSG-8 MEASUREMENT AND PAYMENT

PSG-8.3 Scheduled Concrete Items

- ***Add the following items:***

PSG 8.3.1 Steel bars - mild, high tensile or welded mesh Unit: t.

The rate shall cover the supply, cutting, bending, supporting and fixing of reinforcement as detailed on the reinforcing schedules including all bar sizes and mild, high tensile or welded mesh, covered by and extending the relevant sections of Cl 8.1.2 and 8.3.

PSG 8.4.3.1 Concrete Lined Drains Unit: m^3.

The rate shall cover the supply, erection and stripping of the formwork, the supply, placing, compacting and curing the concrete, finishing the surface to CLASS 3 - Wood float finish and the formation of the contraction joints as specified.

PSG 8.4.3.2 Concrete to structures and paving Unit: m^3.

The rate shall cover the setting out, edge formwork, supply, placing and compacting the concrete, finishing the surface with broomed or power float finish and applying an approved curing compound. The rate is to include for the paving to be generally cast with 8mm wide polysulphide sealed saw cut joints at ±4,5m spacing and construction joints as needed. Paving is expected to be between 150mm and 250mm thick and generally unreinforced.

For structures the rate shall include for all formwork needed, boxing out, finishes and joints as covered by Cl 8.2 and 8.5 as relevant.

PSG 8.4.3.3 Concrete Liner reinforcement ribs Unit: m^3.

The rate shall cover the supply of concrete and full installation of stabilising ribs into the liner protection later including excavation, removal of spoil and placement of the specified concrete without damaging the liner. Ribs are 5MPa concrete, generally 500mm wide and 125mm to 150mm thick... Placement on slopes up to approximately 1:2,5h (leachate pond only).

PSG 8.4.4 Protective screed Unit: m^2.

The rate shall cover the supply of all materials, plant and labour for the full installation of a Multi Armour 100 or 120 or equal approved protective screed to concrete paving as specified. To be applied or laid in accordance with the manufacture's recommendations and a finish surface with power floating or as otherwise approved.

PSLD SEWERS

PSLD-1 SCOPE

This Specification shall be expanded to cover the installation of leachate pipes, valves and structures (silt, oil and grease trap, conservancy tank and manholes etc) as well as other effluent system works. The provision of standpipes, the cleaning by jetting of existing pipelines, tankering of leachate and the provision of a 60kl tank are also covered.

PSLD-3 MATERIALS

PSLD-3.1 Pipes, Filling & Pipe Joints

PSLD-3.1.5 uPVC pipes shall be heavy duty class 34 pipes

- ***Add the following:***

PSLD-3.1.8 HDPE Pipes

High density Polyethylene pipes and fittings shall be of High Density Polyethylene (HDPE) and comply with the relevant requirements of SABS ISO 4427.

All piping shall be **HDPE PE 100** of the class specified unless otherwise approved by the Engineer. The connection system between pipe lengths shall butt fusion welds or electro fusion couplings meeting with the approval of the Engineer. Couplings and pipes shall be by the same manufacturer. The Contractor shall include the cost of these joints in the pipework item.

Storage and handling of the pipe shall be in accordance with the Manufacturer's recommendation. Care is to be taken that pipes are not dragged across the ground and damaged.

PE100 shall be black and shall contain the necessary density of pigmentation to provide protection against ultra violet radiation.

Unless stated otherwise on the drawings, all pipe flanges, including black finish hexagon bolted polyethylene flanges shall be protected by Denso paste, Denso mastic or Denso tape, or equivalent, or shall be stainless steel.

No metal whatsoever shall be used below ground without the Engineer's specific approval.

PSLD-8MEASUREMENT AND PAYMENT

PSLD 8.2.1 Supply, Lay and Bed Pipes Complete with Couplings Unit: m.

In addition to the requirements of Clause LD.8.2.1 the rate tendered for each type, size and specification of pipe and shall include for any joints, welding, bends and special fittings (excluding valves) required and their jointing and bedding.

An allowance is to be included in the rate tendered for the pipework to supply and install up to ten (10) tees, ten (10) bends and ten (10) junctions within the pipework system, as required by the Engineer. Fittings in excess of those specified would be paid for separately.

Connection into any existing pipework is to be included in the rate.

For leachate and gas drainage piping within the leachate drainage layer, no separate payment will be made for excavation, bedding and backfilling. The rate tendered for such piping shall be inclusive of all jointing, excavation & bedding operations.

For the perforated HDPE piping the perforations shall provide a minimum of 4% open area and the type, spacing, size and cleaning of the perforations shall be to the approval of the Engineer. The pipe is to be laid on the liner and bedded in the leachate drainage layer. The rate is to be inclusive of all jointing, excavation & bedding operations.

PSLD 8.2.3 **Manholes** Unit: No.

In addition to the requirements of Clause PSLD.8.2.3 the rate shall include for :

The manholes required to be allowed for under this item are standard precast ring manholes as shown on Durban Council Standard Drawing Numbers 38570 and 38571. The tendered sum for each manhole under this item is to be extended from the requirements of Clause PSLD 5.6 to include for:

a) The manholes to be painted internally and externally, before installation, with ABE Super Laycold or similar approved bitumen emulsion as a protection against corrosion by landfill gas. The joints between units are to be sealed with an approved bituminous product "Bitujoint" or similar approved product.

b) The **excavation and backfilling** for the manholes in all materials.

c) Breaking out of the side walls and making good around pipework or drainage outlets as required to the satisfaction of the Engineer.

The rate shall differentiate between manholes of different diameters and in different depth categories.

PSLD 8.2.13 **Valves for HDPE pipe up to and including 200mm OD** Unit: No.

The rate shall cover the supply of all materials and installation of valves for up to 160mm OD HDPE piping. The valves shall be suitable for use with landfill leachate with a minimum of a 25 year service life and subject to the approval of the Engineer.

PSLD 8.2.14 **Connecting into existing leachate sewer systems** Unit: No.

The rate shall cover the supply of all materials and work to connect into existing leachate piping and/or manholes excluding piping & manholes but all cutting, jointing and making good.

PSLD 8.2.15 **Standpipe for leachate or water discharge to tanker** Unit: No.

The rate shall cover the supply of all materials and work to provide a standpipe to discharge into a road tanker as per detail. The piping, valves, supports and foundations will e measured separately.

PSLD 8.2.16 **Conservancy tank as per detail.** Unit: No.

The rate shall cover the supply of all materials, plant and labour to fully construct and connect into pipework the additional conservancy tank as details on the drawings.

PSLD 8.2.17 **Silt, oil & grease trap as per detail.** Unit: No.

The rate shall cover the supply of all materials, plant and labour to fully construct and connect into pipework the additional septic tank as details on the drawings.

PSLD.8.2.18 **Cleaning of existing sewers by pressure jetting** Unit: m^2

The rate tendered shall include for all plant, labour and materials to clean existing sewer (leachate and sewage) piping of between 110mm to 250mm nominal diameter inclusive, primarily using approved pressure jetting equipment or other approved means, including emptying / de silting etc at the manholes. The rate shall include for all removed material to be disposed of on the landfill as indicated,

PSLD.8.2.19 **Tankering of leachate** Unit: m^3

The rate tendered shall include for all plant, labour and equipment to pump leachate into a road tanker from the existing storage ponds at the Lovu Landfill site, weigh over the site weighbridges and transport to the Municipal Southern Wastewater Treatment Works at Merebank. Provisional.

PSLD.8.2.20 **WATER STORAGE RESERVOIR ±60kl** Unit No.

The rate shall be for the supply, installation and commissioning of a nominal 60m^3 tank, complete, roofed, with all panels and roof of Zincalume coated steel to SANS 9364 suitable for use in the coastal environment, or Grade 316 stainless steel (ASTM A240). Bolts should be hot dip galvanised to SANS 121. The roof should be a self supporting dome roof. The tank is to have wind girts as needed and a fixed access ladder with safety cage, platform, access hatch and hand rails, all suitably corrosion protected. Level indicator and ventilation is to be provided. All the above to be included in the rate tendered.

Liner The liner should be PVC, fabric reinforced or equal approved. Generally minimum mass 700g/m^2 and with the properties as below or better.

Certified Property	**Value**	**Test Method (ASTM)**
Thickness (mm)	0.7	D5199
Min Mass (g/m^2)	700	
Tensile Properties		BS 3424 ASTM D882
Strength at break (kN/m)	40 12.8	
Elongation (%)	380%	
Tear Strength (N)	350 35	BS 3424 ASTM D1004
Dimensional stability (max change MD & TD)	3%	D1204
Specific Gravity (g/cm^3)	1.2	D792
Average plasticiser molecular weight	400	D2124
Volatile Loss (% max)	0.7	D1203
Hydrostatic resistance (kPa)	690	D751
Seam Strength = shear (kN/m)	10	D882
Seam Strength = peel (kN/m)	2.6	D882

PSLD.8.2.21 **Tank penetrations** Unit No.

The rate tendered shall include for the supply, installation and commissioning of all piping, specials, fittings, gaskets, bolts and all other components needed for complete penetrations through the tank and liner, typically for the inlet, outlet & dump drain. For these penetrations, all components to be galvanised steel to SANS 121 (ISO 1461:2009) or Grade 316 stainless steel to ASTM A240 and gaskets to be neoprene or similar. The nominal diameter of all penetrations shall be 100mm (101.6mm), all flanges to SABS 1123 and nuts, bolts and washers to be stainless steel. Penetrations shall be flanged each side or have a nozzle and/or strainer for inlet and outlet respectively.

All to Engineers approval.

PSLD.8.2.22 **Piping** Unit metres (m)

The rate tendered shall cover all delivery and outlet piping to the water storage tank. The piping shall all be nominal diameter 100mm (101.6mm), flanges to SABS 1123 in galvanised steel to SANS 121 (ISO 1461:2009) or Grade 316 stainless steel to ASTM A240, A312 & A269 as relevant. Including flanged or other couplings, gaskets, stainless steel bolts, nuts and washers, supports and adaptors. All as approved by the Engineer.

PSLD.8.2.23 **Valves** Unit No.

The rate tendered shall be for the supply, installation and commissioning of galvanised steel to SANS 121 (ISO 1461:2009) or stainless steel Grade 316 knife gate valves with Grade 316 stainless steel body and blade, PTFE O rings and seat, manually operated and with a nominal diameter of 100mm (101.6mm), flanged to SABS 1123 and nuts, bolts and washers to be stainless steel and inclusive of any gaskets and supports needed. The rate shall include for all components and fixings for an operating valve to the approval of the Engineer.

PSLE STORMWATER

PSLE-1 Scope

This Specification shall be expanded to cover all subsurface drainage installations as well as stormwater systems.

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PSLE-3 MATERIALS

PSLE-3.1 CULVERT UNITS AND PIPES

- ***Add the following:***

PSLE-3.1 f) Subsoil drain pipes

Subsoil drain pipes shall be "Drainex" type (or equal approved) HDPE slotted drainage pipe with smooth bore complying with DIN 4262 Part 1. Inclusive of all fittings such as junctions, bends and end caps.

PSLE-8 MEASUREMENT AND PAYMENT

PSLE.8.2.1 a) Supply & Lay Concrete Pipe Culverts Unit: m

In addition to the requirements of Clause LE 8.2.1, the rate tendered shall allow for all end units and cutting on site.

PSLE.8.2.1 b) Supply & Lay Drainex Subsurface Drainage Piping Unit: m

In addition to the requirements of Clause LE 8.2.1, the rate tendered shall allow for the complete supply, jointing and laying of the Drainex (or equal approved) subsoil drain piping, inclusive of all fittings such as junctions, bends and end caps.

PSLE.8.2.8 a) Supply & Install Brick Manholes Unit: No.

In addition to the requirements of Clause LE 8.2.8, the rate tendered shall allow for the complete construction of a brick manhole (bricks to be non-facing extra (NFX-E28 or equal approved, thoroughly burnt throughout, free from flaws, stones, cracks and unground lumps) including all cutting, waste, corbelling, over sailing and caulking of pipes into walls and mortar. Mortar shall be one part cement to 3 parts of sand. The manhole shall have a minimum internal dimension of 900mm, a heavy duty precast concrete cover and lid and be a minimum of 2,0m deep, or as specified. All excavation and backfilling shall be included in the rate tendered.

PSLE.8.2.8 b) Supply & Install Headwalls to Culverts Unit: No.

In addition to the requirements of Clause LE 8.2.8, the rate tendered shall allow for the complete construction of a brick headwall (bricks to be non-facing extra (NFX-E28 or equal approved, thoroughly burnt throughout, free from flaws, stones, cracks and unground lumps) including all cutting, waste, corbelling, over sailing and caulking of pipes into walls and mortar. Mortar shall be one part cement to 3 parts of sand. The headwall shall be for a minimum of a 750mm diameter pipe, or as specified. The minimum area of brickwork comprising the manhole shall be $6m^2$. All excavation and backfilling shall be included in the rate tendered.

The reinforced concrete base slab to the headwall shall be measured elsewhere.

PSLE.8.2.14 **Brickwork of the specified thickness** Unit: m^2

The rate shall include for all costs associated with the supply and laying of the nominal thickness of brickwork specified (bricks to be non-facing extra (NFX-E28 or equal approved, thoroughly burnt throughout, free from flaws, stones, cracks and unground lumps) all cutting, waste, corbelling, over sailing and caulking of pipes into walls and mortar. Mortar shall be one part cement to 3 parts of sand.

PSLE.8.2.15 **Cleaning of existing stormwater piping by pressure jetting** Unit: m^2

The rate tendered shall include for all plant, labour and materials to clean existing stormwater piping of between 300mm to 1100mm diameter inclusive, primarily using approved pressure jetting equipment or other approved means, including emptying / de silting etc at the manholes. The rate shall include for all removed material to be disposed of on the landfill as indicated,

C3.4: PARTICULAR SPECIFICATIONS

In addition to the Standardized and Project Specifications the following Particular Specifications / Policies shall apply to this contract:

C3.4.1 OHSA 1993 - SAFETY SPECIFICATION

PARTICULAR SPECIFICATION PAM: OHSA 1993 HEALTH AND SAFETY SPECIFICATION

CONTENTS

OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

PAM-1: SCOPE

This specification covers the health and safety requirements to be met by the Contractor to ensure a continued safe and healthy environment for all workers, employees and subcontractors under his control and for all other persons entering the site of works.

This specification shall be read with the Occupational Health and Safety Act (Act No 85 and amendment Act No 181) 1993, and the corresponding Construction Regulations 2003, and all other safety codes and specifications referred to in the said Construction Regulations.

In terms of the OHSA Agreement in Section C1.2.4 of the Contract document, the status of the Contractor as mandatory to the Employer (client) is that of an employer in his own right, responsible to comply with all provisions of OHSA 1993 and the Construction Regulations 2003.

This safety specification and the Contractor's own Safety Plan as well as the Construction Regulations 2003, shall be displayed on site or made available for inspection by all workers, employees, inspectors and any other persons entering the site of works.

The following are possible risks associated with this project:

- Working in the vicinity of potentially inflammable gas (methane).
- Potentially dangerous existing services, i.e. gas lines, water and sewerage mains, electrical high voltage cables, on the bridge, buried and overhead,
- Deep excavations in soils requiring shoring or reducing of slopes,
- Movement of construction vehicles on site, taking into consideration steep slopes, other traffic and existing services,
- Exposure to possible injuries due to mishandling or failure of power and hand tools,
- Risks related to general safety and security on site.

Additional risks may arise from specific methods of construction selected by the Contractor which are not necessary covered in the above.

PAM-2: DEFINITIONS

For the purpose of this contract the following shall apply:

(a) "**Employer**" where used in the contract documents and in this specification, means the Employer as defined in the General Conditions of Contract and it shall have the exact same meaning as "**client**" as defined in the Construction Regulations 2003. "**Employer**" and "**client**" is therefore interchangeable and shall be read in the context of the relevant document.

(b) "**Contractor**", wherever used in the contract documents and in this specification, shall have the same meaning as **"Contractor"** as defined in the General Conditions of Contract.

In this specification the terms **"principal contractor"** and **"contractor"** are replaced with **"Contractor"** and **"subcontractor"** respectively.

For the purpose of this contract the **Contractor** will, in terms of OHSA 1993, be the mandatary, without derogating from his status as an employer in his own right.

(c) "Engineer" **where used in this specification, means the Engineer as defined in the General Conditions of Contract. In terms of the Construction Regulations the Engineer may act as agent on behalf of the Employer (the client as defined in the Construction Regulations).**

PAM-3: TENDERS

The Contractor shall submit the following with his tender:

(a) a documented Health and Safety Plan as stipulated in Regulation 5 of the Construction Regulations. The Safety Plan must be based on the Construction Regulations 2003 and will be subject to approval by the Employer;

(b) a declaration to the effect that he has the competence and necessary resources to carry out the work safely in compliance with the Construction Regulations 2003;

(c) a declaration to the effect that he made provision in his tender for the cost of the health and safety measures envisaged in the Construction Regulations.

(d) Failure to submit the foregoing with his tender, will lead to the conclusion that the Contractor will not be able to carry out the work under the contract safely in accordance with the Construction Regulations.

PAM-4: NOTIFICATION OF COMMENCEMENT OF CONSTRUCTION WORK

After award of the contract, but before commencement of construction work, the Contractor shall, in terms of Regulation 3, notify the Provincial Director of the Department of Labour in writing if the following work is involved:

(a) the demolition of structures and dismantling of fixed plant of height of 3,0 m or more;

(b) the use of explosives;

(c) construction work that will exceed 30 days or 300 person-days;

(d) excavation work deeper than 1,0 m; or

(e) working at a height greater than 3,0 m above ground or landings.

The notification must be done in the form of the pro forma included under Section 9 (Forms to be Completed by Successful Tenderer) of the tender document.

A copy of the notification form must be kept on site, available for inspection by inspectors, Employer, Engineer, employees and persons on site.

PAM-5: RISK ASSESSMENT

Before commencement of any construction work during the construction period, the Contractor shall have a risk assessment performed and recorded in writing by a competent person. (Refer Regulation 7 of the Construction Regulations 2003).

The risk assessment shall identify and evaluate the risks and hazards that may be expected during the execution of the work under the contract, and it shall include a documented plan of safe work procedures to mitigate, reduce or control the risks and hazards identified.

The risk assessment shall be available on site for inspection by inspectors, Employer, Engineer, subcontractors, employees, trade unions and health and safety committee members, and must be monitored and reviewed periodically by the Contractor.

PAM-6: APPOINTMENT OF EMPLOYEES AND SUBCONTRACTORS

PAM-6.1 Health and Safety plan

The Contractor shall appoint his employees and any subcontractors to be employed on the contract, in writing, and he shall provide them with a copy of his documented Health and Safety Plan, or relevant sections thereof. The Contractor shall ensure that all subcontractors and employees are committed to the implementation of his Safety Plan.

PAM-6.2 Health and safety induction training

The Contractor shall ensure that all employees under his control, including subcontractors and their employees, undergo a health and safety induction training course by a competent person before commencement of construction work. No visitor or other person shall be allowed or permitted to enter the site of the works unless such person has undergone health and safety training pertaining to hazards prevalent on site.

The Contractor shall ensure that every employee on site shall at all times be in possession of proof of the health and safety induction training issued by a competent person prior to commencement of construction work.

PAM-7: APPOINTMENT OF SAFETY PERSONNEL

PAM-7.1: Construction Supervisor

The Contractor shall appoint a full-time **Construction Supervisor** with the duty of supervising the performance of the construction work.

He may also have to appoint one or more competent employees to assist the construction supervisor where justified by the scope and complexity of the works.

PAM-7.2: Construction safety officer

Taking into consideration the size of the project and the hazards or dangers that can be expected, the Contractor shall appoint in writing a full-time or part-time **Construction Safety Officer** if so decided by the Inspector of the Department of Labour. The Safety Officer shall have the necessary competence and resources to perform his duties diligently.

Provision shall be made by the Contractor in his rates, to cover the cost of this dedicated construction safety officer appointed after award of the contract.

PAM-7.3**:** **Health and safety representatives**

In terms of **Sections 17 and 18 of the Act (OHSA 1993)** the Contractor, being the employer in terms of the Act for the execution of the contract, shall appoint a **health and safety representative** whenever he has more than 20 employees in his employment on the site of the works. The health and safety representative must be selected from employees who are employed in a full-time capacity at a specific workplace.

The number of health and safety representatives for a workplace shall be at least one for every 100 employees.

The function of the health and safety representative(s) will be to review the effectiveness of health and safety measures, to identify potential hazards and major incidents, to examine causes of incidents (in collaboration with his employer, the Contractor), to investigate complaints by employees relating to health and safety at work, to make representations to the employer (Contractor) or inspector on general matters affecting the health and safety of employees, to inspect the workplace, plant, machinery etc. on a regular base, to participate in consultations with inspectors and to attend meetings of the health and safety committee.

PAM-7.4: **Health and safety committee**

In terms of **Sections 17 and 18 of the Act (OHSA 1993)** the Contractor (as employer), shall establish one or more **health and safety committee(s)** where there are two or more health and safety representatives at a workplace. The persons selected by the Contractor to serve on the committee shall be designated in writing.

The function of the health and safety committee shall be to hold meetings at regular intervals, but at least once every three months, to review the health and safety measures on the contract, to discuss incidents related to health and safety with the Contractor and the inspector, and to make recommendations regarding health and safety to the Contractor and to keep record of recommendations and reports made by the committee.

PAM-7.5: **Competent persons**

In accordance with the Construction Regulations the Contractor has to appoint in writing **competent persons** responsible for supervising construction work on each of the following work situations that may be expected on the site of the works.

(a) Risk assessment and induction training as described in Regulation 7 of the Construction Regulations;

(b) Fall protection as described in Regulation 8;

(c) Formwork and support work as described in Regulation 10;

(d) Excavation work as described in Regulation 11;

(e) Demolition work as described in Regulation 12;

(f) Scaffolding work as described in Regulation 14;

(g) Suspended platform operations as described in Regulation 15;

(h) Material hoists as described in Regulation 17;

(i) Batch plant operations as described in Regulation 18;

(j) Explosive powered tools as described in Regulation 19;

(k) Cranes as described in Regulation 20;

(l) Construction vehicle and mobile plant inspections on a daily basis by a competent person as described in Regulation 21(1);

(m) Control of all temporary electrical installations on the construction site as described in Regulation 22.

(n) Stacking and storage on construction sites as described in Regulation 26; and

(o) Inspections of fire equipment as described in Regulation 27.

A competent person may be appointed for more than one part of the construction work with the understanding that the person must be suitably qualified and able to supervise at the same time the construction work on all the work situations for which he has been appointed.

The appointment of competent persons to supervise parts of the construction work does not relieve the Contractor from any of his responsibilities to comply with **all** requirements of the Construction Regulations.

PAM-8: RECORDS AND REGISTERS

In accordance with the Construction Regulations the Contractor is bound to keep records and registers related to health and safety on site for periodic inspection by inspectors, the Engineer, the Employer, trade union officials and subcontractors and employees. The following records and registers must be kept on site and shall be available for inspection at all times.

(a) A copy of the OHSA 1993 Construction Regulations 2003;

(b) A copy of this Health and Safety Specification;

(c) A copy of the Contractor's Health and Safety Plan (Regulation 4);

(d) A copy of the Notification of Construction Work (Regulation 3);

(e) A health and safety file in terms of Regulation 5(7) with inputs by the Construction Safety Officer [Regulation 6(7)];

(f) A copy of the risk assessment described in Regulation 7;

(g) A full protection plan and the corresponding records of evaluation and training of employees working from elevated positions as described in Regulation 8;

(h) Drawings pertaining to the design of structures [Regulation 9(3)] and formwork and support work structures [Regulation 10(d)] must be kept on site;

(i) Pronouncement of the safety of excavations must be recorded in a register to be kept on site [Regulation 11(3)(h)];

(j) A copy of the certificate of the system design for suspended platforms [Regulation 15(3)];

(k) A notice must be affixed around the base towers of material hoists to indicate the maximum mass load, which may be carried at any one time by material hoists [Regulation 7(5)].

(l) Maintenance records of material hoists and inspection results must be kept in a record book to be kept on site [Regulation 17(8)];

(m) A record of any repairs to or maintenance of a batch plant must be kept on site [Regulation 18(9)];

(n) A warning notice must be displayed in a conspicuous manner when and wherever an explosive powered tool is used [Regulation 19(2)];

(o) A register for recording of findings by the competent person appointed to inspect construction vehicles and mobile plant [Regulation 21(1)(j)].

PAM-9: CONTRACTOR'S RESPONSIBILITIES

For this contract the Contractor will be the mandatory of the Employer (Client), as defined in the Act (OHSA 1993), which means that the Contractor has the status of employer in his own right in respect of the contract. The Contractor is therefore responsible for all the duties and obligations of an employer as set out in the Act (OHSA 1993) and the Construction Regulations 2003.

Before commencement of work under the contract, the Contractor shall enter into an agreement with the Employer (Client) to confirm his status as mandatory (employer) for the contract under consideration.

The Contractor's duties and responsibilities are clearly set out in the Construction Regulations 2003, and are not repeated in detail but some important aspects are highlighted hereafter, without relieving the Contractor of any of his duties and responsibilities in terms of the Construction Regulations.

(a) Contractor's position in relation to the Employer (Client) *(Regulation 4)*

In accordance with Section 4 of the Regulations, the Contractor shall liaise closely with the Employer or the Engineer on behalf of the Employer, to ensure that all requirements of the Act and the Regulations are met and complied with.

(b) The Principal Contractor and Contractor *(Regulation 5)*

The Contractor is in terms of the definition in Regulation 2(b) the equivalent of Principal Contractor as defined in the Construction Regulations, and he shall comply with all the provisions of Regulation 5.

Any subcontractors employed by the Contractor must be appointed in writing, setting out the terms of the appointment in respect of health and safety. An independent subcontractor shall however provide and demonstrate to the Contractor a suitable, acceptable and sufficiently documented health and safety plan before commencement of the subcontract. In the absence of such a health and safety plan the subcontractor shall undertake in writing that he will comply with the Contractor's safety plan, the health and safety specifications of the Employer and the Construction Regulations 2003.

(c) Supervision of construction work *(Regulation 6)*

The Contractor shall appoint the safety and other personnel and employees as required in terms of Regulation 6 and as set out in paragraph 7 above. Appointment of those personnel and employees does not relieve the Contractor from any of the obligations under Regulation 6.

(d) Risk assessment *(Regulation 7)*

The Contractor shall have the risk assessment made as set out in paragraph 7 above before commencement of the work, and it must be available on site for inspection at all times. The Contractor shall consult with the health and safety committee or health and safety representative(s) etc. on a regular basis to ensure that all employees, including subcontractors under his control, are informed and trained by a competent person regarding health hazards and related work procedures.

No subcontractor, employee or visitor shall be allowed to enter the site of works without prior health and safety induction training, all as specified in Regulation 7.

(e) Fall protection *(Regulation 8)*

Fall protection, if applicable to this contract shall comply in all respects with Regulation 8 of the Construction Regulations.

(f) Structures *(Regulation 9)*

The Contractor will be liable for all claims arising from collapse or failure of structures if he failed to comply with all the specifications, project specifications and drawings related to the structures, unless it can be proved that such collapse or failure can be attributed to faulty design or insufficient design standards on which the specifications and the drawings are based.

In addition the Contractor shall comply with all aspects of Regulation 9 of the Construction Regulations.

(g) Formwork and support work *(Regulation 10)*

The Contractor will be responsible for the adequate design of all formwork and support structures by a competent person.

All drawings pertaining to formwork shall be kept on site and all equipment and materials used in formwork, shall be carefully examined and checked for suitability by a competent person.

The provisions of Regulation 10 of the Construction Regulations shall be followed in every detail.

(h) Excavation work *(Regulation 11)*

It is essential that the Contractor shall follow the instructions and precautions in the Standard Specifications and Project Specifications as well as the provisions of the Construction Regulations to the letter as unsafe excavations can be a major hazard on any construction site. The Contractor shall therefore ensure that all excavation work is carried out under the supervision of a competent person, that inspections are carried out by a Professional Engineer or Technologist, and that all work is done in such a manner that no hazards are created by unsafe excavations and working conditions.

Supervision by a competent person will not relieve the Contractor from any of his duties and responsibilities under Regulation 11 of the Construction Regulations.

(i) Demolition work *(Regulation 12)*

Whenever demolition work is included in a contract, the Contractor shall comply with all the requirements of Regulation 12 of the Construction Regulations. The fact that a competent person has to be appointed by the Contractor, does not relieve the Contractor from any of his responsibilities in respect of safety of demolition work.

(j) Tunnelling *(Regulation 13)*

The Contractor shall comply with Regulation 13 wherever tunnelling of any kind is involved.

(k) Scaffolding *(Regulation 14)*

The Contractor shall ensure that all the provisions of Regulation 14 of the Construction Regulations are complied with. [*Note : Reference in the Regulations to "Section 44 of the Act" should read "Section 43 of the Act"]*

(l) Suspended platforms *(Regulation 15)*

Wherever suspended platforms will be necessary on any contract, the Contractor shall ensure that copies of the system design issued by a Professional Engineer are submitted to the Engineer for inspection and approval. The Contractor shall appoint competent persons as supervisors and competent scaffold erectors, operators and inspectors and ensure that all work related to suspended platforms are done in accordance with Regulation 15 of the Construction Regulations.

(m) Boatswain's chairs *(Regulation 16)*

Where boatswain's chains are required on the construction site, the Contractor shall comply with Regulation 16.

(n) Material Hoists *(Regulation 17)*

Wherever applicable, the Contractor shall comply with the provisions of Regulation 17 to the letter.

(o) Batch plants *(Regulation 18)*

Wherever applicable, the Contractor shall ensure that all lifting machines, lifting tackle, conveyors, etc. used in the operation of a batch plant shall comply with, and that all operators, supervisors and employees are strictly held to the provisions of Regulation 18. The Contractor shall ensure that the General Safety Regulations (Government Notice R1031 of 30 May 1986), the Driven Machinery Regulations (Government Notice R295 of 26/2/1988) and the Electrical Installation Regulations (Government Notice R2271 of 11/10/1995) are adhered to by all involved.

In terms of the Regulations, records of repairs and maintenance shall be kept on site.

(p) Explosive powered tools *(Regulation 19)*

The Contractor shall ensure that, wherever explosive-powered tools are required to be used, all safety provisions of Regulation 19 are complied with.

It is especially important that warning notices are displayed and that the issue and return of cartridges and spent cartridges be recorded in a register to be kept on site.

(q) Cranes *(Regulation 20)*

Wherever the use of tower cranes becomes necessary, the provisions of Regulation 20 shall be complied with.

(r) Construction vehicles and mobile plant *(Regulation 21)*

The Contractor shall ensure that all construction vehicles and plant are in good working condition and safe for use, and that they are used in accordance with their design and intended use. The vehicles and plant shall only be operated by workers or operators who have received appropriate training, all in accordance with all the requirements of Regulation 21.

All vehicles and plant must be inspected on a daily basis, prior to use, by a competent person and the findings must be recorded in a register to be kept on site.

(s) Electrical installation and machinery on construction sites *(Regulation 22)*

The Contractor shall comply with the Electrical Installation Regulations (Government Notice R2920 of 23 October 1992) and the Electrical Machinery Regulations (Government Notice R1953 of 12 August 1993). Before commencement of construction, the Contractor shall take adequate steps to ascertain the presence of, and guard against dangers and hazards due to electrical cables and apparatus under, over or on the site.

All temporary electrical installations on the site shall be under the control of a competent person, without relieving the Contractor of his responsibility for the health and safety of all workers and persons on site in terms of Regulation 22.

(t) Use of temporary storage of flammable liquids on construction sites *(Regulation 23)*

The Contractor shall comply with the provisions of the General Safety Regulations (Government Notice R1031 of 30 May 2986) and all the provisions of Regulation 23 of the Construction Regulations to ensure a safe and hazard-free environment to all workers and other persons on site.

(u) Water environments *(Regulation 24)*

Where construction work is done over or in close proximity to water, the provisions of Regulation 24 shall apply.

(v) Housekeeping on Construction sites *(Regulation 25)*

Housekeeping on all construction sites shall be in accordance with the provisions of the environmental Regulations for workplaces (Government Notice R2281 of 16 October 1987) and all the provisions of Regulation 25 of the Construction Regulations.

(w) Stacking and storage on construction sites *(Regulation 26)*

The provisions for the stacking of articles contained in the General Safety Regulations (Government Notice R1031 of 30 May 1986) as well as all the provisions of Regulation 26 of the Construction Regulations shall apply.

(x) Fire precautions on construction sites *(Regulation 27)*

The provisions of the Environmental Regulations for Workplaces (Government Notice R2281 of 16 October 1987) shall apply.

In addition the necessary precautions shall be taken to prevent the incidence of fires, to provide adequate and sufficient fire protection equipment, sirens, escape routes etc. all in accordance with Regulation 27 of the Construction Regulations.

(y) Construction welfare facilities *(Regulation 28)*

The Contractor shall comply with the construction site provisions as in the Facilities Regulations (Government Notice R1593 of 12 August 1988) and the provisions of Regulation 28 of the Construction Regulations.

(z) Non-compliance with the Construction Regulations 2003

The foregoing is a summary of parts of the Construction Regulations applicable to all construction projects.

The Contractor, as employer for the execution of the contract, shall ensure that all provisions of the Construction Regulations applicable to the contract under consideration are complied with to the letter.

Should the Contractor fail to comply with the provisions of the Regulations 3 to 28 as listed in Regulation 30, he will be guilty of an offence and will be liable, upon conviction, to the fines or imprisonment as set out in Regulation 30.

The Contractor is advised in his own interest to make a careful study of the Act and the Construction Regulations as ignorance of the Act and the Regulations will not be accepted in any proceedings related to non-conformance to the Act and the Regulations.

PAM-10: MEASUREMENT AND PAYMENT

PAM-10.1:	**Scheduled Item**	**Unit**
	Contractor's obligations in respect of the Occupational Health and Safety Act	**Lump Sum**

Payment of the lump sum tendered in the Preliminary & General item shall include full compensation for all costs resulting from the Contractor's specified obligations in respect of fulfilling his obligations in respect of the Occupational Health and Safety Act.

Payment of the sum tendered will be made in two instalments, as follows:

The first instalment, 50% of lump sum, will be paid after the Contractor has submitted a Health and Safety plan in accordance with the specifications.

The second instalment, 50% of the lump sum, will be paid after the issuing of the Completion Certificate and the submission of the Health and Safety file.

(a) Safety personnel

The Construction Supervisor, the Construction Safety Officer, Health and Safety Representatives, Health and Safety Committee and Competent Persons referred to in clauses PAM-7.1 to 7.5 shall be members of the Contractor's personnel, and no additional payment will be made for the appointment of such safety personnel.

(b) Records and Registers,

The keeping of health and safety-related records and registers as described in PAM-8 is regarded as a normal duty of the Contractor for which no additional payment will be considered, and which is deemed to be included in the Contractor's tendered rates and prices.

C3.4.2 ENVIRONMENTAL MANAGEMENT SPECIFICATION

CONTENTS

ENVIRONMENTAL MANAGEMENT SPECIFICATION

1. PURPOSE

The purpose of the EMP is to encourage good management practices through planning and commitment with respect to environmental issues, and to provide rational and practical environmental guidelines to minimise disturbance of the natural environment.

2. RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT

The contractor will be responsible for environmental control on site during construction and the maintenance period. The construction activities will be monitored by an independent environmental specialist and audited against the EMP.

3. TRAINING AND INDUCTION OF EMPLOYEES

The contractor has a responsibility to ensure that all those people involved in the project are aware of and familiar with the environmental requirements for the project (this includes sub-contractors, casual labour, etc.).

4. COMPLAINTS REGISTER AND ENVIRONMENTAL INCIDENT BOOK

Any complaints received by the project team from the community will be recorded. The complaint will be brought to the attention of the site manager.

All complaints received will be investigated and a response given to the complainant within 28 days.

All environmental incidents occurring on the site will also be recorded.

5. ENVIRONMENTAL SAFETY

The management of impacts associated with various categories of concern is discussed as separate topics, indicated below.

5.1 Soil

(a) Topsoil should be temporarily stockpiled, separately from (clay) subsoil and rocky material, when areas are cleared. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost.

(b) Stockpiled topsoil should not be compacted and should be replaced as the final soil layer. No vehicles are allowed access onto the stockpiles after they have been placed.

(c) Stockpiled soil should be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season. The need for such measures will be indicated in the site-specific report.

(d) Topsoil stripped from different sites must be stockpiled separately and clearly identified as such. Topsoil obtained from sites with different soil types must not be mixed.

(e) Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and micro-organisms in the soil.

(f) Soil must not be stockpiled on drainage lines or near watercourses without prior consent from the Project Manager.

(g) Soil should be exposed for the minimum time possible once cleared of invasive vegetation, that is the timing of clearing and grubbing should be co-ordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion. Stockpiled topsoil must be either vegetated with indigenous grasses or covered with a suitable fabric to prevent erosion and invasion by weeds.

(h) Limited vehicular access is allowed across rocky outcrops and ridges.

(i) All cut and fill surfaces need to be stabilized with appropriate material or measures when major civil works are complete.

(j) Erosion and donga crossings must be dealt with as river crossings. Appropriate soil erosion and control procedures must be applied to all embankments that are disturbed and destabilized.

(k) All equipment must be inspected regularly for oil or fuel leaks before it is operated. Leakages must be repaired on mobile equipment or containment trays placed underneath immobile equipment until such leakage has been repaired.

(l) Soil contaminated with oil must be appropriately treated and disposed of at a permitted landfill site or the soil can be regenerated using bio-remediation methods.

(m) Runoff must be reduced by channelling water into existing surface drainage system.

5.2 Water

(a) Adequate sedimentation control measures must be instituted at any river crossings when excavations or disturbance of a riverbanks or riverbeds takes place.

(b) Adequate sedimentation control measures must be implemented where excavations or disturbance of drainage lines of a wetland may take place.

(c) All fuel, chemical, oil, etc spills must be confined to areas where the drainage of water can be controlled. Use appropriate structures and methods to confine spillages such as the construction of berms and pans, or through the application of surface treatments that neutralise the toxic effects prior to the entry into a water course.

(d) Oil absorbent fibres must be used to contain oil spilt in water.

(e) During construction through a wetland, the majority of the flow of the wetland should be allowed to pass downstream.

(f) Vehicular traffic across wetland areas must be avoided.

(g) No dumping of foreign material in streams, rivers and/or wetland areas is allowed.

(h) The wetland area and/or river must not be drained, filled or altered in any way including alteration of a bed and/or, banks, without prior consent from the DWAF. The necessary licenses must be obtained in terms of Section 21 and 22 of the National Water Act, 36 of 1998 from DWAF.

(i) No fires or open flames are allowed in the vicinity of the wetland, especially during the dry season.

(j) No swimming, washing (including vehicles and equipment), fishing or related activity is permitted in a wetland or river without written permission from the Project Manager.

(k) Disturbances to nesting, breeding and roaming sites of animals in or adjacent to wetland areas must be minimized.

5.3 Air

Speed limits must be implemented in all areas, including public roads and private property to limit the levels of dust pollution.

Dust must be suppressed on access roads and construction sites during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that must not result in the generation of run-off.

The site-specific investigation will quantify the impact of dust on nearby wetlands, rivers and dams in terms of sedimentation. Mitigation measures identified during the site specific study must be implemented.

The Contractor must notify the Principal of all schools within 50m of the site of proposed activities. The Principal must in turn ensure that children with allergies and respiratory ailments take the necessary precautionary measures during the construction period. The Contractor must ensure that construction activities do not disturb school activities e.g. dust clouds may reduce visibility affecting sports activities.

Waste must be disposed of, as soon as possible at a municipal transfer station, skip or on a permitted landfill site. Waste must not be allowed to stand on site to decay, resulting in malodours.

Noise control measures must be implemented. All noise levels must be controlled at the source. All employees must be given the necessary ear protection gear. IAP's must be informed of the excessive noise factors.

The Contractor must inform all adjacent landowners of any after-hour construction activities and any other activity that could cause a nuisance e.g. the application of chemicals to the work surface. Normal working hours must be clearly indicated to adjacent land owners.

No loud music is allowed on site and in construction camps.

No fires are allowed if smoke from such fires will cause a nuisance to IAP's.

5.4 Social and Cultural

(a) Access by non-construction people onto any construction sites must be restricted. The Contractors activities and movement of staff must be restricted to designated construction areas only.

(b) The Contractors crew must be easily identifiable due to clothing, identification cards or other methods.

(c) Rapid migration of job seekers could lead to squatting and social conflict with resident communities and increase in social pathologies if not properly addressed. The Contractor must ensure that signs indicating the availability of jobs are installed.

(d) Criteria for selection and appointment (by the Contractor) of construction labour must be established to allow for preferential employment of local communities. The Local Authority must be actively involved in the process of appointing temporary labourers.

(e) Sub-Contractors and their employees must comply with all the requirements of this document and supporting documents e.g. the Contract document that applies to the Contractor. Absence of specific reference to the sub-contractor in any specification does not imply that the sub-contractor is not bound by this document.

(f) No member of the construction workforce is allowed to wander around private property, except within the immediate surroundings of the site.

(g) The Contractor must provide suitable sanitation facilities for site staff. Sanitation provided during the construction phase should be managed so that it does not cause environmental health problems. The use of the surrounding veld for toilet purposes is not permitted under any circumstance.

(h) The Contractor must arrange for all his employees and those of his sub-contractors to be informed of the findings of the environmental report before the commencement of construction to ensure:

- A basic understanding of the key environmental features of the work site and environments, and
- Familiarity with the requirements of this document and the site specific report.

(i) Supervisory staff of the Contractor or his sub-contractors must not direct any person to undertake any activities which would place such person in contravention of the specifications of this document, endanger his/her life or cause him/her to damage the environment.

(j) The demand for construction materials and supplies will have an effect on the local economy. This impact can be optimised by sourcing and purchasing materials locally and regionally wherever possible, insofar as the material complies with the design specification.

(k) The Contractor must maintain a detailed complaints register. This must be forwarded, together with solutions, to the authorities when requested.

5.5 Aesthetics

(a) Scenic Quality

Damage to the natural environment must be minimized.

Trees and tall woody shrubs must be protected from damage to provide a natural visual shield. Excavated material must not be placed on such plants and movement across them must not be allowed, as far as practical.

The clearing of all sites must be kept to a minimum and surrounding vegetation must, as far as possible, be left intact as a natural shield.

No painting or marking of natural features must be allowed.

(b) All above ground structures could be treated or painted to blend in with the natural environment.

(c) Cut and fill areas, river and stream crossings and other soil stabilisation works must be constructed to blend in with the natural environment.

(d) Natural outcrops, rocky ridges and other natural linear features, must not be bisected. Vegetation on such features must, as far as possible, not be cut unless absolutely necessary for construction.

(e) Excavated material must be flattened (not compacted) or removed from site. No heaps of spoil material must be left on site once the Contractor has moved to a new construction site.

(f) Any complaints from interest groups regarding the appearance of the construction site must be recorded and addressed promptly by the Contractor.

5.6 Archaeology and Cultural Sites

(a) All finds of human remains must be reported to the nearest police station.

(b) Human remains from the graves of victims of conflict, or any burial ground or part thereof which contains such graves and any other graves that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed or removed from their original positions without a permit from the South African Heritage and Resource Agency (SAHRA).

(c) Work in areas where artefacts are found must cease immediately.

(d) Under no circumstances must the Contractor, his/her employees, his/her sub-contractors or his/her sub-contractors' employees remove, destroy or interfere with archaeological artefacts. Any person who causes intentional damage to archaeological or historical sites and/or artefacts could be penalised or legally prosecuted in terms of the National Heritage Resources Act, 25 of 1999.

(e) A fence at least 2 m outside the extremities of the site must be erected to protect archaeological sites.

(f) All known and identified archaeological and historical sites must be left untouched.

(g) Work in the area can only be resumed once the site has been completely investigated. The Project Manager will inform the Contractor when work can resume.

5.7 Flora

(a) All suitable and rare flora and seeds must be rescued and removed from the site. They must be suitably stored, for future use in rehabilitation.

(b) The felling and/or cutting of trees and clearing of bush must be minimised.

(c) Bush must only be cleared to provide essential access for construction purposes.

(d) The spread of alien vegetation must be minimized.

(e) Any incident of unauthorised removal of plant material, as well as accidental damage to priority plants, must be documented by the Contractor.

(f) Woody vegetative matter stripped during construction must either be spread randomly throughout the surrounding veld so as to provide biomass for other micro-organisms and habitats for small mammals and birds, or it may be stockpiled for later redistribution over the reinstated topsoiled surface. No vegetative matter must be burnt or removed for firewood other than those removed during the grubbing and clearing phase. Such vegetation can be made available to the local inhabitants to be used as firewood.

(g) No tree outside the footprint of the Works area must be damaged.

5.8 Fauna

(a) No species of animal may be poached, snared, hunted, captured or wilfully damaged or destroyed.

(b) Snakes and other reptiles that may be encountered on the construction site must not be killed unless the animal endangers the life of an employee.

(c) Anthills and/or termite nests that occur must not be disturbed unless it is unavoidable for construction purposes.

(d) Disturbances to nesting sites of birds must be minimized.

(e) The Contractor must ensure that the work site is kept clean and free from rubbish, which could attract pests.

5.9 Infrastructure

(a) The relevant authorities must be notified of any interruptions of services, especially the Local Municipality, National Road Agency, Spoornet, TELKOM and ESKOM. In addition, care must be taken to avoid damaging major and minor pipelines and other services.

(b) The integrity of property fences must be maintained.

(c) No telephone lines must be dropped during the construction operations, except were prior agreement by relevant parties is obtained. All crossings must be protected, raised or relocated as necessary.

(d) All complaints and/or problems related to impacts on man-made facilities and activities must be promptly addressed by the Contractor and documented.

(e) Storage Facilities

- Proper storage facilities should be provided for the storage of oils, grease, fuels, chemicals and hazardous materials.
- The Contractor must ensure that accidental spillage does not pollute soil and water resources.
- Fuel stock reconciliation must be done on all underground tanks to ensure no loss of oil, which could pollute groundwater resources.
- Cement must be stored and mixed on an impermeable substratum.

(f) Traffic Control

All reasonable precautions must be taken during construction to avoid severely interrupting the traffic flow on existing roads, especially during peak periods.

Before any work can start the Local Traffic Department must be consulted about measures to be taken regarding pedestrian and vehicular traffic control.

(g) Access Roads

The Contractor and the affected landowner must collaborate on the planning and construction of new access routes and the repair or upgrading of existing routes.

Access to the site must be controlled such that only vehicles and persons directly associated with the work gains access to the site.

Temporary access roads must not be opened until required and must be restored to its former state as soon as the road is no longer needed.

(h) Batching Plants

Concrete must be mixed only in an area demarcated for this purpose. All concrete spilled outside this area, must be promptly removed by the Contractor and taken to a permitted waste disposal site. After all concrete mixing is complete, all waste concrete must be removed from the batching area and disposed of at an approved dumpsite. Stormwater must not be allowed to flow through the batching area. Water laden with cement must be collected in a retention area for evaporation and not allowed to escape the batching area. Operators must wear suitable safety clothing.

(i) Chemical toilet facilities should be managed and serviced by a qualified company. No disposal or leakage of sewerage should occur on or near the site.

(j) Blasting

Blasting must not endanger public or private property.

Noise mufflers and/or soft explosives must be used to minimize the impact on animals.

All the provisions of the Explosives Act, 26 of 1956 and the Minerals Act, 50 of 1991 must be complied with.

The Contractor must take measures to limit flyrock.

5.10 Safety

(a) Measures must be taken to prevent any interference that could result in flashover of power lines due to breaching of clearances or the collapse of power lines due to collisions by vehicles and equipment.

(b) Measures must be taken during thunderstorms to protect workers and equipment from lightning strikes.

(c) All tall structures must be properly earthed and protected against lightning strikes.

(d) The process of excavation and back filling must be carried out as a sequential process following one another as quickly as possible. Excavations must only remain open for a minimum period of time and during this time they must be clearly demarcated. If excavations place the public at risk these sites must be fenced.

(e) The residents directly affected by open trenches must be notified of the dangers. This will be done during the site-specific phase.

5.11 Waste

Solid Waste

(a) Littering on site and the surrounding areas is prohibited.

(b) Clearly marked litterbins must be provided on site. The Contractor must monitor the presence of litter on the work sites as well as the construction campsite.

(c) All bins must be cleaned of litter regularly.

(d) All waste removed from site must be disposed at a municipal/permitted waste disposal site.

(e) Excess concrete, building rubble or other material must be disposed of in areas designated specifically for this purpose and not indiscriminately over the construction site.

(f) The entire works area and all construction sites must be swept of all pieces of wire, metal, wood or other material foreign to the natural environment.

(g) Contaminated soil must be treated and disposed of at a permitted waste disposal site, or be removed and the area rehabilitated immediately.

(h) Waste must be recycled wherever possible.

Liquid Waste

(a) The Contractor must maintain mobile toilets on site.

(b) The Contractor must provide adequate and approved facilities for the storage and recycling of used oil and contaminated hydrocarbons. Such facilities must be designed and sited with the intention of preventing pollution of the surrounding area and environment.

(c) All vehicles must be regularly serviced in designated area within the Contractors camp such that they do not drip oil.

(d) All chemical spills must be contained and cleaned up by the supplier or professional pollution control personnel. Run-off from wash bays must be intercepted.

Hazardous Waste

(a) No hazardous materials must be disposed of in the veld or anyplace other than a registered landfill for hazardous material. Hazardous waste must be stored in containers with tight lids that must be sealed and must be disposed at an appropriately permitted hazardous waste disposal site. Such containers must not be used for purposes other than those originally designed for.

(b) The Contractor must maintain a hazardous material register.

5.12 Rehabilitation and Site clearance

(a) When all major construction activities are completed, the site must be inspected to determine site-specific rehabilitation measures. This may be considered as unplanned work e.g. soil rehabilitation due to oil spills.

(b) All temporary buildings and foundations, equipment, lumber, refuse, surplus materials, waste, construction rubble fencing and other materials foreign to the area must be removed.

(c) If waste products cannot be recycled they must be disposed of at a permitted landfill site.

(d) All drainage deficiencies including abandoned pit latrines and waste pits must be corrected.

(e) Cut and fill areas must be restored and re-shaped.

(f) The area must be restored to its natural vegetation condition using indigenous trees, shrubs and grasses as directed by a grassland and/or rehabilitation expert.

(g) Borrow pits must be re-shaped into even slopes and surfaces to blend with the natural terrain and topsoil must be replaced.

(h) The grass mix, shrubs and trees used for rehabilitation must be compatible with the species identified in the site-specific investigation.

(i) Areas compacted by vehicles during construction must be scarified to allow penetration of plant roots and the regrowth of natural vegetation.

6. MEASUREMENT AND PAYMENT

No additional payment will be made to the Contractor to comply with the above actions as it will be deemed to be included in the rates tendered.

C3.4.3 PARTICULAR SPECIFICATION PAA: DAYWORK SCHEDULE

CONTENTS

PARTICULAR SPECIFICATION PAA: DAYWORK SCHEDULE

PAA-1 GENERAL

In cases where the Engineer orders any variation in the form, quality or quantity of the work or any extra work to such an extent that the tendered rates for specific items are no longer applicable, or where a combination of tendered rates cannot be applied to compensate for such work, the Engineer may, in terms of the General Conditions of Contract, order that the amended or extra work be carried out as daywork at the cost of labour, plant and materials. For that purpose provision is made for the Contractor to tender his rates for labour and plant in the Daywork Schedule which forms part of this contract.

No work will be measured as daywork unless:

(a) the Engineer agrees that the varied work is not in accordance with the specification or scope of a measured item in the contract;

(b) the Engineer has issued an order in writing for the execution of such varied work; and

(c) statements of plant and labour are submitted daily to the Engineer for his consideration and approval.

All work valued at the tendered rates in the Daywork Schedule will be subject to contract price adjustment as applicable to the Contract.

PAA-2 SALARIES AND WAGES OF WORKMEN

The amount to be paid for labour will be based on the rates tendered in the Daywork Schedule for the workers executing the work. The tendered rates shall be all-inclusive and shall be held to cover all charges for the Contractor's profits, timekeeping, clerical work, insurance, establishment, superintendence, the use of hand tools, etc, and no additional surcharge over and above the tendered rates will be applicable.

PAA-3 CONSTRUCTIONAL PLANT

The rates for constructional plant as tendered in the Daywork Schedule shall cover all costs, overheads and profit for the contractor and no further surcharge will be payable on the tendered rates. The cost of operators shall be included in the tendered rates except where otherwise specified in Clause PAA-5 (Measurement and Payment) hereafter.

Where plant or equipment for which no rates exist in the Daywork schedule are employed, the cost thereof shall be determined as agreed with the Engineer in terms of the General Conditions of Contract. In such case contract price adjustment will only be applicable if the agreed cost is based on rental rates at the time of the base month before closing of tenders, or if the ruling rates current at the time of the execution of the work are de-escalated to the base month.

The Contractor will be paid for the transport to and from the site of constructional plant not on site and specially ordered by the Engineer to be brought on site. No payment will be made for transport of equipment listed in the Contractor's Schedule of Constructional Plant in the tender document, or for equipment which has been removed from the site on request of the Contractor, or for equipment already on site, regardless of whether it appears on the Schedule of Constructional plant or not.

PAA-4 MATERIALS

Materials required for daywork items which cannot be compensated under existing rates and have to be purchased, will be paid for at cost, excluding VAT, plus a surcharge of 15%. The cost of materials provided for daywork at current rates at the time when the work is executed, will not be subject to contract price adjustment unless the prices of the materials are de-escalated to the base month for escalation.

PAA-5 MEASUREMENT AND PAYMENT

Item		Unit
PAA-5.1	Labour	
(a)	Unskilled workers	hour (h)
(b)	Skilled workers (Artisans)	hour (h)
(c)	Operators and drivers (where measured separately)	hour (h)
(d)	Foremen	hour (h)
(e)	Others (specify)	hour (h)

The unit of measurement is the hour or part thereof during which workers were engaged in daywork.

The tendered rate shall include full compensation for all salaries, wages, bonuses, pension, insurance, medical aid and other benefits as well as overheads arising from administrative personnel, site agents, supervisors, tools and profit. No surcharge will be paid on the tendered rates

The cost of operators included in the rates for constructional plant, will not be measured again under Labour.

Item		Unit
PAA-5.2	Constructional Plant	
(a)	Lowbed transport of plant to and from the site	ton-kilometre (t.km)
(b)	Bulldozer and ripper	
(i)	..... (Specify power and mass)	hour (h)
(ii)	..... etc (for other bulldozers)	hour (h)
(c)	Grader	
(i)	..... (Specify power and mass)	hour (h)
(ii)	..... etc (for other graders)	hour (h)
(d)	Front-end loaders	
(i)	..... (Specify type, power and mass)	hour (h)
(ii)	..... etc (for other front-end loaders)	hour (h)

(e) Back-acting excavators

(i) ..... (Specify type, power and mass) hour (h)
(ii) ..... etc (for other back-acting excavators) hour (h)

(g) Compactors

(i) ..... (Specify type and mass) hour (h)
(ii) ..... etc (for other types and masses) hour (h)

(h) Compressors

(i) ..... (Specify capacity and number of tools) hour (h)
(ii) ..... etc (for other compressors and tools) hour (h)

(i) Trucks

(i) ..... (Specify type, and capacity) hour (h)
(ii) ..... etc (for other trucks) hour (h)

(j) Light delivery vehicles

(i) ..... (Specify load capacity) kilometre (km)
(ii) ..... etc (for other) kilometre (km)

Item Unit

PAA-5.3 Cost of materials delivered to site (specify) …… Provisional sum or as scheduled

The unit of measurement for subitem 5.2(a) is the ton constructional equipment multiplied by the kilometre distance over which the plant has been transported with a lowbed transporter as ordered by the Engineer.

The unit of measurement for subitems 5.2(b) to (i) is the hour or part thereof during which the item of plant had been in active use for the daywork operation, including stopping time of less than five minutes.

Where applicable travel time to and from the normal parking position on site, or the position of the most recent non-daywork activity, as well as stopping time exceeding five minutes shall be multiplied by a factor of 0,6. Time shall be measured by means of a vibrating clock card.

The unit of measurement for subitem 5.2(j) is the kilometre travelled to collect or transport small quantities of materials. Kilometres travelled in light delivery vehicles by supervisors in the execution of normal supervisional duties, shall not be measured for payment.

The tendered rates shall include full compensation for the supply, maintenance, service, repairs, depreciation as well as fuel, lubricants, licensing, insurance, overheads and profit. It shall also include the cost of drivers and operators except in the case of subitem PAA-5.2(h) where the operators of tools are paid for under labour.

C3.4.4 PART LGC : GEOSYNTHETIC CLAY LINER (GCL)

CONTENTS

Clause

LGC.1 SCOPE

This specification covers the supply and installation of a Geosynthetic Clay Liner for the lining of an extension to the Transfer Area lining at the municipal waste landfill at Bisasar Road. It does not include earthworks or protection layer or drainage systems which are covered separately.

Supporting specifications are GRI GCL3 REV 5 Table 1 (a).

LGC.2 INTERPRETATIONS

LGC.2.1 Definitions

For the purposes of this Specification, the following definitions shall apply :

Any reference to the “liner”, “lining” or “geosynthetic clay liner” shall be deemed to refer to the **Geosynthetic Clay Liner** to the base and side slopes of the Landfill.

LGC.3 MATERIAL & MANUFACTURING

LGC.3.1 Manufacture

The GCL shall be manufactured by mechanically bonding the cover and carrier geotextiles using a needle-punching process to enhance frictional and internal shear strength characteristics. In order to maintain these characteristics, no glues, adhesives or other non-mechanical bonding processes shall be used instead of the needle-punching process.

No manufacturing techniques will be approved unless it can be suitably demonstrated that the GCL exhibits uniform shear strength characteristics across the entire width of the panel. Isolated sewn, stitched or stapled rows do not constitute uniform reinforcement for the purposes of this specification.

To ensure correct jointing between adjacent GCL panels, the GCL shall be factory bentonite impregnated along both top long edges to enable self-sealing along these edges. This impregnation shall extend some 500mm (minimum 300mm) from the edges of the roll, in the long direction.

A minimum overlap guideline shall be imprinted with non-toxic ink on both long edges of the GCL roll to ensure the accuracy of overlap seams. These lines shall be used during Construction Quality Assurance procedures, to ensure the minimum overlap is achieved. The minimum overlap guideline shall indicate where the edge of the panel must be placed in order to achieve a full 300mm of bentonite overlap for each panel.

The minimum acceptable dimensions for the GCL panels shall be 4,5m wide and 30m long. Short rolls (rolls less than 30m long) may be supplied, but at a rate not to exceed 5% of the total product area produced for this project.

To demonstrate the uniformity of the manufacturing process, no delamination of the geotextile components from the bentonite core shall occur when the GCL is immersed in tap water at ambient temperature for one hour.

The manufacturer shall submit certified test results and statements of quality for the proposed GCL to the Engineer, indicating without exception that the proposed GCL meets the requirements of this specification.

LGC.3.2 Packaging and Identification

All GCL rolls shall be packaged in opaque moisture resistant plastic sleeves. The roll cores shall be sufficiently strong to resist collapse during transit and handling.

Before shipment, the manufacturer shall label each roll, both on the GCL roll and on the surface of the plastic protective sleeve. Labels shall be resistant to fading and moisture degradation to ensure legibility at the time of the installation. At a minimum the roll labels shall identify the following:

Product Name and Grade

Length and width of roll

Total weight of roll

Production Lot number and individual roll number

LGC.3.3 GCL Specification

The GCL shall comply with GRI GCL 3 Rev 5, specifically Table 1 (a) and the table below.

TABLE LGC 3.1 : GCL NOMINAL SPECIFICATIONS

Material Property		Unit	Required Value	Test Method
GEOTEXTILE PROTECTION LAYER	PP non-woven	g/m²	200	ASTM 5261
GEOTEXTILE CARRIER LAYER	PP slit film woven	g/m²	110	
	PP non-woven	g/m²	200	
	Composite	g/m²	310	
BENTONITE LAYER (Bentonite mass at 15% moisture content max.)	Sodium Bentonite	g/m²	3700	ASTM D5993
	Fluid Loss	ml	≤ 15	ASTM D5891
	Swell Index (2g/100ml/24h)	ml/2g	≥ 24	ASTM D5890
MASS PER UNIT AREA	GCL	g/m²	4210	ASTM D5993
BONDING PROCESS		Fully Needle-punched		
GRAB STRENGTH	MACHINE	N	1500	ASTM D4632
	ACROSS	N	1500	
PEEL STRENGTH		N/m	450	ASTM D6496
CBR BURST	STRENGTH	N	≥ 2500	AS 3706.4 ISO 12236
	ELONGATION	%	≥ 40	
HYDRAULIC CONDUCTIVITY		m/s	≤ 3 x 10^{-11}	ASTM D5887
HYDRATED INTERNAL SHEAR STRENGTH (Peak value measured at 30 kPa normal stress)		kPa	≥ 45	ASTM D6243
ROLL SIZE (MIN)		Length (m)	30	

Auxiliary Products

Any accessory bentonite used for sealing seams, penetrations, or repairs, shall be high-quality powdered sodium bentonite from a recognised producer and must comply with the specifications set in Table LGC.3.1. Equal alternatives will be considered.

LGC.3.4 Handling of materials

The Contractor shall contact the supplier before shipment to determine if the unloading methods and equipment differs from that specified below. Significant deviations from these procedures shall be pre-approved by the Engineer.

GCL's must be supported during handling to ensure worker safety and to prevent damage to the product. Under no circumstances may the rolls be dragged, lifted from one end, lifted with only the forks of a lift truck or dropped on to the ground from the delivery vehicle.

The CQA personnel shall verify that proper handling equipment exists which does not pose any danger to installation personnel or risk of damage or deformation to the liner material itself. Suitable handling equipment is described below:

Spreader Bar Assembly - A spreader bar assembly shall include a core pipe or bar and a spreader bar beam. The core pipe shall be used to uniformly support the roll when inserted through the GCL core while the spreader bar beam will prevent chains or straps from chafing the roll edges.

Carpet Spike - A carpet spike is a rigid pipe or rod with one end directly connected to a forklift or other handling equipment and the other end rounded off to allow easy insertion into roll material cores. If a carpet spike is used, it must be at least 3,0m long and inserted to its full length into the roll core to prevent excessive bending of the roll when lifted 75mm apart, which both support the GCL roll and allow it to unroll freely. The use of roller cradles will be permitted if the rollers support the entire width of the GCL roll.

Straps - Straps may be used to support the ends of spreader bars but are not recommended as the primary support mechanism. As straps may damage the GCL where wrapped around the roll and generally do not provide sufficient uniform support to prevent roll bending or deformation, great care must be exercised when this option is used.

LGC.3.5 Inspection upon delivery

Each roll shall be visually inspected when unloaded to determine if any packaging or material has been damaged during transit. Possible product conditions and actions are listed below.

Rolls exhibiting damage shall be marked and set aside for closer examination during deployment.

•Minor rips or tears in the plastic packaging shall be repaired with moisture resistant tape before being placed in storage to prevent moisture damage.

The presence of free-flowing water within any roll packaging shall require that roll to be set aside for further examination to ascertain the extent of any damage.

GCL rolls delivered to the project site shall be only those indicated on GCL manufacturing quality control certificates.

Repairs to damaged GCL rolls shall be performed in accordance with LGC.5.5 of this specification.

LGC.3.6 Storage on Site

Storage of the GCL rolls shall be the responsibility of the Contractor or other designated party. All GCL rolls shall be stockpiled and maintained dry in a well-drained flat location area away from high-traffic areas but sufficiently close to the active work area to minimise handling.

Rolls shall not be stacked on uneven or discontinuous surfaces, in order to prevent bending, deformation, and damage to the GCL or cause difficulty inserting the carpet spike or core pipe.

GCL shall not be stored more than four rolls high, or limited to the height at which installation personnel may safety manoeuvre the handling apparatus. Stacks or tiers of rolls must be situated in a manner that prevents sliding or rolling by choking the bottom layer of the rolls.

An additional tarpaulin or plastic sheet shall be used over the stacked rolls to provide extra protection for GCL material stored outdoors.

Bagged bentonite material shall be stored under cover. Bags shall be stored on pallets or other suitably dry surfaces that will prevent prehydration.

LGC.4 PLANT

The appropriate specialist plant shall be provided to enable the installation of the Geosynthetic layer in accordance with this specification.

LGC.5. CONSTRUCTION & INSTALLATION

LGC.5.1 Subsurface preparation

The surfaces upon which the GCL is to be laid shall be suitable for the placement of GCL material, subject to the applicable section of this specification.

LGC.5.1.1 Subgrade

The surface upon which the GCL material has to be installed shall be inspected by the Engineer and CQA officer and the Contractor shall certify in writing that:

- a surveyor has established all lines and levels;
- the supporting soil meets the necessary specification;
- the surface to be lined has been finished so as to be free of irregularities, protrusions, loose soil, desiccation cracks and abrupt changes in level;
- the surface of the supporting soil does not contain stones or other objects which may be damaging to the GCL; and
- there are no areas excessively softened by high water content

The Contractor shall certify in writing that the surface on which the GCL has to be installed within the next 24 hours, is acceptable. The certificate of acceptance shall be given by the Contractor to the Engineer prior to commencement of GCL installation in the area under consideration.

LGC.5.1.2 Geosynthetic subgrade

Prior to GCL deployment the geosynthetic surface as well as other underlying geosynthetic membranes upon which the GCL material may be installed shall be inspected and approved by the Engineer or third party CQA officer in accordance with the requirements of the project specifications.

The earth of geosynthetic subgrade shall be continuously inspected, approved and certified by the Engineer or CQA officer prior to GCL placement. Subsequent to approval, it shall be the Contractor's responsibility to indicate to the Engineer any change in the subgrade condition that could cause it to be out of compliance with any of the requirements of this section or the project specification.

LGC.5.2 Anchor trench

An anchor trench shall be excavated by the Contractor to the lines and grades shown on the project drawings at the top of slopes.

The anchor trench shall be constructed free of sharp edges or corners and maintained in a dry condition. No loose soil shall be permitted beneath the GCL within the trench.

The anchor trench shall be inspected as well as approved by the Engineer or CQA officer before placement, backfilling and compaction of the anchor key material.

LGC.5.3 Placement

The GCL material shall be placed in accordance with the procedures specified below.

In the absence of specific guidelines, GCL panels shall be placed with the non-woven side up on slopes to maximise the shear strength characteristics.

In the base or flat areas, the GCL does not require any particular orientation, however, in composite liner applications, intimate contact may be facilitated by placing the woven face of the GCL against the overlying protection geomembrane.

Where possible, all slope panels shall be installed running down the slope, while panels installed in flat areas require no particular orientation.

Reinforced GCL shall be used on both slopes as well as the flat areas to ensure the GCL withstands the rigours of the installation and subsequent low load hydration.

Deployment shall proceed from the highest elevation to the lowest to facilitate drainage in case of precipitation.

The GCL may be deployed on slopes by pulling the material from a suspended roll, or securing a roll end into an anchor trench and unrolling each panel as the handling equipment slowly moves backwards. The roll must not be allowed to roll down the slope freely without any form of restraint.

Deployment on flat areas shall be conducted in the same manner as that for the slopes; however, care should be taken to minimise “dragging” the GCL. A slip-sheet (such as 0,5mm smooth plastic) may be used to facilitate positioning of the liner while ensuring the GCL is not damaged by underlying sources.

Overlaps shall be a 300mm (10% tolerance allowed) and shall be free of wrinkles, folds or “fish-mouths”.

Bentonite paste manufactured in accordance with the GCL supplier’s specification shall be placed between panels at a rate of 800 g/m of seam. Where a product is claimed to be self-sealing along the edges, the manufacturer shall provide proof of this claim.

The GCL shall be placed into and across the base of the excavated anchor trench, stopping at the back wall of the excavation. On gentle slopes or locations where it is difficult to create an anchor trench, the GCL may alternatively be anchored by a material run-out past the crest of the slope. The length of the run-out shall be pre-approved by the Engineer before the use of this method.

The Contractor shall only install as much GCL as can be covered at the end of the day. Only those GCL panels, which can be anchored and covered in the same day, shall be unpacked and installed. If exposed GCL cannot be permanently covered before the end of a working day, it shall be temporarily covered with plastic or other waterproof material to prevent hydration. No GCL shall be left exposed overnight. Exposed edges of the GCL shall be covered by a temporary water-resistant sheeting until work commences again.

Overlapping of sheets shall be reported by the Contractor to the Engineer by providing photographs with scale ruler every 10m of placement. The Engineer must be informed 2h in advance before a new sheet is being laid.

LGC.5.4 Detail work

Detail work, defined as the sealing of the liner to pipe penetrations, foundation walls, drainage structures, spillways, and other appurtenances, shall be performed as recommended by the GCL Manufacturer and approved by the Engineer

LGC.5.5 Damage repair

LGC.5.5.1 General

Before cover material placement, damage to the GCL shall be identified and repaired by the Contractor. Damage is defined as any rips or tears in the geotextiles, delamination of geotextiles, a displaced panel or too little overlapping.

LGC.5.5.2 Rip and Tear Repair (Flat Surfaces)

Rips or tear shall be repaired by completely exposing the affected area, removing all foreign objects or soil, and by then placing a patch cut from unusual GCL over the damage (damaged material may be left in place), with a minimum overlap of 300mm on all edges.

LGC.5.5.3 Rip and Tear Repair (Slopes)

Damaged GCL material on slopes shall be repaired by the same procedures as for flat surfaces, however, the edges of the patch shall also be adhered to the repaired liner with an adhesive to keep the patch in position during backfill or cover operations.

LGC.5.5.4 Displaced Panels

Displaced panels shall be adjusted to the correct position and orientation. The adjusted panel shall then be inspected for any geotextile damage or bentonite loss. Damage shall be repaired by the procedures described in LGC.5.5.2 and LGC 5.5.3.

LGC.5.5.5 Premature Hydration

If the GCL is prematurely hydrated, the Contractor shall notify the QA/QC technician and Engineer for a site-specific determination as to whether the material is acceptable or if alternative measures must be taken to ensure the quality of the design, dependant upon the degree of damage.

LGC.5.6 Cover Material

LGC.5.6.1 General

The cover materials shall be compatible as well as suitable for use over the GCL, and placed in a manner appropriate for the particular subgrade. Regardless of the cover material, the uncovered edge of GCL panels shall be protected at the end of the working day with a waterproof sheet, which is adequately secured with ballast.

LGC.5.6.2 Earth Cover Soil

If the cover material is soil, sand or gravel, a minimum thickness of 300mm shall be placed over the GCL. The soil cover shall be free of sharp-edged stones greater than 50mm in size. Laboratory analysis of especially calcareous cover material shall be required to ensure compatibility with the GCL.

Soil cover shall be placed with low ground pressure equipment. Care shall be taken to avoid damaging the GCL by making sharp turns or pivots with equipment as well as sudden starts or stops.

Soils may be placed over the GCL by pushing with a track dozer or by carefully placing it with a loader or a backhoe. The use of construction machinery directly over the GCL is strictly prohibited. A minimum thickness of 300mm of cover shall be kept between heavy equipment over the GCL until the proper thickness of cover has been placed.

To prevent damage to the GCL, the initial lift(s) of soil cover shall not be compacted more than 85 percent of modified AASHTO density or as specified by the Engineer.

LGC.5.6.3 Geosynthetic Cover

Precautions shall be taken to prevent damage to the GCL by restricting the use of heavy equipment over the liner system. Installation of the overlying geosynthetic component can be accomplished using lightweight, rubber-tyred equipment such as a 4-wheel all-terrain vehicle (ATV). This vehicle can be driven directly on the GCL, provided the ATV makes no sudden stops, starts or turns. Sand must be placed on the GCL using end tip procedures.

Smooth HDPE may be dragged across the GCL surface with equipment or by hand labour during positioning. Similarly, the HDPE may be unrolled with the use of low ground pressure equipment.

Textured HDPE shall be placed so as not to damage the GCL and subject to the approval of the Engineer.

LGC.6 TOLERANCES

Tolerances are covered under Section 7 Testing.

LGC.7 TESTING AND QUALITY CONTROL

LGC.7.1 Pre Delivery

LGC.7.1.1 Testing

The GCL material shall be tested for compliance with the specifications listed above (nominally as in Table LGC 3.1) by the test methods and frequencies indicated. During production, needle-punched GCL's shall be continuously inspected for broken needles using an in-line metal detector and broken needles shall be removed.

Conformance testing is not an opportunity to reproduce the QC testing program. It is a check to provide confirmation that satisfactory material is delivered to the site.

As with the HDPE testing, Conformance Testing shall be carried out by an independent laboratory (QCA laboratory). The testing frequency shall be at the discretion of the Engineer but the frequency shown in Table LGC.3.1 can be used as a guideline. The name and address of the laboratory will be supplied by the Engineer.

LGC.7.1.2 Submissions

The GCL manufacturer shall issue Quality Control submissions to the Engineer and CQA personnel for each delivery of material. The submissions shall include the following information:

Bentonite Manufacturer Certificate - Bentonite manufacturer quality documentation for the particular lot of clay used in the production of the rolls delivered.

Geotextile Manufacturer Certification - Geotextile manufacturer quality control documentation for the particular lots of geotextiles used in the production of the rolls delivered.

GLC Manufacturer Tracking List - Cross-referencing list delineating of the corresponding geotextile and Bentonite lots for the materials used in the production of the rolls delivered.

Manufacturing Quality Control Data - The manufacturing quality control test data indicating the actual test values.

Physical Properties Sheet - The material specification for the GCL supplied in accordance with this specification.

Letter of Certification - The letter indicating that the material is in conformance with the physical properties specified.

LGC.7.2 Pre-Installation

LGC.7.2.1 Manufacturing Quality Assurance Documentation

GCL Manufacturing Quality Assurance (MQA) sampling and testing for compliance with this specification shall be co-ordinated by the Engineer or third party Construction Quality Assurance (CQA) officer as necessary to support the Manufacturer's manufacturing Quality Control (MQC) data.

LGC.7.2.2 Information required before Installation

The following information shall be supplied to the Engineer by the Contractor for review within 10 business days of the Contract Award to ensure that the materials and parties selected for use on the project meet the requirements of this specification:

•Samples of GCL proposed for use on the project.

•Reference list supplied by GCL Manufacturer and Installer indicating the approximate experience level as required by the specification.

The following information shall be submitted by the Contractor to the Engineer before the deployment of any GCL material to ensure that the materials and subgrade preparation meet the requirements of this specification:

•GCL Manufacturer's Quality Control Certificates.

•Certifications of subgrade acceptance for each area covered by GCL, signed by the Contractor and the Engineer or his representative.

LGC.7.3 CQA Plan

LGC.7.3.1 General

An effective CQA plan depends largely on recognition of all construction activities that must be monitored, and on assigning responsibilities for the monitoring of each activity. This is most effectively accomplished and verified by the documentation of quality assurance activities.

If an overall contract CQA Plan exists, this shall apply.

LGC.7.3.2 Daily Record keeping

Standard reporting procedures shall include preparation of daily reports which, at a minimum, will consist of:

a)field notes, including memoranda of meetings and/or discussions with the Contractor;

b)observation logs, and testing data sheets; and

c)construction problem and solution data sheets. This information must be regularly submitted to, and reviewed by the Engineer.

LGC.7.3.3 Observation Logs and Testing Data Sheets

Observation logs and testing data sheets shall be prepared daily. At a minimum, these logs and data sheets shall include the following information:

- an identifying log/sheet number for cross-referencing and document control;
- date, client name, project name, location, and other identification;
- data on weather conditions;
- a site plan showing all active work areas and test locations;
- descriptions and locations of on-going construction;
- equipment and personnel in each work area, including those of all GCL and geomembrane related subcontractors;
- descriptions and specific locations of areas, or units, of work being tested and/or observed and documented;
- locations where tests were done and samples were taken;
- a summary of test results;
- calibration of test equipment, and actions taken as a result of any non-conformance;
- off-site materials received, including quality verification documentation;
- decisions made regarding acceptance of units of work and/or corrective actions to be taken;
- signatures of the Contractor and Engineer, or their representatives.

These logs must show all non-complying test results (trial seams, field destructive tests, air pressure tests, etc).

A comprehensive set of CQA Logs shall be as follows:

- Manufacturer/ Compliance Agreement
- Daily personnel attendance list
- Material inventory
- Conformance testing
- Subgrade acceptance
- Material deployment
- Repairs
- Laboratory test results
- Problems and solutions
- Soil cover placement
- Daily report

These documents shall provide full traceability of men, seaming machines, machine settings, materials, weather, and test results, in the event of in-service operational problems.

The Engineer or CQA Officer can incorporate all of these logs in the CQA Final Report.

LGC.7.4 CQA Final Report

LGC.7.4.1 Submission of Report

The CQA Final Report, should be submitted by the Engineer to the Employer within 40 days of completion of installation of the lining system, or some agreed time.

LGC.7.4.2 CQA Final Report Contents

At a minimum the CQA Final Report shall contain the following information:

An outline of the project

- A description of the lining/system
- Reference to the CQA Plan and other documents used
- GCL, geomembrane and other geosynthetic materials specifications
- A summary of on-site CQA activities and quantities (samples, failing results)
- A photographic record of construction
- Manufacturer/Contractor Compliance Agreement
- GCL QC certificates
- Subgrade acceptance certificates
- Copies of all logs
- All test results
- Discussion of problems and solutions
- Record drawings
- Certification statement

LGC.7.4.3 Record Drawings

The record drawings must show:

- The locations of all GCL seams and the types of seams
- GCL panel and roll numbers and GCL type
- The locations of all GCL repairs and the types of repairs
- Toes of slopes
- Crests of slopes
- Locations and numbers of GCL destructive test sample sites.
- Construction details that differ from as-designed details

LGC.8 MEASUREMENT AND PAYMENT

LGM.8.1 Geosynthetic Clay Liner supply

Unit: m^2.

Supply Geosynthetic Clay Liner (GCL) to GRI GCL 3 Rev 5, specifically Table 1 (a) as approved. Supply to the site, store the material on and off site in compliance with the specifications and the manufacturer's stipulations, test or comply with all Quality Assurance and Control requirements, in full accordance with the relevant specifications, irrespective of the source or point of manufacture.

Measurement is from the slope areas measured net, excluding all wastage and overlap requirements but including anchorage length and overlap with existing liner.

The costs of Freight, Duty, Landing charges and Rates of exchange shall be included in the Tendered Rate as well as all allowances for waste and overlap.

LGC.8.2 Install Geosynthetic Clay Liner

unit m^2.

The Tendered Rate shall include for all materials, plant, labour and other incidentals required to fully install the GCL in accordance with the relevant specifications. No additional payment will be made for any site transport, handling, cutting, waste, placing, joining, overlapping, temporary anchoring/securing, testing or compliance with all Quality Assurance and Control requirements, and Construction Quality Assurance Plans.

The area of GCL paid for shall be the **surveyed slope area** as **agreed (with the Engineer)** and shall include the length in the designed areas in the anchor trench and overlaps with existing lining systems but **exclude** the area taken up by wastage (cutting, general wastage, placing, joining, overlapping, temporary anchoring/securing of material in position, testing or control or assurance of quality). The exclusions are to be allowed for in the rate tendered.

The Tendered Rate shall also include for all materials, plant labour and other incidentals

10% of the rate tendered shall be withheld until all the documentation required in the contract for the GCL placement to the satisfaction of the Engineer has been delivered to him.

C3.4.5 LINING SYSTEMS - GEOMEMBRANE LINER

LGM : PARTICULAR SPECIFICATION: LINING SYSTEMS – GEOMEMBRANE LINER

LGM.1.1 Scope

This particular specification covers the supply and full installation of geomembrane lining. General specifications applicable shall be SANS 1526:2015 and the latest editions (**currently Rev 16**) of the GRI GM 13 and GM 19 specifications and that installation is in accordance with SANS 10409: 2020.

LGM 2 DEFINITIONS

Definitions in addition to those in the supporting specifications are:

Normal temperature: A temperature between 15°C and 32°C

Wrinkle, wave or fold: Undulation in the liner that is caused by installation methods, temperature fluctuations or activities such as cover placement on the liner.

Lining Contractor: The Contractor/Sub-Contractor (as applicable) who may be appointed by the Contractor to supply and install the geomembrane liner/s required for the project.

LGM 3 MATERIALS

The specific material requirements are:

The geomembrane liner shall be:

a) Thickness: minimum average shall be ≥2 mm, and the lowest individual value for any of the 10 values is to be -10% as per ASTM D5994.

LGM 3.1 Composition and requirements of geomembrane over and above SANS 1526 and GRI-GM13 Rev 14 Table 2(b).

The material shall:

a) be manufactured from a hexene or octene based resin for the HDPE

c) contain not more than 10% by mass of in-line reworked resin of the same type as the parent material.

d) be of only one type of resin and that shall be used in the manufacture of the geomembrane for this project and this shall be approved by the Engineer.

e) have texturing as specified shall be embossed on both faces and have a minimum asperity height of >0.65mm.

f) not be accepted if spray on texturing is used.

g) be welded with welding rods that shall be of the same base polymer and additives as the lining material.

In addition to the SANS 1526 specification, the material shall additionally be tested and comply with the following table:

Break elongation for textured liner – ASTM D6693 Type IV	minimum 250%
Puncture resistance - ASTM D4833	minimum 500N
Rapid tensile strain test to be undertaken at a strain rate of 300 mm/minute to determine if the material exhibits any separation in plane behaviour	
Melt Index (ASTM D1238 (190/2.16)); less than	1,0g/10min

Any testing required by the Engineer shall be undertaken timeously.

LGM 3.2 If a Tenderer wishes to submit any other product with different texturing surface and asperity heights, full material specifications and shear box test results using site appropriate materials must be submitted with the tender.

LGM 3.3 **Testing: Alternative materials offered must be shown to meet or exceed the requirements of the project specifications as well as the latest revisions of SANS 1526 and GRI-GM13. The cost and time of this approval and review process to be borne by the contractor.**

Tenderers should also note that the geomembrane liners selected should be resistant to degradation by sunlight, ultra-violet rays, ozone, airborne pollution, weathering and municipal leachate.

It is expected that the leachate will contain a range of contaminants, including simple organic acids and alcohols, ammonia, humic and fulvic acids as well as inorganic salts high in sodium, calcium, chloride, sulphate and iron.

LGM 3.3 **Installation**

Installation shall be in accordance with SANS 10409:2020.

LGM.8 MEASUREMENT AND PAYMENT

LGM.8.1 Geomembrane Liner supply

Unit: m^2.

Supply Geomembrane to GRI GM-13, 1.5mm thick HDPE as approved. Supply to the site, all handling and store safely, for slope areas measured net, excluding all wastage, overlaps and welding requirements but including anchorage length and overlap with existing liner.

Including for embossed texturing as approved on both faces of the geomembrane.

LGM.8.2 Geomembrane Liner installation

Unit: m^2.

The different types of geomembrane liner specified will be identified separately.

The area of geomembrane measured for payment shall be the **agreed (with the Engineer) surveyed slope area** and shall include the length in the designed areas in the anchor trench and overlaps with existing lining systems but **exclude** the area taken up by wastage (cutting, general wastage, placing, joining, overlapping, temporary anchoring/securing of material in position, testing or control or assurance of quality). The exclusions are to be allowed for in the rate tendered.

The rate tendered shall include for placement so as to minimise folds or wrinkles. Any fold of greater than **75mm in height over more than 250mm**, measured at the coolest time of day, shall be removed by a means allowed by the Engineer without additional payment being made. No folds or waves will be allowed along or across extrusion or wedge welds.

The unit rate shall include for all plant, labour and materials associated with the supplying and transporting to site, installation on site, and as specified, of the specified and approved material in position and allowing for waste, seaming requirements and meeting all of the manufacturer's requirements as appropriate.

Testing and compliance with all Quality Assurance and Control requirements, in full accordance with all relevant specifications irrespective of the source or point of manufacture is to be included in the unit rate... No additional payment will be made for any cutting, waste, placing, joining, overlapping, anchoring/securing of material in position, testing or control or assurance of quality.

The tendered rate for supply shall include for offloading of the geomembrane liner at the site. The contractor is to ensure that the geomembrane liner is stored at the site under protection and to the engineer's satisfaction.

Testing and test frequency as per GRI GM 13 Rev 11 shall be allowed for in the rate tendered.

10% of the rate tendered shall be withheld until all the quality control documentation required in the contract specifications and SANS 10409 for the geomembrane installation, is to the satisfaction of the Engineer, has been delivered to him.

LGM.8.3 Pipe penetrations through the lining system

Unit: m^2.

The rate shall include for all aspects (materials, installation, wastage, trimming etc) of providing a seal to any pipe penetration of the geomembrane or GCL liner, that is leakage proof and resistant to corrosion by

LGM.8.5 Establishment of non-destructive electrical leak detection equipment

Unit: sum

The rate tendered shall include for all operations associated with establishing and maintaining all leak detection / location systems on site for the duration of the testing, which shall be determined by the Contractor. Payment will be a single sum for all establishment of any and all testing equipment.

LGM.8.6 Non-destructive electrical leak detection by dipole Unit: m^2.

The rate tendered shall include for all operations associated with leak detection of the installed and geomembrane lining by dipole in accordance with ASTM D7007. The testing is to be done once the geomembrane is covered by the protection layer and this shall be moistened as needed and the cost included in the rate tendered.

The lined area to be tested will need to be electrically isolated from the surrounding ground, generally by a perimeter trench with the geomembrane exposed. The trench and any geomembrane needed for the operation will be paid under the relevant items. The rate tendered for the testing shall include for an adequate number of sensitivity tests using either a real or an artificial leak to be set up and performed before beginning the survey and to the approval of the Engineer.

C3.5: CONTRACT AND STANDARD DRAWINGS

C3.5.1 CONTRACT DRAWINGS / DETAILS

WS 7638 - 01 OVERALL PLAN SHOWING CELL 6 & ANCILLARY WORKS

WS 7638 - 02 PLAN & DETAILS CELL 6 EARTHWORKS & DRAINAGE

WS 7638 - 03 PLAN & DETAILS - NEW LEACHATE POND 3 EARTHWORKS & DRAINAGE

WS 7638 - 04 CELL 6 - LINING PLAN & DETAILS

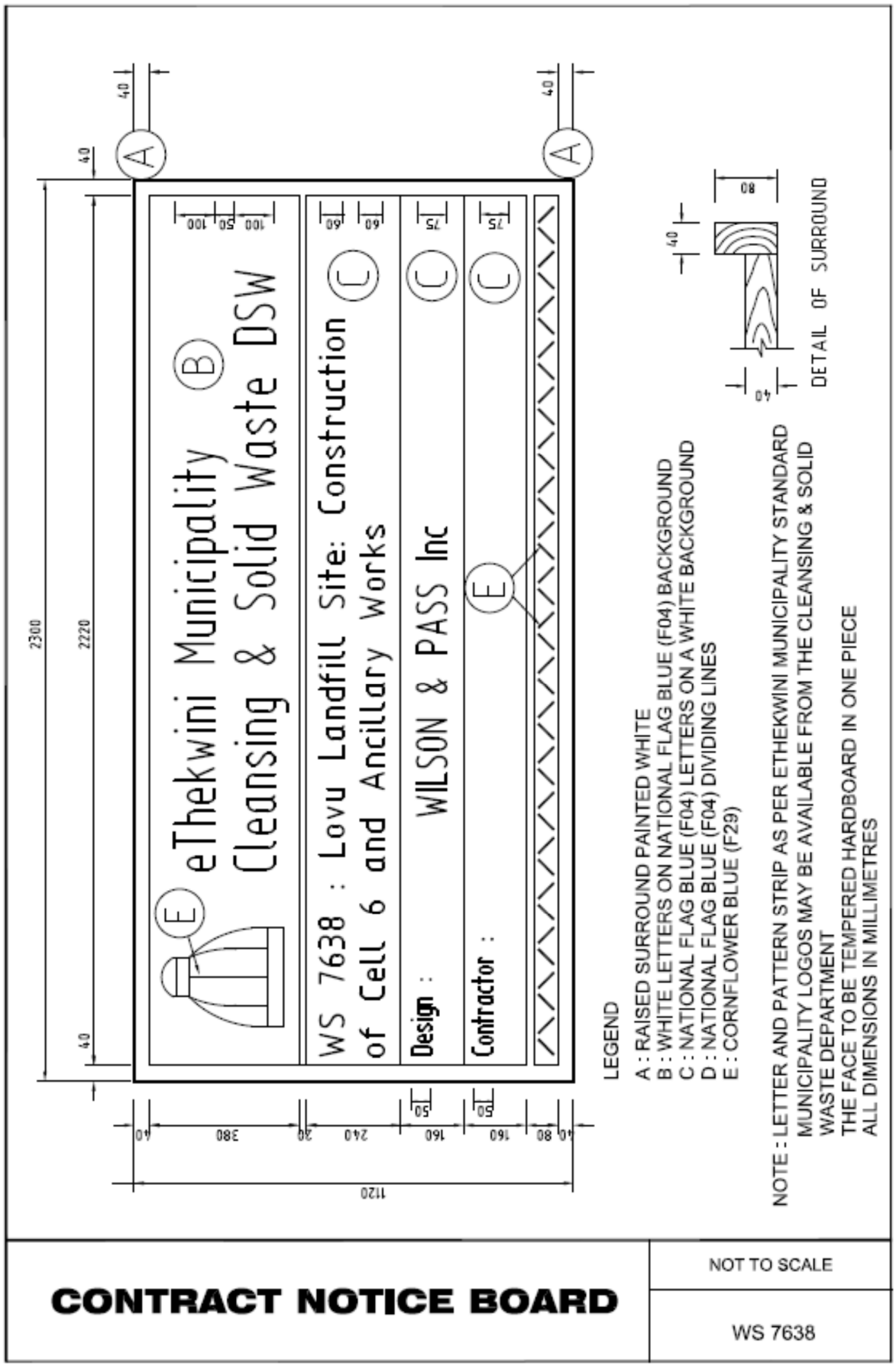
WS 7638 - 05 NEW LEACHATE POND 3 : LINING PLAN & DETAILS

WS7638 - 06 NEW LEACHATE POND 3: DETAILED PLAN

WS 7638 - 07 CELL 6 & LEACHATE POND 3 : CONSTRUCTION DETAILS

WS 7638 - 08 CELL 6 & LEACHATE POND 3 : CONCRETE DETAILS

WS 7638 - 09 CELL 6 & LEACHATE POND 3 : PLAN AND DETAILS : CAPPING


eThekwini Municipality
Cleansing & Solid Waste DSW
WS 7638 : Lovu Landfill Site: Construction of Cell 6 and Ancillary Works
Design : WILSON & PASS Inc
Contractor :
LEGEND
A : RAISED SURROUND PAINTED WHITE
B : WHITE LETTERS ON NATIONAL FLAG BLUE (F04) BACKGROUND
C : NATIONAL FLAG BLUE (F04) LETTERS ON A WHITE BACKGROUND
D : NATIONAL FLAG BLUE (F04) DIVIDING LINES
E : CORNFLOWER BLUE (F29)
NOTE : LETTER AND PATTERN STRIP AS PER ETHEKWINI MUNICIPALITY STANDARD
MUNICIPALITY LOGOS MAY BE AVAILABLE FROM THE CLEANSING & SOLID WASTE DEPARTMENT
THE FACE TO BE TEMPERED HARDBOARD IN ONE PIECE
ALL DIMENSIONS IN MILLIMETRES
DETAIL OF SURROUND
CONTRACT NOTICE BOARD
NOT TO SCALE
WS 7638

C3.5.2 STANDARD DRAWINGS

The Standard Drawings to which these Standard Engineering Specifications refer are listed below.

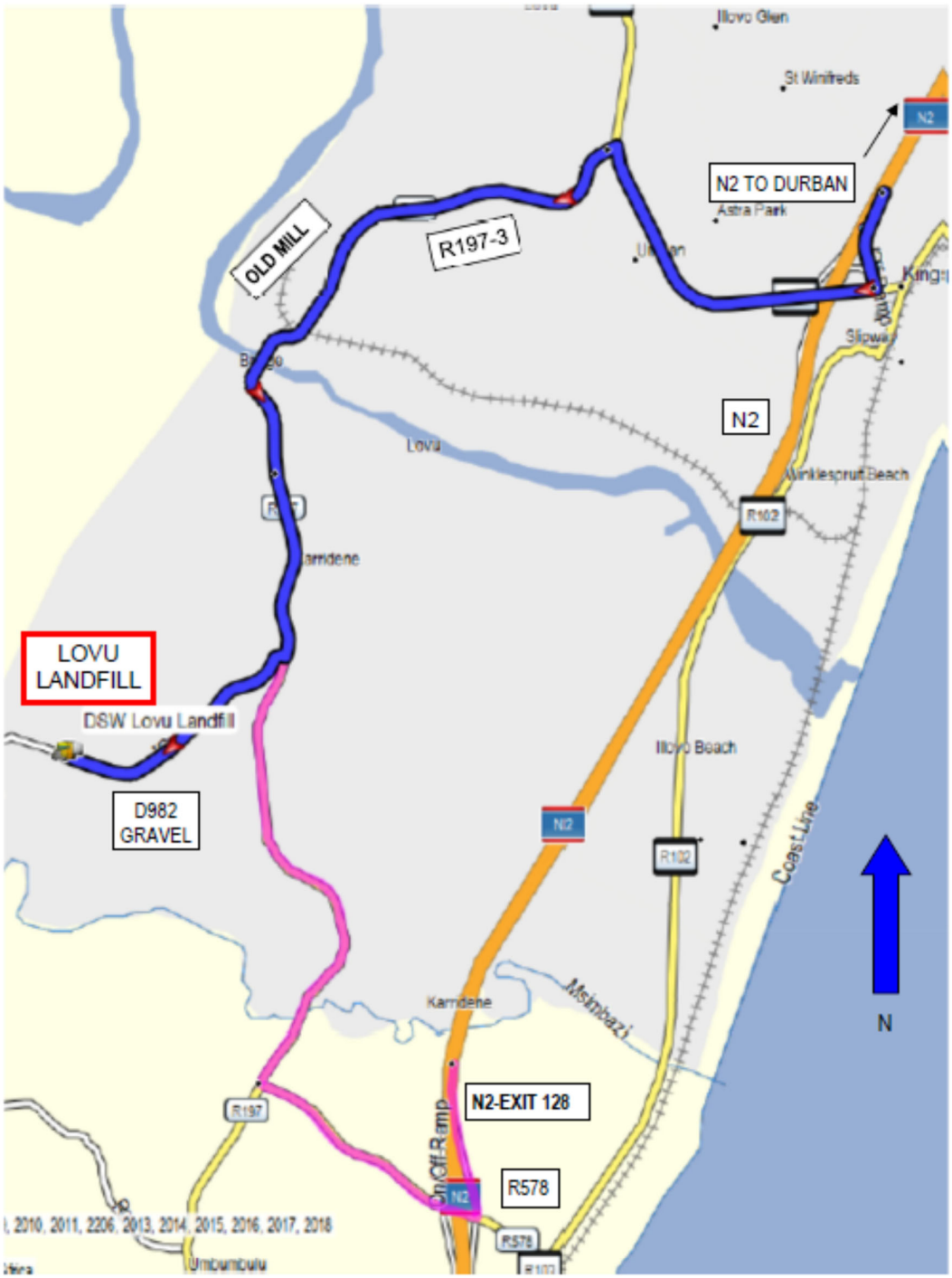
Dwg No.	Description	Date of Issue
38570	Ring Manholes	February 1990
38571	Brick Manhole Details	February 1990
38572	Stormwater Inlet Details	February 1990
38573	Stormwater Inlet Special Details	February 1990
38574	Sewer Manholes: Ramp, Backdrop and Channelling Details	February 1990
38575	Sub-Soil Drain, Pipe Bedding and Pipe Protection Details	February 1990
38576	Headwall Details	February 1990
38577	Kerbing Details	February 1990
38578	Concrete Median Barriers	February 1990
38579	Vehicular and Pedestrian Scoops	February 1990
38580	Concrete Bollard and Steel Guard Rail	February 1990
38581	Retaining Wall, PC Steps, Staircase, Cable Ducts and Headwalls	February 1990
38582	Precast Concrete Fencing and Aluminium Gates	February 1990
38583	Wire Mesh Fence and Gate Details	February 1990
38584	Standard Hydrant Thrust Blocks and Trenches	February 1990
38585	Water Connections, Pipework and Fittings	February 1990
38586	DP & TC Manholes - Rectangular	February 1990
38587	DP & TC Manholes - “L” Shaped	February 1990
38588	DP & TC Manholes - “T” Shaped	February 1990
38589	DP & TC Cable Ducts and Junction Box Details	February 1990
43120	Typical Details of Grid Inlets	February 1990

C3.6: ANNEXURES

C3.6.1 There are no Annexures

PART C4: SITE INFORMATION

C4.1 LOCALITY PLAN



LOVU LANDFILL – LOCALITY PLAN

Co ordinates are approximately: S 30 ° 6' 54" or 30,115° and E 30 ° 48' 44" or 30,812°

The site does appear on Google Maps as "Illovo DSW" (https://www.google.co.za/maps/@-30.1206679,30.8233712,15z?hl=en).

LOCALITY PLAN

Contract WS 7638 **LOVU LANDFILL: CELL 6 & ANCILLARY WORKS**

C4.2 CONDITIONS ON SITE

Test pit profiles. Test pits 3, 4, 5, 7, 9 and10 are relevant

LOVU LANDFILL PROPOSED CELL 6 - TEST PITS FROM NOVEMBER 2022

Machine: Caterpillar 3230 2 L Date: 16 Nov 22

TH No.	Depth	Thk	Origin	Description	Water	Collapse	Refusal	Test Depth	Sand & Gravel (%)	Silt (%)	Clay (%)	GM	PI
3	0.0 0.2	0.2	Transported	Very slightly moist, dark grey brown, gravelly, loose, clayey silt. Transported soil. With sugar cane roots.									
	1.2	1.0	Residual soil	Slightly moist, yellow & olive brown, firm, shattered and gravelly clayey silt with some shale fragments.									
		1.0	Residual bedrock	Slightly moist, grey, joints streaked yellow brown, closely bedded, medium jointed, extremely soft rock Pietermaritzburg Formation Shale. Approximate dip 10° SE				2.2m+	63	22	15	0.78	3.6
	2.2			**PRACTICAL REFUSAL**	N	N	Y						

LOVU LANDFILL PROPOSED CELL 6 - TEST PITS FROM NOVEMBER 2022

Machine: Caterpillar 3230 2 L Date: 16 Nov 22

TH No.	Depth	Thk	Origin	Description	Water	Collapse	Refusal	Test Depth	Sand & Gravel (%)	Silt (%)	Clay (%)	GM	PI
4	0.0												
	0.2	0.2	Transported	Very slightly moist, dark grey brown, gravelly, loose, clayey silt. Transported soil. With sugar cane roots.									
	0.9	0.7	Residual soil	Very slightly moist, yellow & olive brown, very stiff, shattered and broken completely weathered Pietermaritzburg Formation Shale (gravelly & clayey silt).									
		0.5	Residual bedrock	Slightly moist, grey, joints streaked yellow brown, closely bedded, medium jointed, extremely to very soft rock Pietermaritzburg Formation Shale. Approximate dip sub horizontal.				1.4m+	63	22	15	0.78	3.6
	1.4			**PRACTICAL REFUSAL**	N	N	Y						

LOVU LANDFILL PROPOSED CELL 6 - TEST PITS FROM NOVEMBER 2022

Machine: Caterpillar 3230 2 L **Date:** 16 Nov 22

TH No.	Depth	Thk	Origin	Description	Water	Collapse	Refusal	Test Depth	Sand & Gravel (%)	Silt (%)	Clay (%)	GM	PI
5	**0.0**												
		1.1	Transported	Slightly moist, very dark grey brown, soft, clayey silt. Transported soil. With sugar cane roots in upper part of layer.									
	1.1												
		2.2	Residual soil	Slightly moist, yellow brown & orange, firm gravelly with depth & silty clay. Residual Pietermaritzburg Formation Shale.				**1.2 - 3.3**	**21**	**51**	**28**	**0.25**	**19**
	3.3												
		1.2	Residual soil	Slightly moist, yellow & olive brown, extremely soft rock completely weathered Pietermaritzburg Formation Shale (gravelly & clayey silt). Dip not able to be discerned.									
	4.5			**PRACTICAL LIMIT OF MACHINE**	**N**	**N**	**N**						

LOVU LANDFILL PROPOSED CELL 6 - TEST PITS FROM NOVEMBER 2022

Machine: Caterpillar 3230 2 L **Date:** 16 Nov 22

TH No.	Depth	Thk	Origin	Description	Water	Collapse	Refusal	Test Depth	Sand & Gravel (%)	Silt (%)	Clay (%)	GM	PI
7	0.0												
	1.2	1.2	Transported	Moist, dark grey, soft, clayey silt with occasional shale rock fragments. Transported soil. With sugar cane roots in upper part of layer.									
	2.4	1.2	Residual soil	Moist, yellow & brown streaked, firm gravelly with depth & silty clay. Residual Pietermaritzburg Formation Shale. Shattered with some shale fragments.				1.2 - 2.4	24	51	25	0.39	20
	3.8	1.4	Residual soil	Moist, yellow to orange brown, extremely soft rock completely weathered Pietermaritzburg Formation Shale (gravelly & clayey silt). Dip not able to be discerned.									
	3.8			**SLOW EXCAVATION**	N	N	N						

LOVU LANDFILL PROPOSED CELL 6 - TEST PITS FROM NOVEMBER 2022

Machine: Caterpillar 3230 2 L Date: 16 Nov 22

TH No.	Depth	Thk	Origin	Description	Water	Collapse	Refusal	Test Depth	Sand & Gravel (%)	Silt (%)	Clay (%)	GM	PI
9	0.0												
	0.3	0.3	Transported	Slightly moist, dark grey brown, stiff, clayey silt. Shattered & with occasional shale rock fragments. Transported soil. With sugar cane roots in upper part of layer.									
	1.0	0.7	Transported	Slightly moist, olive yellow & grey, stiff gravelly with depth & clayey silt. Transported soil. Shattered with some shale fragments.				1.6- 2.7	15	57	28	0.18	20
	1.6	0.6	Transported	Slightly moist, dark grey, orange & yellow brown stiff, gravelly & clayey silt. Transported soil. Shattered with some shale fragments.									
	2.7	1.1	Residual soil	Slightly moist, dark grey brown & orange, stiff to extremely soft rock completely weathered Pietermaritzburg Formation Shale (gravelly & clayey silt). Dip not able to be discerned.									
	4.3	1.6	Residual soil	Slightly moist, grey brown & yellow, stiff to extremely soft rock completely weathered Pietermaritzburg Formation Shale (gravelly & clayey silt). Shattered, dip not able to be discerned.									
	4.3			**SLOW EXCAVATION**	**N**	**N**	**N**						

LOVU LANDFILL PROPOSED CELL 6 - TEST PITS FROM NOVEMBER 2022

Machine: Caterpillar 3230 2 L **Date:** 16 Nov 22

TH No.	Depth	Thk	Origin	Description	Water	Collapse	Refusal	Test Depth	Sand & Gravel (%)	Silt (%)	Clay (%)	GM	PI
10	**0.0**												
	0.3	0.3	Transported	Very moist, dark grey brown, soft, clayey silt. with occasional shale rock fragments & roots in upper part of layer. Transported soil. Some surface water.									
	1.0	0.7	Transported	Moist, dark grey brown, soft, clayey silt. with occasional shale rock fragments in upper part of layer. Transported soil. Some surface water.				**1.0 - 3.0**	**24**	**49**	**27**	**0.26**	**18**
	3.0	2.0	Transported	Moist, orange brown, firm to stiff, shattered, gravelly & clayey silt with some shale fragments. Residual soil. Pietermaritzburg Formation Shale.									
	3.8	0.8	Residual soil	Moist, dark grey brown, orange & yellow, stiff, shattered, residual soil, completely weathered Pietermaritzburg Formation Shale (gravelly & clayey silt with shale fragments). Dip not able to be discerned; possible slip debris..Seepage from ±3.6m.	**3.6**								
	3.8			**SLOW EXCAVATION**		**N**	**N**						

C4.3 TEST RESULTS

There are no specific test results.