

TENDER NO. T 2023/022



CONTRACT DOCUMENT

FOR THE

CONSTRUCTION FOR CLASS B LANDFILL AT WORCESTER, CWDM

APPROVED AND ISSUED BY:

COMPILED BY:

**THE MUNICIPAL MANAGER
CAPE WINELANDS DISTRICT MUNICIPALITY
P.O. BOX 100
STELLENBOSCH
7599**



MAY 2023

TENDERER:

TENDER AMOUNT:

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T2023/022

**CONSTRUCTION FOR CLASS B LANDFILL AT
WORCESTER, CWDM**

GENERAL TENDER INFORMATION

TENDER ADVERTISED	:	Friday, 30 June 2023
ESTIMATED CIDB CONTRACTOR GRADING	:	8CE or higher.
CLARIFICATION MEETING	:	11h00 on Wednesday, 12 July 2023
VENUE FOR SITE CLARIFICATION	:	Existing MRF next to the existing landfill site on the R43 outside Worcester
CLOSING DATE	:	11:00 on Wednesday 02 August 2023
CLOSING TIME	:	11h00
CLOSING VENUE	:	Tender Box at the Cape Winelands District Municipality Offices, Stellenbosch (29 Du Toit Street, Stellenbosch)
TENDER BOX	:	The tender Documents (which include the Form of Offer and Acceptance) completed in all respects, plus any additional supporting documentation required, must be submitted in a sealed envelope with the name and address of the tenderer, the tender No. and title, and the closing date indicated on the envelope. The sealed envelope must be inserted into the appropriate official tender box before closing time. If the tender offer is too large to fit into the abovementioned box or the box is full, please enquire at the public counter for alternative instructions. The onus remains with the tenderer to ensure that the tender is placed in either the original box or as alternatively instructed.

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

**CONSTRUCTION FOR CLASS B LANDFILL AT
WORCESTER, CWDM**

Contents	
Number	Heading
The Tender	
Part T1: Tendering procedures	
T1.1	Tender Notice and Invitation to Tender
T1.2	Tender Data
Part T2: Returnable documents	
T2.1	List of Returnable Documents
T2.2	Returnable Schedules
The Contract	
Part C1: Agreements and Contract Data	
C1.1	Form of Offer and Acceptance
C1.2	Contract Data
C1.3	Form of Guarantee
C1.4	Occupational Health and Safety Agreement
Part C2: Pricing data	
C2.1	Pricing Assumptions
C2.2	Bills of Quantities
Part C3: Scope of Work	
C3.1	Description of the Works
C3.2	Engineering
C3.3	Construction
C3.4	Management
Part C4 : Site Information	
C4	Site Information

Part T1: Tendering procedures

	Pages
T1.1 Tender Notice and Invitation to Tender.....	5
T1.2 Tender Data	6 – 27



CAPE WINELANDS DISTRICT

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T 2023/022
CONSTRUCTION OF CLASS B LANDFILL AT
WORCESTER, CWDM

Tenders are hereby invited from suitable qualified service providers for the construction of a Class B Landfill at Worcester. Tenderers should have a CIDB contractor grading of 8CE or higher.

A information session will be held on **Wednesday, 12 July 2023 at 11h00**. Prospective bidders shall meet the CWDM representative at the existing MRF next to the existing landfill site on the R43 outside Worcester.

Technical enquiries regarding the bid may be directed to Mr. Brendon Jewaskiewitz of Envitech South Africa (Pty) Ltd at telephone 031 023 0980 or brendon@envitech.co.za.

This tender will be evaluated in terms of the Preferential Procurement Regulations, 2022 that was promulgated by the Minister of Finance on 4 November 2022 in Government Gazette No 47452. Please take note of the responsiveness criteria as stipulated in the tender document.

PROCUREMENT PREFERENCE POINT SYSTEM: 90/10

Tender documents are obtainable from the Supply Chain Management Unit of the Cape Winelands District Municipality at 29 Du Toit Street, Stellenbosch - Tel no 0861 265 263, upon payment of a non-refundable fee of R 470.00 per document into the CWDM bank account. Bank details can be obtained from Elmine Niemand via e-mail: elmine@capewinelands.gov.za.

All prospective bidders must ensure that they are registered and accredited on the CWDM's Supplier Database and the Central Supplier Database, prior to the closing date of the tender.

Duly completed tenders must be enclosed in a (separate) sealed envelope and endorsed with the relevant tender number and description on the envelope/s. The sealed tenders must be placed in the official tender box of the District Municipality's offices at 29 Du Toit Street, Stellenbosch, before **11:00 on Wednesday 02 August 2023**.

Tenders will be opened in public as soon as possible after this closing time.

H F PRINS
MUNICIPAL MANAGER

CAPE WINELANDS DISTRICT MUNICIPALITY

TENDER T 2023/022
CONSTRUCTION OF CLASS B LANDFILL AT
WORCESTER, CWDM

T1.1.2 Invitation to Bid – MBD 1

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE CAPE WINELANDS DISTRICT MUNICIPALITY					
Tender number:	T2023/022	Closing date:	02/08/2023	Closing time:	11h00
Description	CONSTRUCTION OF CLASS B LANDFILL AT WORCESTER, CWDM				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD7).					
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE TENDER BOX SITUATED AT: 29 DU TOIT STREET, STELLENBOSCH					
SUPPLIER INFORMATION					
Name of bidder					
Postal address					
Street address					
Contact person					
Telephone number	Code		Number		
Cell phone number					
E-mail address					
VAT registration number					
COIDA certificate number					
Tax compliance status	TCS PIN:		OR	CSD No:	MAAA
<u>SPECIFIC GOALS IN TERMS OF THIS TENDER:</u>					
<ul style="list-style-type: none">50% of the 20/10 points will be allocated to promote the goal of B-BBEE status level of contributor and points will be allocated in terms of the B-BBEE scorecard50% of the 20/10 points will be allocated to promote the specific goal of locality and points will be allocated in terms of where the enterprise' head office or primary place of business or regional or satellite office is located					
B-BBEE status level verification certificate [tick applicable box]	<input type="checkbox"/> Yes <input type="checkbox"/> No		Proof of Locality [tick applicable box]		<input type="checkbox"/> Yes <input type="checkbox"/> No
B-BBEE status level sworn affidavit [tick applicable box]	<input type="checkbox"/> Yes <input type="checkbox"/> No				
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE / SWORN AFFIDAVIT (FOR EMES & QSEs) AND PROOF OF LOCALITY MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS]					

Are you the accredited representative in South Africa for the goods / services / works offered?	<input type="checkbox"/> Yes <input type="checkbox"/> No [If yes enclose proof]	Are you a foreign based supplier for the goods / services / works offered?	<input type="checkbox"/> Yes <input type="checkbox"/> No [If yes, answer part b:3]
Total number of items offered		Total bid price	R
Signature of bidder		Date	
Capacity under which this bid is signed			
TECHNICAL INFORMATION MAY BE DIRECTED TO:			
Contact person	Christo Swart		
Telephone number	023 348 2300		
E-mail address	christo@capewinelands.gov.za		
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED			
Contact person	Elmine Niemand		
Telephone number	021 888 5175		
E-mail address	elmine@capewinelands.gov.za		
TERMS AND CONDITIONS FOR BIDDING – PART B			
1. BID SUBMISSION:			
1.1. Bids must be delivered by the stipulated time to the correct address. Late bids will not be accepted for consideration. 1.2. All bids must be submitted on the official forms provided–(not to be re-typed) or online 1.3. This bid is subject to the Preferential Procurement Policy Framework Act and the Preferential Procurement Regulations, 2022, the General Conditions of Contract (GCC) and, if applicable, any other special conditions of contract.			
2. TAX COMPLIANCE REQUIREMENTS			
2.1 Bidders must ensure compliance with their tax obligations. 2.2 Bidders are required to submit their unique personal identification number (pin) issued by SARS to enable the organ of state to view the taxpayer's profile and tax status. 2.3 Application for the tax compliance status (TCS) certificate or pin may also be made via e-filing. In order to use this provision, taxpayers will need to register with SARS as e-filers through the website www.sars.gov.za . 2.4 Foreign suppliers must complete the pre-award questionnaire in part b:3. 2.5 Bidders may also submit a printed TCS certificate together with the bid. 2.6 In bids where consortia / joint ventures / sub-contractors are involved, each party must submit a separate TCS certificate / pin / CSD number. 2.7 Where no TCS is available but the bidder is registered on the central supplier database (CSD), a CSD number must be provided.			
3. QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS			
3.1. Is the entity a resident of the republic of South Africa (RSA)? <input type="checkbox"/> Yes <input type="checkbox"/> No 3.2. Does the entity have a branch in the RSA? <input type="checkbox"/> Yes <input type="checkbox"/> No 3.3. Does the entity have a permanent establishment in the RSA? <input type="checkbox"/> Yes <input type="checkbox"/> No 3.4. Does the entity have any source of income in the RSA? <input type="checkbox"/> Yes <input type="checkbox"/> No 3.5. Is the entity liable in the RSA for any form of taxation? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If the answer is “no” to all of the above, then it is not a requirement to register for a tax compliance status system pin code from the South African Revenue Service (SARS) and if not register as per 2.3 above. NB: failure to provide any of the above particulars may render the bid invalid. No bids will be considered from persons in the service of the state.			

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL AT WORCESTER, CWDM

T1.2 Tender Data

The Conditions of Tender as published by the Construction Industry Development Board (CIDB) in Annex C of Board Notice 423 of 2019 in Government Gazette No. 42622 of 8 August 2019, Construction Industry Development Board (CIDB) Standard for Uniformity in Construction Procurement (see www.cidb.org.za), as amended by the employer, shall apply to this contract.

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

The following variations, amendments and additions to the Standard Conditions of Tender as set out in the Tender Data below shall apply to this tender:

Clause number	Tender Data
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C.1	General
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C.1.1	Actions
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Add the following:

The Employer is the **CAPE WINELANDS DISTRICT MUNICIPALITY** represented by Mr Christo Swart.

C.1.2	Tender Documents
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Add the following:

"The following documents form part of this tender:

VOLUME 1 : The General Conditions of Contract for Construction Works (Third Edition) 2015 as published by the South African Institution of Civil Engineering. This publication is available, and tenderers must obtain copies at their own cost from the South African Institution of Civil Engineering (SAICE), Private Bag X200, Halfway House 1685, Tel: (011) 805 5947, Fax: (011) 805 5971, e-mail: civilinfo@saice.org.za.

VOLUME 2 : The SANS Standardised Specifications for Civil Engineering Construction prepared by Standards South Africa. These publications are available, and tenderers must obtain copies at their own cost from Standards South Africa, Private Bag X191, PRETORIA, 0001.

Volumes 1 and 2 may also be inspected, by appointment, at the offices of the Employer's agent during normal office hours.

The contract documents issued by the Employer comprise:

VOLUME 3: The Contract Document (this document), in which is bound:

The Tender

Part T1: Tendering procedures

T1.1 Tender notice and invitation to tender

T1.2 Tender data

Part T2: Returnable Documents

T2.1 List of returnable documents

T2.2 Returnable schedules

The Contract

Part C1: Agreements and Contract Data

- C1.1 Form of offer and acceptance
- C1.2 Contract data
- C1.3 Form of Guarantee
- C1.4 Occupational Health and Safety Agreement

Part C2: Pricing Data

- C2.1 Pricing Assumptions
- C2.2 Bills of Quantities

Part C3: Scope of Work

- C3.1 Description of the Works
- C3.2 Engineering
- C3.3 Construction
- C3.4 Management

Part C4 : Site information

- C4 Site information

Volume 3 is deemed the "Returnable Document" which must be returned to the Employer in terms of submitting a tender offer.

VOLUME 4: Book of Drawings

C.1.4 Communication and employer's agent *Add the following:*

Attention is drawn to the fact that verbal information, given by the Employer's agent during site visits/clarification meetings or at any other time prior to the award of the Contract, will not be regarded as binding on the Employer. Only information issued formally by the Employer in writing to tenderers will be regarded as amending the Tender Documents.

The Employer's agent is:

Name: **Envitech Solutions (Pty) Ltd**
Address: **22 Seventh Avenue (cnr Third Street)**
Northmead
Benoni
1501
Tel: **(031) 023 0980**
Email: brendon@envitech.co.za

C.1.6.2 Competitive negotiation procedure

Add the following to F.1.6.2

A competitive negotiation procedure will not be followed.

C.1.6.3 Proposal procedure using the two-stage system

Add the following to F.1.6.3

A two-stage system will not be followed.

C.2 Tenderer's obligations

C.2.1 Eligibility

Add the following to C.2.1.1:

C.2.1.1 Only those tenderers who satisfy the following criteria are eligible to submit tenders:

C2.1.1.1 Construction Industry Development Board (CIDB) Registration

Only those tenderers who are registered with the Construction Industry Development Board (CIDB) in an **8CE contractor designation or higher** and whose registrations are active at close of tenders when evaluation of tenders commences are eligible to submit tenders.

For alpha-numeric associated with the CIDB contractor grading designations, considered reasonable by the employer – refer to table G1 below.

Table G1: CIDB Contractor Grading Designations and Associated Parameters

CIDB Contractor Grading Designation	Maximum value (R) of contract that a contractor is considered capable of performing (CIDB Regulation 17)
1 (class of construction works)	500 000
2 (class of construction works)	1 000 000
3 (class of construction works)	3 000 000
4 (class of construction works)	6 000 000
5 (class of construction works)	10 000 000
6 (class of construction works)	20 000 000
7 (class of construction works)	60 000 000
8 (class of construction works)	200 000 000
9 (class of construction works)	No Limit

In the event that the sum tendered exceeds the maximum value margin shown then such tender shall be deemed unreasonable and non-responsive.

Joint ventures are eligible to submit tenders provided that:

- (i) Every member of the joint venture is registered with the CIDB, and their registrations are valid at close of tenders when evaluation of tenders commences.
- (ii) The lead partner is registered with CIDB in an **8CE** designation and grading equal to or higher than one grading lower than that commensurate with the sum tendered.
- (iii) The contract participation of each member in a joint venture may not exceed the tender value limit of one grade above that member's CIDB grading.

C.2.1.1.2 As a statutory requirement, the contractor must be registered with the Department of Employment and Labour for Compensation for Occupational Injury and Diseases Act (**COIDA**) or any other accredited Compensation Insurer. Proof of Registration and a valid Letter of Good Standing must be handed in with the tender in this regard.

C.2.7 Clarification meeting

Add the following:

The arrangements for an information meeting are as stated in the Tender Notice and Invitation to Tender.

Tenderers should be represented at the information meeting by a person who is suitably qualified and experienced. Attendance will assist in pricing the tender more accurately as important information will be presented at the meeting.

C.2.9 Insurance

Add the following:

The employer will not provide any insurance for goods prior to the transfer of ownership. The Contractor will be liable for insurance and Public Liability during the contract.

C.2.10 Pricing the tender offer

Add the following:

If any products or services will be rendered at no charge, in such an instance the price should be indicated on the pricing schedule as R0.00.

C.2.12 Alternative tender offers

Add the following to C.2.12.1:

C.2.12.1 No alternative offers will be considered.

C.2.13 Submitting a tender offer

Add the following to C.2.13.1

C.2.13.1 Where the tendering entity is a joint venture, the *standard CIDB Joint Venture Agreement* must be used.

Add the following to C.2.13.3

C.2.13.3 Parts of each tender offer communicated on paper shall be submitted as an original, plus 2 (two) copies.

Add the following after the first sentence of C.2.13.4:

C.2.13.4 The tender shall be signed by a person duly authorised to do so. Tenders submitted by joint ventures of two or more firms shall be accompanied by the document of formation of the joint venture, in which is defined precisely the conditions under which the joint venture will function, its period of duration, the persons authorised to represent and obligate it, the participation of the several firms forming the joint venture, and any other information necessary to permit a full appraisal of its functioning.

Add the following to C.2.13.5:

C.2.13.5 The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are:

Location of tender box: Cape Winelands District Municipality Offices

Physical address: Cape Winelands District Municipality, 29 Du Toit Street, Stellenbosch, 7599

Identification details: Tender number T 2023/022
Title of tender: **CONSTRUCTION OF A CLASS B LANDFILL AT WORCESTER, CWDM**

Sealed tenders with the Tenderer's name and address and the endorsement "**TENDER NO. T 2023/022: CONSTRUCTION OF A CLASS B LANDFILL AT WORCESTER, CWDM**" on the envelope, must be placed in the official tender box at the abovementioned address.

Add the following to C.2.13.6:

C.2.13.6 A two-envelope procedure will **not** be followed.

Add the following sub-clause after C.2.13.9:

C.2.13.10 By signing the offer part of C1.1 Form of Offer and Acceptance the tenderer declares that all information provided in the tender submission is true and correct.

C.2.15 Closing time

Add the following to C.2.15.1:

C.2.15.1 The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.
Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.

C.2.16 **Tender offer validity**

Add the following to C.2.16.1:

C.2.16.1 The tender offer validity period is **180 days**.

C.2.17 **Clarification of tender offer after submission**

Add the following to C.2.17:

A tender will be regarded as non-responsive if the tenderer fails to provide any clarification or supporting documentation requested by the Employer within the time for submission stated in the Employer's written request for such clarification or documentation. A tender will also be regarded as non-responsive if the tenderer fails, within the time stated in writing by the Employer, to comply with the requirements.

C.2.23 **Certificates**

Add the following:

The tenderer is required to submit the following:

1. A copy of a Tax Compliance Status Pin, printed from the South African Revenue Service (SARS) website, must accompany the bid documents. The onus is on the bidder to ensure that their tax matters are in order with SARS. In the case of a Consortium/Joint Venture every member must submit a separate Tax Compliance Status Pin, printed from the SARS website, with the bid documents.
If a bid is not supported by a Tax Compliance Status Pin as an attachment to the bid documents, the Municipality reserves the right to obtain such documents after the closing date to verify that the bidder's tax matters are in order. If no such document can be obtained within a period as specified by the Municipality, the bid will be disqualified. The Tax Compliance Status Pin will be verified by the Municipality on the SARS website.
2. A copy of the current municipal account obtainable from any Local Municipality or a Municipal Accounts Clearance Certificate.
3. An original valid B-BBEE status level verification certificate or an ORIGINAL CERTIFIED copy in terms of the Construction Sector Charter on Black Economic Empowerment and Proof of Locality, in terms of the Preferential Procurement (Failure to submit applicable documents will not lead to disqualification, but the tenderer will score 0 points for B-BBEE during the evaluation of tender offers).
4. As a tender requirement, Contractors in the Western Cape Province are obligated to be registered in the name of the entity with the **Bargaining Council for the Civil Engineering Industry (BCCEI)**. Proof of Registration and a valid Letter of Good Standing must be submitted within 14 days after award of tender in this regard.

Consortiums/Joint Ventures will qualify for preference points, provided that the entity submits the relevant certificate.

C.3 The Employer's undertakings

C.3.2 **Issue Addenda**

Add the following to C.3.2:

Notwithstanding any requests for confirmation of receipt of Addenda issued, the tenderer shall be deemed to have received such addenda if the employer can show proof of transmission thereof (or a notice in respect thereof) via electronic mail, facsimile or registered post.

C3.4 **Opening of tender submissions**

Add the following to C.3.4.1:

C.3.4.1 The time and location for opening of the tender offers is:

Time: Tenders will be opened immediately after the closing time for receipt of tenders as stated in the Tender Notice and Invitation to Tender, or as stated in any Addendum extending the closing date.

Location: Tender box at **Cape Winelands District Municipality Offices, 29 Du Toit Street, Stellenbosch**

C.3.11 **Evaluation of tender offers**

C.3.11.1 General

Add the following:

The procedure for the evaluation of responsive tenders is **Method 2: Functionality, Price and Preference** in accordance with C.3.11.3, with functionality (quality) being evaluated only as a pre-qualification, **but the points scored for Quality will not form part of the total tender evaluation points**. The responsive & eligible tenders will first be evaluated according to the Quality Criteria (functionality score) as stated in the tender data.

Apply the 90/10 Preference Point system where a maximum of ninety (90) tender adjudication points be awarded for price & ten (10) points will be awarded for preference in terms of the Preferential Procurement Policy Framework act (PPPFA) (Act 5 of 2000) and Preferential Procurement Regulations, 2022.

C.3.11.3 Method 2: Functionality, Price and Preference

Add the following description to this clause:

The tenders will first be evaluated according to the Quality Criteria (functionality score). This evaluation will serve only as an indicator of the Contractor's ability to perform the required works and will not affect the ranking or final outcome of the appointment.

All eligible tenders will then be evaluated on price offered and preference (BBBEE & Locality) and ranked accordingly where the 90/10 Preference Point System. (Standard Conditions of tender: **Method 2**)

Therefore, in the case of the functionality, price and preferences, the following steps will be followed:

- a) Pre-qualify each tender in respect of the quality offered (amended clause C.3.11.9 below), commenting on the Contractor's experience and ability to perform the works.
- b) Then score each tender in respect of the financial offer made (clause C.3.11.7) and preference claimed (C.3.11.8) if any.
- c) Calculate the total number of tender evaluation points (T_{EV}) in accordance with the following formula:

$$T_{EV} = N_{FO} + N_P$$

With

T_{EV}	=	Total number of Tender evaluation Points (100)
N_{FO}	=	Number of tender evaluation points awarded for financial offer made in accordance with C.3.11.7 below (90)
N_P	=	Number of tender evaluation points awarded for preferences claimed in accordance with C.3.11.8 below (10)

- d) Rank tender offers from the highest number of tender evaluation points to the lowest.
- e) Recommend the tender with the highest number of tender evaluation points for the award of the contract, unless there is a reason not to in accordance with section 2 of the Preferential Procurement Policy Framework Act, 2000 and Preferential Procurement Regulations, 2022.
- f) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points and recommend the tenderer with the rescored highest number of evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this sub clause is repeated.

C.3.11.7 Scoring Financial Offers

Add the following:

The financial offer will be scored using **Formula 2 (Option 1)** where the value of W_1 is 90 points.

C.3.11.8 Scoring Preferences

Add the following:

90/10 Preference point system [(for acquisition of goods or services for a Rand value above R50 million) (all applicable taxes included)]

The points are awarded as follows:

- 90 points is awarded for the **lowest price** if it complies with the Tender conditions.
- Additional points are awarded for the following specific goals:

- **B-BBEE status level of contributor** and “**Locality**”
- 50% of the 10 points will be allocated to promote the goal of B-BBEE status level of contributor and points will be allocated in terms of the B-BBEE scorecard as follows:

B-BBEE Status Level of Contributor	Number of Points for Preference (90/10)
1	50% of 10
2	50% of 9
3	50% of 8
4	50% of 5
5	50% of 4
6	50% of 3
7	50% of 2
8	50% of 1
Non-compliant contributor	0

- 50% of the 10 points will be allocated to promote the specific goal of locality. Points will be allocated as follows:

No.	Requirement	Number of Points
1	Procurement under the 90/10 preference points system where the enterprise head office or primary place of business or regional or satellite office is located within the boundaries of the Cape Winelands District Municipal Area	2.5
2	Procurement under the 90/10 preference points system where the enterprise head office or primary place of business or regional or satellite office is located within the boundaries of the Western Cape Province.	2.5

C.3.11.9

Scoring Quality

Replace entire clause C.3.11.9 with the following:

Quality (functionality) will be scored on those tenders regarded as being responsive, when (65 points) have been achieved. Only if a total of 65 points for the criteria below are achieved, will the tenderer be evaluated further.

Description	Reference	Scoring				Max Score
Company's Previous Experience	(Schedule 4 - T.2.2 Returnable Schedules)	(15) More than 5 similar projects in construction of geo-composite liners for either landfill cells or mining applications within the RSA	(10) Between 3- and 5-similar projects in construction of geo-composite liners for either landfill cells or mining applications within the RSA	(5) Less than 3 similar projects in construction of geo-composite liners for either landfill cells or mining applications within the RSA	(3) No similar projects in construction of geo-composite liners for either landfill cells or mining applications within the RSA	15
		(15) At least 1 similar project in construction of geo-composite liners for either landfill cells or mining applications within the RSA with a value of R 100 million and above	(10) At least 1 similar project in construction of geo-composite liners for either landfill cells or mining applications within the RSA with a value of R 50 million - R 100 million	(5) At least 1 similar project in construction of geo-composite liners for either landfill cells or mining applications within the RSA with a value of less than R 50 million		15
Contract Manager: Highest Education	(Schedule 8 - T.2.2. Returnable Schedules)	(5) B- Degree, Diploma, Honours, Masters or higher in engineering/project management		(3) Other Education in engineering/project management		5

Contract Manager: Professional Registration	(Schedule 8 - T.2.2. Returnable Schedules	(10) Pr Eng or Pr CM (with Honours, Masters or higher)	(8) Pr Eng or Pr CM (with B-Degree)	(4) Pr Tech Eng or Pr CM (with Nat Dpl)	(3) No Professional Registration	10
Contract Manager: Experience	(Schedule 8 - T.2.2. Returnable Schedules	(25) ≥ 5 years relevant contract experience in composite liner landfill construction	(20) ≥ 5 years relevant contract management experience	(15) ≥ 3 years relevant contract management experience	(10) <3 years relevant contract management experience	25
Site Agent: Highest Education	(Schedule 8 - T.2.2. Returnable Schedules	(5) Tertiary Qualification in Civil Engineering		(3) Other Education		5
Site Agent: Experience	(Schedule 8 - T.2.2. Returnable Schedules	(25) ≥ 7 years relevant experience as site agent in composite liner landfill construction	(20) ≥ 5 years relevant experience as site agent in composite liner landfill construction	(15) ≥ 3 years relevant experience as site agent in composite liner landfill construction	(10) <3 years relevant experience as site agent in composite liner landfill construction	25
Total						100

A **similar project** refers to construction of geo-composite liners for either landfill cells or mining applications within the RSA.

COMPANY EVALUATION CRITERION

Tenderers will receive relevant scores associated with the number of similar projects in construction of geo-composite liners for either landfill cells or mining applications within the RSA. Refer to the table above for a measurement of how points will be awarded against this criterion.

A detailed list of successfully completed projects must be completed in **Schedule 4, Schedule of work experience**.

CONTRACT MANAGER AND SITE AGENT EVALUATION CRITERION

Detailed, project specific CVs from Contract Manager and Site Agent to be included in **Schedule 8**, of the Returnable Documents. This will be used in allocating a score according to the different criteria to be measured according to the table. Failure to do so during tender phase will lead to be awarded the lowest score according to the table above. Refer to the table above for a measurement of how points will be awarded against this criterion.

The Contract Manager will be awarded points for the degree of highest education obtained, Professional registration as well as his/her experience in composite liner landfill construction. The Site Agent will be measured against his/her highest education as well as experience as site agent in composite liner landfill construction.

If, during construction, the contractor wishes to replace the Contract Manager or / as well as Site Agent, the contractor will apply in writing to the Engineer as per clause 4.12 of the GCC 2015. Only similarly experienced and competent Contract Manager and Site Agents will be considered.

C.3.11.10 Risk Analysis

Notwithstanding compliance with regard to CIDB registration or any other requirements of the tender, the employer will perform a risk analysis in respect of the following:

- reasonableness of the financial offer

- b) reasonableness of unit rates and prices
 - c) reasonableness of the Contract Participation Goals tendered.
 - d) the tenderer's ability to fulfil its obligations in terms of the tender document, that is, that the tenderer can demonstrate that he/she possesses the necessary professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience, reputation, personnel to perform the contract, etc.
- The outcome of the risk analysis will be included in the report to the evaluation committee.

C3.13 Acceptance of tender offer

Add the following to C.3.13:

C.3.13.1 Tender offers will only be accepted if:

- a) the tenderer is registered and in good standing with the South African Revenue Service (SARS) and has submitted evidence in the form of a Tax Compliance Status Pin issued by SARS.
- b) the tenderer or any of its directors is not 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.
- c) the tenderer has not:
 - i) abused the Employer's Supply Chain Management System; or
 - ii) failed to pay municipal rates and taxes or service charges and such rates, taxes and charges are in arrears for more than three months.
- d) 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.

C.3.13.2 Disputes, objections, complaints and queries

In terms of Regulations 49 and 50 of the Local Government: Municipal Finance Management Act, 2003 – Municipal Supply Chain Management Regulations (Notice 868 of 2005):

- a) Persons aggrieved by decisions or actions taken by the Cape Winelands District Municipality in the implementation of its supply chain management system, may lodge within 14 days of the decision or action, a written objection or complaint or query or dispute against the decision or action.
- b) Objections, complaints, queries and disputes must be submitted in writing to the Municipal Manager, PO Box 100, Stellenbosch, 7599.

C.3.13.3 Appeals

- a) In terms of Section 62 of the Systems Act 32 of 2000 a person whose rights are affected by a decision taken by the Cape Winelands District Municipality in the implementation of its supply chain management system, may appeal against that decision by giving written notice of the appeal and reasons to the Municipal Manager within 21 days of the date of the notification of the decision.
- b) An appeal must contain the following:
 - i) Reasons and/or grounds for the appeal
 - ii) The way in which the appellants rights have been affected
 - iii) Remedy sought by appellant
- c) Appeals must be submitted in writing to the Municipal Manager, PO Box 100, Stellenbosch, 7599.

C.3.13.4 Right to approach the courts and rights in terms of Promotion of Administrative Justice Act (Act 3 of 2000) and Promotion of Access to Information (Act 2 of 2000)

Clauses F.3.13.2 and F.3.13.3 do not influence any affected person's rights to approach the High Court at any time or its rights in terms of the Promotion of Administrative Justice Act and Promotion of Access to Information Act.

- a) All legal process and pleadings must be served on the Municipal Manager, PO Box 100, Stellenbosch, 7599.
- b) All requests in terms of PAJA and PAIA must be submitted in writing to the Municipal Manager, PO Box 100, Stellenbosch, 7599.

C.3.16 Notice to unsuccessful tenderers

Replace the heading above with:

Notice to successful and unsuccessful tenderers.

Add the following to C.3.16.1:

C.3.16.1 Before accepting the tender of the successful tenderer the Employer shall notify the successful tenderer in writing of the decision of the Employer's Bid Adjudication Committee to award the tender to the successful tenderer. No rights shall accrue to the successful tenderer in terms of this notice, and only once the processes described in C.3.13.2 and C.3.13.3 above have been completed can the Employer sign the Acceptance part of the Form of Offer and Acceptance.

Replace sub-clause C.3.16.2 with the following:

C.3.16.2 The Employer shall, at the same time as notifying the successful tenderer of the Bid Adjudication Committee's decision to award the tender to the successful tenderer, also give written notice to the other tenderers informing them that they have been unsuccessful.

C.3.17 **Provide copies of the contract**

Add the following:

The number of paper copies of the signed contract to be provided by the Employer is one.

C.4 Additional Conditions of Tender

The additional conditions of tender are:

C.4.1 Compliance with Occupational Health and Safety Act 1993

Tenderers are to note the requirements of the Occupational Health and Safety Act No. 85 of 1993 and the Construction Regulations 2014 issued in terms of Section 43 of the Act. The tenderer shall be deemed to have read and fully understood the requirements of the above Act and Regulations and to have allowed for all costs in compliance therewith.

In this regard the successful Tenderer shall submit after award, a detailed Health and Safety Plan in respect of the Works in order to demonstrate the necessary competencies and resources to perform the construction work all in accordance with the Act and Regulations. Such Health and Safety Plan shall cover inter-alia the following details:

- (1) Management Structure, Site Supervision and Responsible Persons including a succession plan.
- (2) Contractor's induction training programme for employees, sub-contractors and visitors to the Site.
- (3) Health and safety precautions and procedures to be adhered to in order to ensure compliance with the Act, Regulations and Safety Specifications.
- (4) Regular monitoring procedures to be performed.
- (5) Regular liaison, consultation and review meetings with all parties.
- (6) Site security, welfare facilities and first aid.
- (7) Site rules and fire and emergency procedures.

Tenderers are to note that the Contractor is required to ensure that all sub-contractors or others engaged in the performance of the contract also comply with the above requirements.

The Tenderers are to note that they will require to obtain a work permit from the Department of Labour prior to the commencement of the works.

The Contractor shall prepare and maintain a Health and Safety File in respect of the project, which shall be available for inspection on Site at all times and handed over to the Employer on Final Completion of the project.

The Contractor is required to submit to the Employer the Occupational Health and Safety Agreement (included in C1.4 of the Contract Document) and a letter of good standing from the Compensation Commissioner, or a licensed compensation insurer, within 14 days after the Commencement Date of the contract.

C.4.2 Claims arising after submission of tender

No claim for any extras arising out of any doubt or obscurity as to the true intent and meaning of anything shown on the Contract Drawings or contained in the Conditions of Contract, Scope of Work and Pricing Data, will be admitted by the Employer after the submission of any tender and the Tenderer shall be deemed to have:

- 1) inspected the Contract Drawings and read and fully understood the Conditions of Contract.
- 2) read and fully understood the whole text of the Scope of Work and Pricing Data and thoroughly acquainted himself with the nature of the works proposed and generally of all matters which may influence the Contract.
- 3) visited the site of the proposed works, carefully examined existing conditions, the means of access to the site, the conditions under which the work is to be done, and acquainted himself with any limitations or restrictions that may be imposed by the Municipal or other Authorities in regard to access and transport of materials, plant and equipment to and from the site and made the necessary provisions for any additional costs involved thereby.
- 4) requested the Employer or his duly authorised agent to make clear the actual requirements of anything shown on the Contract Drawings or anything contained in the Scope of Work and Pricing Data, the exact meaning or interpretation of which is not clearly intelligible to the Tenderer.
- 5) received any Addenda to the tender documents which have been issued in accordance with the Employer's Supply Chain Management Policy.

Before submission of any tender, the Tenderer should check the number of pages, and if any are found to be missing or duplicated, or the figures or writing indistinct, or if the Pricing Data contain any obvious errors, the Tenderer must apply to the Employer's agent at once to have the same rectified, as no liability will be admitted by the Employer in respect of errors in any tender due to the foregoing.

C.4.3 Imbalance in tendered rates

In the event of tendered rates or lump sums being declared by the Employer to be unacceptable to it because they are either excessively low or high or not in proper balance with other rates or lump sums, the Tenderer may be required to produce evidence and advance arguments in support of the tendered rates or lump sums objected to. If, after submission of such evidence and any further evidence requested, the Employer is still not satisfied with the tendered rates or lump sums objected to, it may request the tenderer to amend these rates and lump sums along the lines indicated by it.

The Tenderer will then have the option to alter and/or amend the rates and lump sums objected to and such other related amounts as are agreed on by the Employer, but this shall be done without altering the tender offer as tendered or, if applicable, the corrected total of prices in accordance with C.3.9.3.

Should the Tenderer fail to amend his Tender in a manner acceptable to the Employer, the Employer may reject the Tender.

C.4.4 Invalid tenders

Tenders shall be considered invalid and shall be endorsed and recorded as such in the tender opening record, by the responsible official who opened the tender, in the following circumstances:

- a) if the tender offer (the tender price/amount) is not submitted on the Form of Offer and Acceptance bound into this tender document (form C1.1, Part C1: Agreements and Contract Data);
- b) if the tender is not completed in non-erasable ink;
- c) if the Form of Offer and Acceptance has not been signed;
- d) if the Form of Offer and Acceptance is signed, but the name of the tenderer is not stated or is indecipherable.

C.4.5 General supply chain management conditions applicable to tenders

In terms of its Supply Chain Management Policy, the Employer may not consider a tender unless the provider who submitted the tender:

- a) has furnished the Employer with that provider's:
 - full name;
 - identification number or company or other registration number; and
 - tax reference number and VAT registration number, if any;
 - Certificate of attendance at a compulsory site inspection, where applicable.
- b) has indicated whether:
 - the provider is in the service of the state, or has been in the service of the state in the previous twelve months;
 - the provider is not a natural person, whether any of the directors, managers, principal shareholders or stakeholders is in the service of the state, or has been in the service of the state in the previous twelve months; or
 - whether a spouse, child or parent of the provider or of a director, manager, share holder or stakeholder referred to above is in the service of the state, or has been in the service of the state in the previous twelve months.

Irrespective of the procurement process followed, the Employer is prohibited from making an award to:

- a person who is in the service of the state;
- a juristic entity of which any director, manager, principal shareholder or stakeholder is in the service of the state;
- an advisor or consultant contracted with the Employer; or
- a person, advisor or corporate entity involved with the bid specification committee, or a director of such corporate entity.

In this regard, tenderers shall complete Schedule 1, Part T2.2: Returnable Schedules: Compulsory Enterprise Questionnaire. Failure to complete these schedules may result in the tender not being considered.

C.4.6 Combating abuse of the Supply Chain Management Policy

In terms of the Supply Chain Management Policy, the Employer may reject the tender of any tenderer if that tenderer or any of its directors has:

- a) failed to pay municipal rates and taxes or municipal service charges and such rates, taxes and charges are in arrears for more than three months;
- b) failed, during the last five years, to perform satisfactorily on a previous contract with the Employer or any other organ of state after written notice was given to that tenderer that performance was unsatisfactory;
- c) abused the supply chain management system of the Employer or has committed any improper conduct in relation to this system
- d) been convicted of fraud or corruption during the past five years;

- e) wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
- f) been listed with the Register of Tender Defaulters in terms of Section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004) or has been listed on National Treasury's database as a person or juristic entity prohibited from doing business with the public sector.

In this regard, tenderers shall complete Schedule 14 and 15, Part T2.2: Returnable Schedules: Certificate of Independent Tender Determination and Declaration in terms of the Municipal Finance Management Act. Failure to complete these schedules may result in the tender not being considered.

C.4.7 UIF payments

The Tenderer shall submit to the Employer a letter from the Industrial Council indicating his or her good standing with regard to UIF payments upon being requested to do so.

C.4.8 Price variations

The Contract Price shall not be subject to any contract price adjustment, the rates and prices tendered in the bills of quantities shall be final and binding throughout the period of the contract. However, price adjustments for variations in the costs of special materials may be applicable where the Employer specifies such materials and the relevant information in the Contract Data.

Notwithstanding the above, if, as a result of any extension of time granted, the duration of the contract period exceeds one year, the contract will automatically be subject to contract price adjustment for that period by which the extended contract period exceeds such one year in strict accordance with Part C1.2: Contract Data.

C.4.9 Requests for contract documents, or parts thereof, in electronic format

The Employer shall not formally issue tender documents in electronic format as contemplated in C.2.13.3 and shall only issue tender documents in hardcopy. An electronic version of the issued tender documents may be made available to the tenderer, upon written request in terms of this clause, subject to the following:

- (a) Electronic copies of the contract document, or parts thereof, will only be provided to tenderers who have been issued with the tender documents as contemplated in C.1.2 in hardcopy.
- (b) The electronic version shall not be regarded as a substitute for the issued tender documents.
- (c) The Employer shall not accept tenders submitted in electronic format. Tenderers may not complete and submit a printed copy of the electronic version of the tender document or part thereof. Only those tenders that have been completed on the issued hard copy tender document shall be considered.
- (d) The Employer accepts no responsibility or liability arising from any reliance on or use of the electronic version provided in terms of this clause. The Employer further does not guarantee that the electronic version corresponds with the issued tender documents in all respects. Tenderers are alerted to the fact that electronic versions of the tender documents may not reflect any notices or addenda that amend the tender document.
- (e) Any non-compliance with these provisions, including effecting any unauthorised alterations to the tender document as contemplated in C.2.11, shall render the tender invalid. The Employer reserves the right to take any action against such tenderer allowed in law including, in circumstances where the tender had already been awarded, the right to cancel the contract.
- (f) In requesting the electronic version of the tender document or parts thereof, the tenderer is deemed to have read, understood and accepted all of the above conditions.

Annex C

(normative)

Standard Conditions of Tender

C.1 General

C.1.1 Actions

C.1.1.1 The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in C.2 and C.3, timeously and with integrity, and behave equitably, honestly, and transparently, comply with all legal obligations, and not engage in anticompetitive practices.

C.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents, and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note: 1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.

2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect, or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance, or loyalty which would in any way affect any decisions taken.

C.1.1.3 The employer shall not seek, and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

C.1.2 Tender Documents

The documents issued by the employer for the purpose of a tender offer are listed in the tender data.

C.1.3 Interpretation

C.1.3.1 The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

C.1.3.2 These conditions of tender, the tender data and tender schedules which are required for tender evaluation purposes, shall form part of any contract arising from the invitation to tender.

C.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

- a) conflict of interest means any situation in which:
 - i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfil his or her duties impartially.
 - ii) an individual or tenderer can exploit a professional or official capacity in some way for their personal or corporate benefit; or
 - iii) incompatibility or contradictory interests exist between an employee and the tenderer who employs that employee.
- b) comparative offer means the price after the factors of a non-firm price and all unconditional discounts it can be utilised to have been taken into consideration.
- c) corrupt practice means the offering, giving, receiving, or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process.

- d) fraudulent practice means the misrepresentation of the facts to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels.

C.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be readily read, copied, and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

C.1.5 Cancellation and Re-Invitation of Tenders

C.1.5.1 An employer may, prior to the award of the tender, cancel a tender if-

- a) due to changed circumstances, there is no longer a need for the engineering and construction works specified in the invitation.
- b) funds are no longer available to cover the total envisaged expenditure; or
- c) no acceptable tenders are received.
- d) there is a material irregularity in the tender process.

C.1.5.2 The decision to cancel a tender invitation must be published in the same way the original tender invitation was advertised

C.1.5.3 An employer may only with the prior approval of the relevant treasury cancel a tender invitation for the second time.

C.1.6 Procurement procedures

C.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to C.3.13, be concluded with the tenderer who in terms of C.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

C.1.6.2.2 All responsive tenderers or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the tender data shall be invited to enter competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information.

Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified, and fine-tuned to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning, or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

C.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to revise their tender offer based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

C.1.6.2.4 The contract shall be awarded in accordance with the provisions of C.3.11 and C.3.13 after tenderers have been requested to submit their best and final offer.

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the

tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

C.1.6.3.2 Option 2

C.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

C.1.6.3.2.2 The employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data and award the contract in terms of these conditions of tender.

C.2 Tenderer's obligations

C.2.1 Eligibility

C.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.

C.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

C.2.2 Cost of tendering

C.2.2.1 Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer comply with requirements.

C.2.2.2 The cost of the tender documents charged by the employer shall be limited to the actual cost incurred by the employer for printing the documents. Employers must attempt to make available the tender documents on its website so as not to incur any costs pertaining to the printing of the tender documents.

C.2.3 Check documents

Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.

C.2.4 Confidentiality and copyright of documents

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

C.2.5 Reference documents

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

C.2.6 Acknowledge addenda

Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary, apply for an extension to the closing time stated in the tender data, to take the addenda into account.

C.2.7 Clarification meeting

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

C.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five (5) working days before the closing time stated in the tender data.

C.2.9 Insurance

Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

C.2.10 Pricing the tender offer

C.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes, and levies being those applicable fourteen (14) days before the closing time stated in the tender data.

C.2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

C.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

C.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

C.2.11 Alterations to documents

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations.

C.2.12 Alternative tender offers

C.2.12.1 Unless otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

C.2.12.2 Accept that an alternative tender offer must be based only on the criteria stated in the tender data or criteria otherwise acceptable to the employer.

C.2.12.3 An alternative tender offer must only be considered if the main tender offer is the winning tender.

C.2.13 Submitting a tender offer

C.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

C.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

C.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.

C.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

- C.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.
- C.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked "financial proposal" and place the remaining returnable documents in an envelope marked "technical proposal". Each envelope shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.
- C.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.
- C.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.
- C.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

C.2.14 Information and data to be completed in all respects

Accept that tender offers, which do not provide all the data or information requested completely and, in the form, required, may be regarded by the employer as non-responsive.

C.2.15 Closing time

- C.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.
- C.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

C.2.16 Tender offer validity

- C.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.
- C.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.
- C.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted. If the validity period stated in C.2.16 lapses before the employer evaluating tender, the contractor reserves the right to review the price based on Consumer Price Index (CPI).
- C.2.16.4 Where a tender submission is to be substituted, a tenderer must submit a substitute tender in accordance with the requirements of C.2.13 with the packages clearly marked as "SUBSTITUTE".

C.2.17 Clarification of tender offer after submission

Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: Sub-clause C.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.

C.2.18 Provide other material

- C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment.

Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

C.2.18.2 Dispose of samples of materials provided for evaluation by the employer, where required.

C.2.19 Inspections, tests, and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.

C.2.20 Submit securities, bonds, and policies

If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies, and certificates of insurance required in terms of the conditions of contract identified in the contract data.

C.2.21 Check final draft

Check the final draft of the contract provided by the employer within the time available for the employer to issue the contract.

C.2.22 Return of other tender documents

If so, instructed by the employer, return all retained tender documents within twenty-eight (28) days after the expiry of the validity period stated in the tender data.

C.2.23 Certificates

Include in the tender submission or provide the employer with any certificates as stated in the tender data.

C.3 The employer's undertakings

C.3.1 Respond to requests from the tenderer

C.3.1.1 Unless otherwise stated in the tender Data, respond to a request for clarification received up to five (5) working days before the tender closing time stated in the Tender Data and notify all tenderers who collected tender documents.

C.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if consequently:

- a) an individual firm, or a joint venture, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements.
- b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
- c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

C.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until three (3) working days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who collected tender documents.

C.3.3 Return late tender offers

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

C.3.4 Opening of tender submissions

C.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.

C.3.4.3 Make available the record outlined in C.3.4.2 to all interested persons upon request.

C.3.5 Two-envelope system

C.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

C.3.5.2 Evaluate functionality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the functionality evaluation more than the minimum number of points for functionality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any points claimed on BBBEE status level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

C.3.6 Nondisclosure

Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price, and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

C.3.7 Grounds for rejection and disqualification

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

C.3.8 Test for responsiveness

C.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

- a) complies with the requirements of these Conditions of Tender,
- b) has been properly and fully completed and signed, and
- c) is responsive to the other requirements of the tender documents.

C.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer's opinion, would:

- a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
- b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
- c) affect the competitive position of other tenderers presenting responsive tenders if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

C.3.9 Arithmetical errors, omissions, and discrepancies

C.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

C.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with C.3.11 for:

- a) the gross misplacement of the decimal point in any unit rate.
- b) omissions made in completing the pricing schedule or bills of quantities; or
- c) arithmetic errors in:
 - (i) line-item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
 - (ii) the summation of the prices.

C.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.

C.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

- a) If bills of quantities or pricing schedules apply and there is an error in the line-item total resulting from the product of the unit rate and the quantity, the line-item total shall govern, and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line-item total as quoted shall govern, and the unit rate shall be corrected.
- b) Where there is an error in the total of the prices either because of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern, and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

C.3.10 Clarification of a tender offer

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

C.3.11 Evaluation of tender offers

The Standard Conditions of Tender standardize the procurement processes, methods, and procedures from the time that tenders are invited to the time that a contract is awarded. They are generic in nature and are made project specific through choices that are made in developing the Tender Data associated with a specific project.

Conditions of tender are the document that establishes a tenderer's obligations in submitting a tender and the employer's undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to conduct the process of offer and acceptance in terms of a set of standard procedures.

The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following system requirements:	
Requirement	Qualitative interpretation of goal
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneous and timely access to participating parties to the same information.
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parties.
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are restrictions from doing business with the employer, lack of capability or capacity, legal impediments, and conflicts of interest.
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best value outcomes.
Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain best value outcomes in respect of quality, timing and price, and least resources to effectively manage and control procurement processes.

The activities associated with evaluating tender offers are as follows:

- a) Open and record tender offers received
- b) Determine whether tender offers are complete
- c) Determine whether tender offers are responsive
- d) Evaluate tender offers

- e) Determine if there are any grounds for disqualification
- f) Determine acceptability of preferred tenderer
- g) Prepare a tender evaluation report
- h) Confirm the recommendation contained in the tender evaluation report

C.3.11.1 General

The employer must appoint an evaluation panel of not less than three persons conversant with the proposed scope of works to evaluate each responsive tender offer using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

C.3.12 Insurance provided by the employer

If requested by the proposed successful tenderer, submit for the tenderer's information the policies and / or certificates of insurance which the conditions of contract identified in the contract data, require the employer to provide.

C.3.13 Acceptance of tender offer

Accept the tender offer; if in the opinion of the employer, it does not present any risk and only if the tenderer:

- a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement;
- b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise, and the personnel, to perform the contract.
- c) has the legal capacity to enter the contract.
- d) is not; insolvent, in receivership, under Business Rescue as provided for in chapter 6 of the Companies Act No. 2008, bankrupt or being wound up, has his/her affairs administered by a court or a judicial officer, has suspended his/her business activities or is subject to legal proceedings in respect of any of the foregoing.
- e) complies with the legal requirements, if any, stated in the tender data; and
- f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

C.3.14 Prepare contract documents

C.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

- a) addenda issued during the tender period,
- b) inclusion of some of the returnable documents and
- c) other revisions agreed between the employer and the successful tenderer.

C.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

C.3.15 Complete adjudicator's contract

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

C.3.16 Registration of the award

An employer must, within twenty-one (21) working days from the date on which a contractor's offer to perform a construction works contract is accepted in writing by the employer, register and publish the award on the CIDB Register of Projects.

C.3.17 Provide copies of the contracts

Provide to the successful tenderer the number of copies stated in the Tender Data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

C.3.18 Provide written reasons for actions taken

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.

Part T2: Returnable Documents

	Pages
T2.1 List of Returnable Documents	29-30
T2.2 Returnable Schedules	31-61

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

T2.1 List of Returnable Documents

The tenderer must complete the following Returnable Documents in **black ink**:

1. Returnable Schedules required for tender evaluation purposes

	Pages
1. COMPULSARY ENTERPRISE QUESTIONNAIRE	32-33
2. SITE VISIT / CLARIFICATION MEETING CERTIFICATE	34
3. AUTHORITY OF SIGNATORY	35
4. SCHEDULE OF WORK EXPERIENCE	36
5. SCHEDULE OF CONSTRUCTION PLANT	37-38
6. CONFIRMATION OF ENTERPRISE REGISTRATION	39
7. SCHEDULE OF SUB CONTRACTORS.....	40
8. DETAILS OF SITE AGENT'S AND GENERAL FOREMAN'S EXPERIENCE	41
9. CERTIFICATE OF CONTRACTOR REGISTRATION WITH CIDB.....	42
10. CERTIFICATE FOR MUNICIPAL SERVICES AND PAYMENTS TO SERVICE PROVIDER	43
11. CREDIT ORDER INSTRUCTION	44

2. Other documents required for tender evaluation purposes

- Joint Venture Agreement (if applicable) - append to Schedule 3.
- Documentary evidence / proof of registration and verification on Cape Winelands District Municipality and the Central Supplier Database – append to schedule 6.
- A Certificate of Contractor Registration issued by the Construction Industry Development Board append to Schedule 9.
- A recent municipal account appended to Schedule 10.
- Valid Tax Clearance Certificate pin issued by the South African Revenue Services – append to schedule 17.
- Either an original or a valid B-BBEE status level verification certificate in terms of the Construction Sector Charter on Black Economic Empowerment issued by a Verification Agency accredited by SANAS or a Registered Auditor approved by IRBA, or an Accounting Officer as contemplated in the CCA and proof of Locality – append to Schedule 18.

3. Returnable Schedules that will be incorporated into the Contract

12: RECORD OF ADDENDA TO TENDER DOCUMENTS	45
13: ALTERATIONS / AMENDMENTS BY TENDERER	46
14: DECLARATION OF INTEREST (MBD4).....	47-50
15: DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES (MBD8) ..	51-52
16: CERTIFICATE OF INDEPENDENT BID DETERMINATION (MBD9)	53-55
17: TAX CLEARANCE CERTIFICATE REQUIREMENTS (MBD2)	56

Preferencing Schedule

18: PREFERENCING SCHEDULE WHERE PREFERENCES ARE GRANTED IN RESPECT OF SPECIFIC GOALS (MBD 6.1)	57-61
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5. C1.1 The offer portion of the C1.1 Form of Offer and Acceptance
6. C1.2 Contract Data (Part 2)
7. C1.4 Occupational Health and Safety Agreement
8. C2.2 Bills/Schedules of Quantities

Note: Tenderers must complete these schedules / data sheets / forms in black ink

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

T2.2 Returnable Schedules

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 1 : COMPULSORY ENTERPRISE QUESTIONNAIRE

The following particulars must be furnished. In the case of a joint venture, **separate** enterprise questionnaires in respect of each partner must be completed and submitted.

Section 1: Name of enterprise:

Address of enterprise:

.....

.....

Section 2: VAT registration number, if any:

Section 3: CIDB registration number, if any:

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

* Complete only if sole proprietor or partnership and attach separate page if more than 3 partners

Section 5: Particulars of companies and close corporations

Company registration number

Close corporation number

Tax reference number

Section 6: Record of service of the state

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:

- | | |
|--|---|
| <input type="checkbox"/> a member of any municipal council | <input type="checkbox"/> 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) |
| <input type="checkbox"/> a member of any provincial legislature | <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity |
| <input type="checkbox"/> a member of the National Assembly or the National Council of Province | <input type="checkbox"/> an employee of Parliament or a provincial legislature |
| <input type="checkbox"/> a member of the board of directors of any municipal entity | |
| <input type="checkbox"/> an official of any municipality or municipal entity | |
| <input type="checkbox"/> an advisor or consultant contracted by the municipality | |

If any of the above boxes are marked, disclose the following:

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 months

*insert separate page if necessary

Section 7: Record of spouses, children and parents in the service of the state

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 been in the service of any of the following:

- | | |
|--|---|
| <input type="checkbox"/> a member of any municipal council | <input type="checkbox"/> 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) |
| <input type="checkbox"/> a member of any provincial legislature | |
| <input type="checkbox"/> a member of the National Assembly or the National Council of Province | <input type="checkbox"/> a member of an accounting authority of any national or provincial public entity |
| <input type="checkbox"/> a member of the board of directors of any municipal entity | <input type="checkbox"/> an employee of Parliament or a provincial legislature |
| <input type="checkbox"/> an official of any municipality or municipal entity | |

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 months

*insert separate page if necessary

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

- authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my/our tax matters are in order;
- 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;
- 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;
- 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;
- confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

SIGNED ON BEHALF OF TENDERER:

.....

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 2 : CLARIFICATION MEETING CERTIFICATE

This is to certify that , (Tenderer)

of (Address)

.....
was represented by the person (s) named below at the compulsory meeting held for all tenders at.
.....(location) on.(date), starting at.

We acknowledge that the purpose of the meeting was to acquaint ourselves with the site of the works and / or matters incidental to doing the work specified in the tender documents in order for 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: Signature :.....

Capacity:

Name: Signature :.....

Capacity:.....

Attendance of the above persons at the meeting is confirmed by the Employer's representative, namely:

Name: Signature :.....

Capacity: Date & Time:

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 3 : AUTHORITY OF SIGNATORY

Assurance shall be given at the time of submission of the tender that the tender has been signed by someone properly authorised thereto by resolution of the Directors, Members or Partners. Tenderers shall submit with their tenders the following information:

Single Company, Close Corporation or Partnership

Signatories for companies shall confirm their authority by attaching to this form a copy of the relevant resolution of the board of directors, duly signed and dated.

By resolution of the board of directors taken on (Date)

Mr/Ms (Print Name)

has been duly authorized to sign all documents in connection with this tender / contract on behalf of : ..

(Print Company Name).....

.....

Signed on behalf of Company :

In his/her capacity as :

Date :

Joint Ventures

We, the undersigned, are submitting this tender offer in joint venture and hereby authorize Mr/Ms

....., authorised signatory of the company, close corporation or partnership

....., acting in the capacity of lead partner, to sign all documents in connection with the tender offer and any contract resulting from it on our behalf.

NAME OF FIRM	ADDRESS	DULY AUTHORISED SIGNATORY
Lead partner		Signature..... Name..... Designation.....
		Signature..... Name..... Designation.....
		Signature..... Name..... Designation.....

Note :

A copy of the Joint Venture Agreement showing clearly the **percentage contribution of each partner** to the Joint Venture shall be appended to this schedule.

SIGNED ON BEHALF OF TENDERER:

.....

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 4 : SCHEDULE OF WORK EXPERIENCE

The tenderer shall insert in the spaces provided below a list of similar completed contracts awarded to him and those currently being undertaken.

COMPLETED CONTRACTS				
EMPLOYER (NAME, TEL No. AND FAX No.)	CONSULTING ENGINEER (NAME, TEL No. AND FAX No.)	NATURE OF WORK	VALUE OF WORK R(m)	DATE COMPLETED

SIGNED ON BEHALF OF TENDERER:

.....

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 5: SCHEDULE OF CONSTRUCTION PLANT

The tenderer shall state below what construction plant will be available for this Contract. The tenderer shall differentiate, if applicable, between construction plant immediately available and construction plant which will become available by virtue of outstanding orders and indicate what further construction plant will be acquired or hired for the work should he be awarded the Contract.

CONSTRUCTION PLANT IMMEDIATELY AVAILABLE

DESCRIPTION, SIZE, CAPACITY	NUMBER

CONSTRUCTION PLANT ON ORDER

(State details of arrangements made, with delivery dates)

DESCRIPTION, SIZE, CAPACITY	NUMBER

CONSTRUCTION PLANT THAT WILL BE ACQUIRED OR HIRED

(State details of delivery arrangements)

DESCRIPTION, SIZE, CAPACITY	NUMBER

Number of sheets, appended by the tenderer to this Schedule (If nil, enter NIL).

SIGNED ON BEHALF OF TENDERER:

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWD

SCHEDULE 6: CONFIRMATION OF ENTERPRISE REGISTRATION

I/We understand that in terms of the Employer's Procurement Policy, tenderers are required to be registered and verified on the Cape Winelands District Municipality Supplier and the National Treasury Central Suppliers Database.

Registration as Service Provider on the Cape Winelands District Municipality Database

I/We hereby confirm my/our registration on the Cape Winelands District Municipality Supplier Database and claim any evaluation points for preference as may be applicable in terms of such registration:

COMPANY NAME	REGISTERED YES/NO	REGISTRATION NUMBER IF APPLICABLE

Registration as Service Provider on the Central Supplier Database

I/We hereby confirm my/our registration on the National Treasury Central Supplier Database section:

COMPANY NAME	UNIQUE REFERENCE No.	SUPPLIER NUMBER

In the case of a Joint Venture, list each party/member of the Joint Venture

I/We attach a printed copy of the Certificate of Company Registration on the Central Supplier Database and acknowledge that the validity (active status) of this certificate is dependent upon the validity of the tax clearance certificate attached to Schedule 6.

In the case of a Joint Venture, a printed copy of the Certificate of the Company Registration on the Central Supplier Database must be provided for each member of the Joint Venture.

I/We also acknowledge that the "Active" status of the Company Registration as reflected on the Central Supplier Database at the tender closing date, will be the only data used in the determination of responsiveness (refer to tender condition F.3.8.3) in the tender adjudication process and that the employer reserves the right to verify this information.

SIGNED ON BEHALF OF TENDERER:

.....

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDWM

SCHEDULE 7: SCHEDULE OF SUBCONTRACTORS

We notify you that it is our intention to employ the following Subcontractors for work in this contract.

Acceptance of this tender shall not be construed as approval of all or any of the listed subcontractors. Should any of the subcontractors not be approved subsequent to acceptance of the tender, this shall in no way invalidate this tender, and the tendered unit rates for the various items of work shall remain final and binding, even in the event of a subcontractor not listed below being approved by the Engineer.

(i) SUBCONTRACTORS			
Category/type	Subcontractor: Name/Address/Contact Person/Phone/Fax/Details of Organisation/Firm Experience	Items of work (pay items) to be undertaken by the Subcontractor	Estimated Cost of Work (Rand)
TOTAL (Excluding VAT)			

Number of sheets, appended by the tenderer to this Schedule (If nil, enter NIL).

SIGNED ON BEHALF OF TENDERER:

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 8: DETAILS OF CONTRACT MANAGER AND SITE AGENT'S EXPERIENCE

Tenderers shall set out in the Schedule hereunder details of the Contract Manager and Site Agent experience in composite liner landfill construction for which their Tender is submitted.

Failure to complete this Schedule may result in the Tender not being considered.

SITE AGENT	NAME: .....NQF LEVEL.....				
CONTRACT & CLIENT	NATURE OF WORK	POSITION HELD	VALUE WORK	OF	YEAR COMPLETED

GENERAL FOREMAN	NAME: .....NQF LEVEL.....				
CONTRACT & CLIENT	NATURE OF WORK	POSITION HELD	VALUE WORK	OF	YEAR COMPLETED

Number of sheets, appended by the tenderer to this Schedule (If nil, enter NIL).

SIGNED ON BEHALF OF THE TENDERER:

Detailed, project specific CVs from Contract Manager and Site Agent to be attached to this schedule.

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 9: CERTIFICATES OF CONTRACTOR REGISTRATION

CIDB Contractor Registration Certificate

A Certificate of Contractors Registration issued by the Construction Industry Development Board (CIDB) shall be attached to this schedule.

Where a tenderer satisfies CIDB Contractor grading designation requirements through joint venture formation, such tenderers must submit the Certificates of Contractor Registration in respect of each partner.

SIGNED ON BEHALF OF TENDERER:

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWD

SCHEDULE NO. 10: CERTIFICATE FOR MUNICIPAL SERVICES AND PAYMENTS TO SERVICE PROVIDER

PART A: PROPERTY OWNED BY ENTERPRISE OR DIRECTORS

Please complete the following if property is owned by the enterprise, the proprietors, directors or partners in their personal capacity, which must be confirmed by the relevant municipality (**ATTACH COPY OF MUNICIPAL ACCOUNT(S) NOT OLDER THAN 30 DAYS:**

Name of account holder:

Account number:

Account number:

FOR MUNICIPAL USE ONLY

I/we hereby certify that the municipal account details of our client as indicated above is correct.

.....
Name of municipal official (print name)

.....
Signature of municipal official

Official date stamp of municipality

PART B: PROPERTY LEASED BY ENTERPRISE OR DIRECTORS

Please attach a sworn affidavit or a copy of your lease agreement if the property is leased by the enterprise or the proprietors or directors in their personal capacity, for which the aforementioned is not responsible for payment of municipal rates and taxes.

PART C: WHERE PROPERTY IS NOT OWNED OR LEASED BY ENTERPRISE OR DIRECTORS

Please attach a sworn affidavit from the proprietor or director of the enterprise confirming that the enterprise does not own or lease any property and that the aforementioned is not responsible for payment of any municipal rates and taxes.

I,....., the undersigned, certify that the information furnished on this declaration form is correct and that I/we have no undisputed commitments for municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 90 days.

.....
Signature for and on behalf of the bidder

.....
Date

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDWM

SCHEDULE NO. 11: CREDIT ORDER INSTRUCTIONS

It is the policy of the Cape Winelands District Municipality to pay all creditors by means of direct bank transfers. Please complete this information and acquire your banker's confirmation.

DETAILS OF FIRM/INSTITUTION

[illegible]

DETAILS OF MY/OUR BANK ACCOUNT ARE AS FOLLOWS:

NAME OF BANK																	
NAME OF BRANCH																	
BRANCH CODE																	
ACCOUNT NUMBER																	
TYPE OF ACCOUNT			<div>1 = Cheque</div> <div>2 = Savings</div>														

I/we hereby request and authorise the Cape Winelands district municipality to pay any amounts that may accrue to me/us to the credit of my/our bank account.

I/we understand that a payment advice will be supplied by the Cape Winelands District municipality in the normal way that will indicate the date on which funds will be available in my/our bank account and details of payment.

I/we further undertake to inform the Cape Winelands District municipality in advance of any change in my/our bank details and accept that this authority may only be cancelled by me/us by giving thirty days' notice by prepaid registered post.

.....
INITIALS AND SURNAME:

.....
 AUTHORISED SIGNATURE:

DATE:

.....
TELEPHONE NUMBER:

FOR BANK USE ONLY

I/we hereby certify that the details of our clients bank account as indicated on the credit order instruction is correct:

OFFICIAL DATE STAMP

AUTHORISED SIGNATURE

FOR FULL SUPPLIER ACCREDITATION ALL PARTS MUST BE COMPLETED AND SIGNED:

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 12 : RECORD OF ADDENDA TO TENDER DOCUMENTS

We confirm that the following communications received from the Employer before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer:		
	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Attach additional pages if more space is required.

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWD

SCHEDULE 13 : ALTERATIONS/ AMENDMENTS BY TENDERER

The Tenderer should record any deviations or qualifications he may wish to make to the tender documents in this Returnable Schedule. Alternatively, a tenderer may state such deviations and qualifications in a covering letter attached to his tender and reference such letter in this schedule.

The Tenderer's attention is drawn to clause F.3.8.2 of the Standard Conditions of Tender referenced in the Tender Data regarding the Employer's handling of material deviations and qualifications.

If no deviations or modifications are desired, the schedule hereunder is to be marked NIL and signed by the Tenderer.

No alternative Tender will be considered unless a Tender free of qualifications and strictly on the basis of the Tender Documents is also submitted.

PAGE/ITEM	CLAUSE/DESCRIPTION

Number of sheets, appended by the tenderer to this Schedule (If nil, enter NIL).

SIGNED ON BEHALF OF TENDERER:

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 14: DECLARATION OF INTEREST

MBD 4

1. No bid/database registration will be accepted from persons in the service of the state¹.
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/database registration. 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 the service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.
- 3 **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid/database registration.**

3.1 Full Name of bidder or his or her representative:.....

3.2 Identity Number:

3.3 Position occupied in the Company (director, trustee, shareholder²):

3.4 Company Registration Number:

3.5 Tax Reference Number:

3.6 VAT Registration Number:

3.7 The names of all directors / trustees / shareholders members, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below.

3.8 Are you presently in the service of the state?

YES

☐

NO

☐

3.8.1 If yes, furnish particulars.

.....
.....

3.9 Have you been in the service of the state for the past twelve months?

YES

☐

NO

☐

3.9.1 If yes, furnish particulars.

.....
.....

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and/or who may be involved with the evaluation and/or adjudication of this or any other prospective bid?

YES

☐

NO

☐

3.10.1 If yes, furnish particulars.

(Please write in BLOCK letters! - Add separate page if more than one.)

SA ID Number:		Relation:	
Surname:			
Full Names:			
Organ of State:		Persal No:	
3.11 Are you aware of any relationship (family, friend, other) between any other bidder/supplier and any persons in the service of the state who may be	YES		NO

involved with the evaluation and/or adjudication of this or any other prospective bid?

3.11.1 If yes, furnish particulars.

(Please write in BLOCK letters! - Add separate page if more than one.)

SA ID Number:		Relation:	
Surname:			
Full Names:			
Organ of State:		Persal No:	

3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in the service of the state?

YES

☐

NO

☐

3.12.1 If yes, furnish particulars.

(Please write in BLOCK letters! - Add separate page if more than one.)

SA ID Number:		Relation:	
Surname:			
Full Names:			
Organ of State:		Persal No:	

3.13 Is any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?

YES

☐

NO

☐

3.13.1 If yes, furnish particulars.

(Please write in BLOCK letters! - Add separate page if more than one.)

SA ID Number:		Relation:	
Surname:			
Full Names:			
Organ of State:		Persal No:	

3.14 Do you or any of the directors, trustees, managers, principle or shareholders, 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

☐

3.14.1 If yes, furnish particulars.

.....
.....

3.15 Is the supplier or any of its directors/partners listed on the National Treasury's database as a company or person prohibited from doing business with the public sector?

YES

☐

NO

☐

3.15.1 If yes, furnish particulars.

.....
.....

3.16 Is the supplier 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)?

YES

☐

NO

☐

3.16.1 If yes, furnish particulars.

.....
.....

3.17 Was the supplier 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

☐

3.17.1 If yes, furnish particulars.

.....
.....

3.18 Does the supplier 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

☐

3.18.1 If yes, furnish particulars.

.....
.....

3.19 Was any contract between the supplier 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

☐

3.19.1 If yes, furnish particulars.

.....
.....

4. Full details of directors / trustees / members / shareholders.

Full Name	Identity Number	State Employee Persal Number

Full Name	Identity Number	State Employee Peral Number

.....
Signature

.....
Date

.....
Capacity of Signatory

.....
Name of Bidder/Company/CC Name

MANDATORY SECTION: THIS DECLARATION WILL NOT BE EXCEPTED IF NOT CERTIFIED:

¹ MSCM Regulations: “in the service of the state” means to be –

- (a) a member of –
 - (i) any municipal council;
 - (ii) any provincial legislature; or
 - (iii) the national Assembly or the national Council of provinces;
- (b) a member of the board of directors of any municipal entity;
- (c) an official of any municipality or municipal entity;
- (d) an employee of any national or provincial department, national or provincial public entity 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 entity; or
- (f) an employee of Parliament or a provincial legislature.

² “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.

Commissioner of Oaths

Signed and sworn to before me at

.....

on this the day of 20 by the Deponent, who has acknowledged that he/she knows and understands the contents of this Affidavit, it is true and correct to the best of his/her knowledge and that he/she has no objection to taking the prescribed oath, and that the prescribed oath will be binding on his/her conscience.

.....
COMMISSIONER OF OATHS:

Position:

.....

Address:

.....

.....

Tel:

Apply official stamp of authority on this page:

This document is compulsory, in terms of Regulation 44 of the Supply Chain Management Regulations, to do business with any municipality – If not endorsed by a Commissioner of Oaths, or failure to submit it, will disqualify your business from the acquisition process. (Must be submitted annually)

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 15: DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

MBD 8

- 1 This Municipal Bidding Document must form part of all bids invited.
- 2 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 The bid of any bidder may be rejected if that bidder, or any of its directors have:
 - a. abused the municipality's / 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. willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
 - 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 **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**

Item	Question	Yes	No
4.1	<p>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?</p> <p>(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 <i>audi alteram partem</i> rule was applied).</p> <p>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.</p>	<p>Yes</p> <p><input type="checkbox"/></p>	<p>No</p> <p><input type="checkbox"/></p>
4.1.1	If so, furnish particulars:		
4.2	<p>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)?</p> <p>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.</p>	<p>Yes</p> <p><input type="checkbox"/></p>	<p>No</p> <p><input type="checkbox"/></p>
4.2.1	If so, furnish 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 <input type="checkbox"/>	No <input type="checkbox"/>
4.3.1	If so, furnish particulars:		
Item	Question	Yes	No
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 <input type="checkbox"/>	No <input type="checkbox"/>
4.4.1	If so, furnish 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 <input type="checkbox"/>	No <input type="checkbox"/>
4.7.1	If so, furnish particulars:		

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME)

CERTIFY THAT THE INFORMATION FURNISHED ON THIS
DECLARATION FORM 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.

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 16: CERTIFICATE OF INDEPENDENT BID DETERMINATION

MBD 9

- 1 This Municipal Bidding Document (MBD) must form part of all bids¹ invited.
- 2 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 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 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 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid:

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.

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: _____ that:

(Name of Bidder)

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; and
 - (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 consortium³ 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; or
 - (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.

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

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.

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 17: TAX CLEARANCE CERTIFICATE REQUIREMENTS

A copy of a Tax Compliance Status Pin, printed from the South African Revenue Service (SARS) website, must accompany the bid documents. The onus is on the bidder to ensure that their tax matters are in order with SARS. In the case of a Consortium/Joint Venture every member must submit a separate Tax Compliance Status Pin, printed from the SARS website, with the bid documents.

If a bid is not supported by a Tax Compliance Status Pin as an attachment to the bid documents, the Municipality reserves the right to obtain such documents after the closing date to verify that the bidder's tax matters are in order. If no such document can be obtained within a period as specified by the Municipality, the bid will be disqualified.

The Tax Compliance Status Pin will be verified by the Municipality on the SARS website.

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

SCHEDULE 18: PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022 (MBD 6.1)

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. 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); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 To be completed by the organ of state

- (a) The applicable preference point system for this tender is the 90/10 preference point system.

1.3 Points for this tender (even in the case of a tender for income-generating contracts) shall be awarded for:

- (a) Price; and
(b) Specific Goals.

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	90
SPECIFIC GOALS	10
Total points for Price and SPECIFIC GOALS	100

1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.

1.6 The organ of state 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 to preferences,

in any manner required by the organ of state.

2. DEFINITIONS

- (a) **“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;
- (b) **“price”** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;
- (c) **“Locality”** means an enterprise whose head office or primary place of business or regional or satellite office is located within the boundaries of the Cape Winelands District Municipal Area or Western Cape Province
- (d) **“Proof of locality”** means a –
 - 1) municipal account in the name of the tenderer not older than 90 days;
 - 2) lease agreement where the tenderer is the lessee of an official operating business premise; or
 - 3) an official letter from the bank confirming the registered business address of the tenderer;
- (e) **“Proof of B-BBEE status level of contributor”** means the B-BBEE status level certificate issued by an authorised body or person, a sworn affidavit as prescribed by the B-BBEE Codes of Good Practice; or any other requirement prescribed in terms of the Broad-Based Black Economic Empowerment Act.
- (f) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;
- (g) **“tender for income-generating contracts”** means a written offer in the form determined by an organ of state 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 organ of state and a third party that produces revenue for the organ of state, 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; and
- (h) **“the Act”** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

3.1.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

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

$$\begin{array}{ccc} \mathbf{80/20} & \mathbf{or} & \mathbf{90/10} \\ \\ \mathbf{Ps = 80 \left(1 - \frac{Pt - P_{min}}{P_{min}} \right)} & \mathbf{or} & \mathbf{Ps = 90 \left(1 - \frac{Pt - P_{min}}{P_{min}} \right)} \end{array}$$

Where

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

3.2. FORMULAE FOR DISPOSAL OR LEASING OF STATE ASSETS AND INCOME GENERATING PROCUREMENT

3.2.1. POINTS AWARDED FOR PRICE

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

$$\begin{array}{ccc} \text{80/20} & \text{or} & \text{90/10} \\ P_s = 80 \left(1 + \frac{P_t - P_{max}}{P_{max}} \right) & \text{or} & P_s = 90 \left(1 + \frac{P_t - P_{max}}{P_{max}} \right) \end{array}$$

Where

P_s = Points scored for price of tender under consideration

P_t = Price of tender under consideration

P_{max} = Price of highest acceptable tender

4. 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 goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this 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 points claimed are indicated per the table below.

(Note to organs of state: Where either the 90/10 or 80/20 preference point system is applicable, corresponding points must also be indicated as such.

Note to tenderers: The tenderer must indicate how they claim points for each preference point system.)

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by the organ of state)	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)
B-BBEE status level of contributor	5	10		
The promotion of enterprises located in the Western Cape Province for work to be done or services to be rendered in that province;	2.5	5		
The promotion of enterprises located in the Cape Winelands District Municipal area for work to be done or services to be rendered in that municipal area	2.5	5		

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm.....

4.4. Company registration number:

4.5. TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One-person business/sole propriety
- ☐ Close corporation
- ☐ Public Company
- ☐ Personal Liability Company
- ☐ (Pty) Limited
- ☐ Non-Profit Company
- ☐ State Owned Company

[TICK APPLICABLE BOX]

4.6. I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as

indicated in paragraph 1 of this form;

- iii) 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;
- iv) 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 and surname

Signature(s) of bidder(s).....

Date.....

Address.....

.....

Part C1: Agreements and Contract Data

	Pages
C1.1 Form of Offer and Acceptance (Agreement)	64-68
C1.2 Contract Data	69-76
C1.4 Occupational Health and Safety Agreement	77-78
C1.5 Enterprise Development Participation Goals	79

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

C1.1 Form of Offer and Acceptance

Offer

The employer, identified in the acceptance signature block, has solicited offers to enter into a contract for the procurement of:

CONTRACT NO. T 2023/022 – CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

The tenderer, identified in the offer signature block, has examined the documents listed in the tender data and addenda thereto as listed in the returnable schedules, and by submitting this offer has accepted the conditions of tender.

By the representative of the tenderer, deemed to be duly authorized, 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:

Rand.

..... (In words);

R (In figures)

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.

Signature(s)

Name(s)

Capacity

for the tenderer

(Name and
address of
organization/
tenderer
.....
.....

Name and
signature
of witness

Date

Acceptance

By signing this part of this 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: Agreements and contract data (which includes this agreement)
- Part C2: Pricing data
- Part C3: Scope of work
- Part C4: CWDM Supply Chain Policy
- Part C5: Site information

and drawings and documents or parts thereof, which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto as listed in the returnable 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 form of offer and acceptance. No amendments to or deviations from said documents are valid unless contained in this schedule.

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 securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data. Failure to fulfil 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 working 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(s)

Name(s)

Capacity

**for the
Employer** CAPE WINELANDS DISTRICT MUNICIPALITY
29 DU TOIT STREET
STELLENBOSCH
7599

Name and
signature
of witness

Date

Schedule of Deviations

Notes:

1. The extent of deviations from the tender documents issued by the employer before the tender closing date is limited to those permitted in terms of the conditions of tender.
2. A tenderer's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid, become the subject of agreements reached during the process of offer and acceptance, the outcome of such agreement shall be recorded here.
3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here.
4. Any change or addition to the tender documents arising from the above agreements and recorded here, shall also be incorporated into the final draft of the Contract.

1 Subject	.....
Details	.....

2 Subject	.....
Details	.....

3 Subject	.....
Details	.....

4 Subject	.....
Details	.....

By the duly authorised representatives signing this agreement, 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 returnable schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this agreement.

For the Tenderer:

Signature(s)

Name(s)

Capacity

(Name and
address of
organization/
tenderer)

Name and
signature
of witness Date

For the Employer:

Signature(s)

Name(s)

Capacity

(Name and
address of
organization) CAPE WINELANDS DISTRICT MUNICIPALITY
29 DU TOIT STREET,
STELLENBOSCH
7599

Name and
signature
of witness Date

Confirmation of Receipt

The Tenderer, (now Contractor), identified in the Offer part of this Agreement hereby confirms receipt from the Employer, identified in the Acceptance part of this Agreement, of one fully completed original copy of this Agreement, including the Schedule of Deviations (if any) today:

the.....(day) of(month) 20.....(year) at(place)

For the Contractor:

.....
Signature

.....
Name

.....
Capacity

Signature and name of witness:

.....
Signature

.....
Name

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL IN WORCESTER, CWDM

C1.2 Contract Data

Part 1: Contract Data provided by the Employer

GENERAL CONDITIONS OF CONTRACT

The following standardised General Conditions of Contract:

General Conditions of Contract for Construction Works (Third Edition) 2015

prepared by the South African Institution of Civil Engineering (SAICE) shall apply to and form the General Conditions of Contract for this contract. Copies of these conditions of contract are obtainable from the South African Institution of Civil Engineering (SAICE), Private Bag X200, Halfway House 1685, Tel: (011) 805 5947, Fax: (011) 805 5971, e-mail: civilinfo@saice.org.za.

Copies of the General Conditions of Contract are available for inspection and scrutiny at the offices of the Employer.

The Pro-formas bound with the General Conditions of Contract 2015, on pages 103 to 123 shall not apply to this Contract and shall be replaced with the documentation bound into this Contract Document.

The General Conditions of Contract make several references to the Contract Data for specific data, which together with these conditions collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the Contract. The Contract Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the general conditions of contract.

The General Conditions of Contract shall be read in conjunction with the variations, amendments and additions set out in the Contract Specific Data below. Each item of data given below is cross-referenced to the clause in the General Conditions of Contract to which it mainly applies.

The Contract Data and General Conditions of Contract shall have precedence over the Drawings, Scope of Work and Standardised Specifications in the interpretation of any ambiguity or inconsistency between these documents.

CONTRACT SPECIFIC DATA

The following contract specific data, referring to the General Conditions of Contract for Construction Works, Third Edition, 2015, are applicable to this Contract:

Clause 1.1.1.13:

The Defects Liability Period is **12** months.

Clause 1.1.1.14:

The time for achieving Practical Completion is **10 (ten) months**, inclusive of the 14 day period referred to in Clause 5.3.2 below, and inclusive of non-working days referred to in Clause 5.8.1 below, but exclusive of special non-working days (Clause 5.8.1).

Clause 1.1.1.15:

The **Employer** is the CAPE WINELANDS DISTRICT MUNICIPALITY, represented by the Deputy Director: Project Management and/or such other person or persons duly authorised thereto by the Employer in writing.

The name of the Employer is: CAPE WINELANDS DISTRICT MUNICIPALITY and is referred to in this Contract Document by the terms "Employer", "Cape Winelands District Municipality" or "Council" as the context provides.

Clause 1.1.1.26:

The Pricing Strategy is a Re-measurement Contract.

Add the following clauses after Clause 1.1.1.34:

- 1.1.1.35 **"Drawings"** means all drawings, calculations and technical information forming part of the Contract Documents and any modifications thereof or additions thereto from time to time approved in writing by the Engineer or delivered to the Contractor by the Engineer.
- 1.1.1.36 **"Letter of Notification"** means the letters of formal notification, signed by the Employer, of the decision of the Supply Chain Management Bid Adjudication Committee sent to all tenderers. The notification of the decision does not form part of the Employer's Acceptance of the successful tenderer's Offer and no rights shall accrue.

Clause 1.2.1.2:

The address of the Employer is: 29 Du Toit Street
STELLENBOSCH
7599

Physical address: 29 Du Toit Street
STELLENBOSCH
7599

Postal address: PO Box 100
STELLENBOSCH
7599

Clause 1.1.1.16:

The **Engineer**, referred to in the documents, is the firm of **Envitech Solutions (Pty) Ltd** acting through a director, an associate or an official authorised thereto in writing.

The name of the Engineer is: Envitech Solutions (Pty) Ltd or their successors duly appointed by the Employer

Clause 1.2.1.2:

The address of the Engineer is:

Physical address: 22 Seventh Avenue
NORTHMEAD
Benoni

Postal address: 22 Seventh Avenue
NORTHMEAD
Benoni
1501

E-mail address: brendon@envitech.co.za

Clause 3.1.3:

The Engineer 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:

1. Clause 3.2.1 Nomination of Engineer's Representative
2. Clause 3.2.4 Engineer's authority to delegate
3. Clause 5.8.1 Non-working times
4. Clause 5.11.1 Suspension of the Works
5. Clause 5.12.4 Acceleration instead of extension of time

Clause 4.3:

Add the following clause after Clause 4.3.2.:

- 4.3.3 The Employer and the Contractor shall enter into an agreement to complete the work required for the construction of the works in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act (Act 85 of 1993) and the Construction Regulations promulgated thereunder.

An agreement is included in the Contract Document (C1.4 of Contract Data) and shall be completed and submitted to the Employer together with a letter of good standing from the Compensation Commissioner (if not insured with a Licenced Compensation Insurer) within fourteen (14) days after the Commencement Date. The Contractor shall ensure that any letter of good standing shall be timeously renewed in order that it remains in full force for the duration of the Contract.

Clause 5.3.1:

The documentation required before commencement with Works execution is:

- (1) Health and Safety Plan (Refer to Clause 4.3)
- (2) Initial programme (Refer to Clause 5.6)
- (3) Security (Refer to Clause 6.2)
- (4) Insurance (Refer to Clause 8.6)
- (5) Occupational Health and Safety Agreement (C1.4 of the Contract Document)
- (6) Letter of Good Standing from the Compensation Commissioner (if not insured with a Licensed Compensation Insurer)
- (7) Complete CV of the Site Agent and the General Foreman

Clause 5.3.2:

The time to submit the documentation required before commencement with Works execution is 14 days.

Clause 5.4.2:

Access to and possession of the site shall not be exclusive to the Contractor insofar as the provisions of Clause 4.8 apply, and where ongoing use by the general public is required.

Add the following clause after Clause 5.4.3:

- 5.4.4 The Contractor shall bear all costs and charges for special and temporary rights of way required by him in connection with access to the Site.

Clause 5.8.1:

The non-working days are Sundays.

The special non-working days are:

- (1) All gazetted public holidays falling outside the year end break.
- (2) The year end break(s) not exceeding 15 working days in duration.

Clause 5.12.2.2:

No extension of time will be granted in respect of any delays attributed to normal climatic conditions. Normal climatic conditions shall be deemed to include normal rainfall and associated wet conditions and materials, strong winds and extremes of temperature. However, in the event that delays to critical activities exceed the number of working days listed below for each month, then abnormal climatic conditions shall be deemed to exist, and an extension of time may be claimed in accordance with the provisions of Clause 5.12.

The number of days quoted below shall be regarded as a fair estimate of the delays to be anticipated and allowed for under normal climatic conditions where inclement weather prevents or disrupts critical work.

January	2 days
February	2 days
March	2 days
April	2 days
May	2 days
June	4 days

July	4 days
August	4 days
September	4 days
October	2 days
November	2 days
December	2 days

Claims for delays for abnormal climatic conditions shall be accompanied by substantiating facts and evidence, which shall be submitted timeously as each day or half-day delay is experienced.

It shall be further noted that where the critical path is not affected, no extension of time for abnormal climatic conditions or for any other reason will be entertained.

Clause 5.13.1:

The penalty for failing to complete the Works is **R10 000** per calendar day.

Clause 5.16.3:

The latent defects period is **2** years

Clause 6.2.1:

The security to be provided by the Contractor shall be a performance guarantee of **0%** of the Contract Sum.

Clause 6.2.2:

Delete Clause 6.2.2 in its entirety.

Clause 6.2.3:

Delete Clause 6.2.3 in its entirety and replace with the following:

The Contractor shall ensure that the performance guarantee remains valid and enforceable until the Certificate of Completion of the Works is issued.

Clause 6.5.1.2.3:

The percentage allowance to cover overhead charges is **10%**

Clause 6.8.2:

Add the following to Clause 6.8.2:

The Contract Price shall **not** be subject to any contract price adjustment and the rates and prices tendered in the bill of quantities shall be final and binding throughout the period of the Contract.

Notwithstanding the above, if special materials are specified in Part 2 of the Contract Data then the provisions of Clause 6.8.3 of the General Conditions of Contract shall apply to such special materials.

Furthermore if, as a result of any extension of time granted, the duration of the contract period exceeds one year, the contract will automatically be subject to contract price adjustment for that period by which the extended contract period exceeds such one year.

Where applicable, in terms of the foregoing, the value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule with the following values:

The value of "x" is 0,15.

The values of the coefficients are:

a = 0,20 b = 0,25 c = 0,50 d = 0,05

The base month is the fourth month after the Commencement Date of the Contract.

In addition, the Contract Price Adjustment Schedule shall be amended as follows:

"L" is the "Labour Index" and shall be the Consumer Price Index (CPI per Province) for the National Province wherein the larger part of the Site is located, as published in the Statistical News Release, P0141 Table A of Statistics South Africa.

"P" is the "Plant Index" and shall be the Producer Price Index for Civil engineering plant as published in the Statistical News Release P0142.1, Table 12 of Statistics South Africa.

"M" is the "Materials Index" and shall be the Producer Price Index for materials for Building and construction – Civil engineering as published in the Statistical News Release P0142.1, Table 11 of Statistics South Africa.

"F" is the "Fuel Index" and shall be the Producer Price Index for Diesel at wholesale level – Coast as published in the Statistical News Release P0142.1, Table 12 of Statistics South Africa.

Clause 6.8.4:

Add the following to Clause 6.8.4:

Notwithstanding the above, in the event that a public holiday is proclaimed after 28 days before the closing date for tenders, no costs other than those that can be claimed under Clause 5.12.3 shall be added to the contract price.

Clause 6.10.1.5:

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

Clause 6.10.3:

Add the following to Clause 6.10.3:

Interim payments to the Contractors shall be subject to a retention by the Employer of an amount of **10%** of the said amounts due to the Contractor, with no limit. A guarantee in lieu of retention is not permitted. Retention payment shall be released, where applicable, in two stages, namely 50% at Practical Completion and 50% at the end of the defect's liability period.

Clause 6.10.4:

Add the following to clause 6.10.4:

Furthermore, payment shall be subject to the Employer being in possession of an original valid tax clearance certificate at the time payment is due (it is the responsibility of the Contractor to submit an updated original tax clearance certificate to the Supplier Management Office should any current certificate expire during the contract period).

Notwithstanding anything above, the Engineer shall be empowered to withhold the delivery of the payment certificate until the Contractor has complied with his obligations to report in terms of Clause 4.10.2 and as described in the Scope of Work.

Clause 8.6.1.1.2:

The value of Plant and materials supplied by the Employer to be included in the insurance sum is **R 0.00 (Nil)**.

Clause 8.6.1.1.3:

The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is **R0.00 (Nil)**.

Clause 8.6.1.3:

The limit of indemnity for liability insurance is R20 000 000.00 for any single claim – the number of claims to be unlimited during the construction and defects liability periods.

Clause 8.6.1.5:

In addition to the insurances required in terms of General Conditions of Contract Clauses 8.6.1.1 to 8.6.1.4 the following insurance is also required:

- (a) Insurance of Construction Equipment (including tools, offices and other temporary structures and contents) and other things (except those intended for incorporation into the Works) brought onto the site for a sum sufficient to provide for their replacement.
- (b) Insurance in terms of the provisions of the Compensation for Occupational injuries and Diseases Act No. 130 of 1993.
- (c) Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger Liability Indemnity.
- (d) Where the contract involves manufacturing and/or fabrication of the works or part thereof at premises other than the Site, the Contractor shall satisfy the Employer that all materials and equipment for incorporation in the works are adequately insured during manufacture and/or fabrication. In the event of the Employer having an insurable interest in such works during manufacture or fabrication then such interest shall be noted by endorsement to the Contractor's Policies of Insurance.

Clause 9.2.1:

Add the following to Clauses after Clause 9.2.1.3.7:

- 9.2.1.3.8 The Contractor committed a corrupt or fraudulent act during the procurement process or the execution of the contract.
- 9.2.1.3.9 An official or other role player committed any corrupt or fraudulent act during the procurement process or in the execution of the contract that benefited the Contractor.

Clause 10.5.3:

The number of ad-hoc Adjudication Board Members to be appointed is 1(one).

ADDITIONAL CONDITIONS OF CONTRACT

Add the following clause after clause 10

Clause 11: Details to be confidential

The Contractor shall treat the details of the Works comprised in this Contract as private and confidential (save in so far as may be necessary for the purposes hereof) and shall not publish or disclose the same or any particulars thereof in any trade or technical paper elsewhere without the prior written consent of the Engineer.

Part 2: Data provided by the Contractor

Clause 1.1.1.9:

The name of the Contractor is

Clause 1.2.1.2:

The address of the Contractor is

Physical : Address	.....	Postal : Address	.....

Telephone :	.....	Fax:	.....
email :	.....	

Clause 6.8.3: Variation in the cost of special materials

See schedule attached on next page.

SPECIAL MATERIALS			
Each material dealt with as a special material in terms of Clause 4.1 of the Contract Price Adjustment Schedule of the General Conditions of Contract is stated in the list below. The provisions of Clause 6.8.3 of the General Conditions of Contract shall apply to such special materials. The base rates and prices for the special materials (current at the time of tender) shall be as stated in the schedule below, or where required, shall furnished by the tenderer. Rates or prices furnished by the tenderer shall not include VAT but shall include all other obligatory taxes and levies). Only those materials listed by the Employer below shall be considered as special materials.			
Special Material	Unit	Polymer based Products:	Current Rate or Price
HDPE Geomembrane			
None-Woven Geotextiles			
Woven Geotextiles			
Geosynthetic Clay Liners			
		N/A	
		N/A	
		N/A	
		N/A	

Notes:

- When called upon to do so, the tenderer/contractor shall substantiate rates or prices furnished at the time of tender, or during the execution of the contract, with acceptable documentary evidence.
- In the case of bituminous products, the tenderer shall state, in the schedule above, the source of the bitumen upon which the tendered rates are based.
- Extra over rates to cover the cost of transporting bitumen from beyond the borders of the Western Cape Province have been measured separately in the Bills of Quantities.

SIGNED ON BEHALF OF TENDERER:

Note: Tenderers should not add any Special Materials to this list. They may qualify their tenders should they believe any material which will be used in the Contract constitutes a Special material.

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

C1.4 Occupational Health and Safety Agreement

(To be completed and signed by all Mandataries)

OCCUPATIONAL HEALTH AND SAFETY ACT NO 85 OF 1993

Note: Section 1(1)(xxviii) of the Act defines a “mandatary” as including “an agent, a contractor or a subcontractor for work”

Agreement made and entered into between **Cape Winelands District Municipality** and (mandatary).

..... as envisaged
by the provisions of Section 37(2) of the Occupational Health and Safety Act 1993 as amended.

I, representing
(mandatary) do hereby
acknowledge that (mandatary)

is an employer in its own right with duties as prescribed in the Occupational Health and Safety Act 1993 as amended and agree to ensure that all contractual work will be performed and that all machinery and plant will be used in accordance with the provisions of the said Act. In conclusion, I do hereby indemnify the **Cape Winelands District Municipality** against any claim of whatever nature that may arise as a result of any injury sustained by or any act of omission or negligence by any employee of (mandatary) :

.....

SIGNEDon the.....day of.....20.....

WITNESS:

.....
for and on behalf of the Mandatary

WITNESS:

.....
for and on behalf of Cape Winelands District Municipality

OCCUPATIONAL HEALTH AND SAFETY CONDITIONS

1. The Chief Executive Officer of the Contractor shall assume the responsibility in terms of Section 16(1) of the Occupational Health and Safety Act (as amended). Should the Contractor assign any duty in terms of Section 16(2), a copy of such assignment shall immediately be provided to the representative of the Employer as defined in the Contract.
2. All work performed on the Employer's premises shall be performed under the supervision of the construction supervisor who understand the hazards associated with any work that the Contractor performs on the site in terms of Construction Regulations 2014.
3. The Contractor shall appoint a Competent Person who shall be trained on any occupational health and safety aspect pertaining to them or to the work that is to be performed.
4. The Contractor shall ensure that he familiarises himself with the requirements of the Occupational Health and Safety Act and that he, his employees, and any sub-contractors, comply with them.
5. Discipline in the interests of occupational health and safety shall be strictly enforced.
6. Personal protective equipment shall be issued by the Contractor as required and shall be worn at all times where necessary.
7. Written safe work procedures and appropriate precautionary measures shall be available and enforced, and all employees shall be made conversant with the contents of these practices.
8. No substandard equipment/machinery/articles or substances shall be used on the site.
9. All incidents referred to in terms of Section 24 of the Occupational Health and Safety Act shall be reported by the Contractor to the Department of Labour and the Employer.
10. The Employer hereby obtains an interest in the issue of any formal inquiry conducted in terms of Section 32 of the Occupational Health and Safety Act and into any incident involving a Contractor and/or his employees and/or his sub-contractor/s.
11. No use shall be made of any of the Employer's machinery/plant/equipment/substance/personal protective equipment or any other article without prior arrangement and written approval.
12. No alcohol or any other intoxicating substance shall be allowed on the site. Any person suspected of being under the influence of alcohol or any other intoxicating substance shall not be permitted access to, or allowed to remain on the site.
13. Prior to commencement of any work, verified copies of all documents mentioned in the agreement, must be presented to the Employer.

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

C1.5 Enterprise Development Participation Goals

The Contractor shall, in the performance of the contract, achieve the Contract Participation Goals (CPG) relating to the engagement of targeted enterprises as established in the Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts, as published in Gazette Notice No. 36190 of 25 February 2013, hereinafter called "the Standard".

Part C2: Pricing Data

	Pages
C2.1 Pricing Assumptions.....	81-82
C2.2 Bills of Quantities.....	84-110

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

C2.1 Pricing Assumptions

Pricing Assumptions mean the criteria as set out below, read together with all Parts of this contract document, which it will be assumed in the contract, that the tenderer has taken into account when developing his prices.

1. The method of measurement published by the South African Bureau of Standards in clause 8 of the Standardised Specifications for Civil Engineering Construction is applicable, subject to the variations and amendments contained in the section "Applicable SABS 1200 standardised specifications".
2. Descriptions in the Bills of Quantities are abbreviated and comply generally with those in the Standardised Specifications. Clause 8 of each Standardised Specification, read together with the relevant clauses of the Scope of Work, set out what ancillary or associated activities are included in the rates for the operations specified. Should any requirements of the measurement and payment clause of the applicable Standardised Specification, or the Scope of Work, conflict with the terms of the Schedule, the requirements of the Standardised Specification or Scope of Work, as applicable, shall prevail.
3. The clauses in a specification in which further information regarding the schedule item appears under "Reference clause" in the Schedule. The reference clauses indicated are not necessarily the only sources of information in respect of scheduled items. Further information and specifications may be found elsewhere in the contract documents. Standardised Specifications are identified by the letter or letters which follow SABS in the SABS 1200 series of specifications, e.g. G for SABS 1200 G.
4. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.
5. The quantities set out in the Bills of Quantities are the estimated quantities of the Contract Works, but the Contractor will be required to undertake whatever quantities may be directed by the Engineer from time to time. The Contract Price for the completed contract shall be computed from the actual quantities of work done, valued at the relevant unit rates and prices.
6. The prices and rates to be inserted in the Bills of Quantities are to be the full inclusive prices for the work described under the several items. Such prices and rates shall cover all costs and expenses that may be required in and for the execution of the work described, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based, as well as overhead charges and profit. Reasonable prices shall be inserted as these will be used as a basis for assessment of payment for additional work that may have to be carried out. If a nil rate is entered against an item, it will be considered that there is no charge for that particular item (even should the quantity subsequently increase).
7. A price or rate is to be entered against each item in the Bills of Quantities, whether the quantities are stated or not. An item against which no price is entered will be considered to be covered by the other prices or rates in the Bills of Quantities, and that there is no charge for that particular item (even should the quantity subsequently increase).
8. Except where rates only are required, insert all amounts to be included in the total tendered price in the "Amount" column and show the corresponding total tendered price.
9. All transportation of material anywhere on/off or from or to the various sites will be deemed to be unlimited free-haul and the contractor must allow for this in the rates tendered for the items in the Bill of Quantities.

10. The units of measurement described in the Bills of Quantities are metric units. Abbreviations which may be used in these Bills of Quantities are as follows:

mm	=	millimetre	h	=	hour
m	=	metre	kg	=	kilogram
km	=	kilometre	t	=	ton (1000 kg)
m ²	=	square metre	No.	=	number
m ² .pass	=	square metre-pass	sum	=	lump sum
ha	=	hectare	MN	=	meganeutron
m ³	=	cubic metre	MN.m	=	meganeutron-metre
m ³ .km	=	cubic metre-kilometre	P C sum	=	Prime Cost sum
l	=	litre	Prov sum	=	Provisional sum
kl	=	kilolitre	%	=	per cent
MPa	=	megapascal	kW	=	kilowatt

11. Reasonable compensation will be received where no pay item appears in the Bill of Quantities in respect of work required in terms of the Contract and which is not covered in any other pay item.
12. The Employer shall determine the amount to be paid for the Contract Participation Goal (CPG) on the contract and this amount shall be stated under the section Enterprise Development as a **Provisional Sum** in the Preliminaries and General (P & G) section. This item will not be a determinant in the competitiveness of the bid.

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWD

C2.2 Bills of Quantities

CONTENTS

SECTION 1: PRELIMINARY AND GENERAL

SECTION 2: CELL 1

SECTION 3: CONTAMINATED WATER DAM

SECTION 4: LEACHATE DAM

SECTION 5: STORMWATER DRAINS

SECTION 6: ROADS

SECTION 7: FENCING

SECTION 8: OFFICES

SECTION 9: WORKSHOP

SECTION 10: SERVICES

SECTION 11: MISCELLANEOUS

SUMMARY

DECLARATION

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 1 : PRELIMINARY AND GENERAL

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1.1	SANS 1200 A	<u>GENERAL</u>				
		<u>Fixed Charge and Value Related Items</u>				
1.1.1	8.3.1	<u>Contractual Requirements, Sureties and Insurance</u>	Sum			
1.1.2	8.3.2	<u>Establishment of Facilities on the Site</u>				
1.1.3	8.3.2.1	FACILITIES FOR ENGINEER				
		a) Furnished offices (1 No 8m ²)	Sum			
		b) Provision for power	Sum			
		c) Nameboard x 1	Sum			
1.1.4	8.3.2.2	FACILITIES FOR CONTRACTOR				
		a) Offices, stores, workshops	Sum			
		b) Tools and equipment	Sum			
		c) Toilets and ablutions	Sum			
		d) Temporary fencing off site of construction camp	Sum			
		e) Provision of water, power and communication	Sum			
		f) Refuse containers and disposal	Sum			
		g) Dealing with water	Sum			
1.1.5	8.3.3	OTHER FIXED CHARGE OBLIGATIONS				
		a) Setting out	Sum			
		b) Security	Sum			
		c) As built survey	Sum			
		d) Obligations in respect of Health and Safety Act	Sum			
		e) Fixed P&G for lining Contractor	Sum			
1.1.6	8.3.4	<u>Removal of site establishment</u>	Sum			
1.2	8.4.2	<u>Scheduled Time Related Items</u>				
1.2.1	8.4.1	<u>Contractual Requirements, Sureties and Insurance</u>	Month	10		
1.2.2	8.4.2	<u>Operation and Maintenance of Facilities on Site</u>				
1.2.3	8.4.2.1	FACILITIES FOR ENGINEER				
		a) Furnished offices (1 No 8m ²)	Month	10		
		b) Provision for power	Month	10		
1.2.4	8.4.2.2	FACILITIES FOR THE CONTRACTOR				
		a) Offices, stores, workshops	Month	10		
		b) Tools and equipment	Month	10		
		c) Toilets and ablutions	Month	10		
		d) Temporary fencing off site of construction camp	Month	10		
		e) Provision of water, power and communication	Month	10		
		f) Refuse containers and disposal	Month	10		
		g) Dealing with water	Month	10		
TOTAL CARRIED FORWARD						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
1.2.5	8.4.5	<u>Other Time Related Obligations</u>				
		a) Setting out	Month	10		
		b) Security	Month	10		
		c) Surveys	Month	10		
		d) Lining Contractor	Month	5		
		e) Obligations in respect with Health and Safety	Month	10		
		f) Obligations i.t.o. licence conditions	Month	10		
1.2.6	8.4.3	<u>Supervision for duration of construction</u>	Month	10		
1.2.7	8.4.4	Company & Head Office Overhead Costs	Month	10		
1.3	8.5	<u>Sums Stated Provisionally by Engineer</u>				
1.3.1		<u>Acceptance Testing</u>				
	8.5 b) 1)	a) Carry out acceptance testing (as required by	P/Sum	1	R 150 000.00	R 150 000.00
	8.5 b) 2)	b) Overheads, charges and profit on item above	%	10		R 15 000.00
1.3.2		<u>Enterprise Development</u>				
	Gazette Notice No. 36190 of 25 February 2013	a) Needs analysis, Monitoring and Reporting per Targeted Enterprise	P/Sum	1	R 140 000.00	R 140 000.00
		Enterprise Development Co-ordinator	P/Sum	1	R 120 000.00	R 120 000.00
		Overheads, charges and profit on item above	%	10		R 12 000.00
1.3.3		<u>Community</u>				
	8.5 b) 1)	Community Liaison Officer	Prov Sum	1	R 100 000.00	R 100 000.00
	8.5 b) 2)	Overheads, charges and profit on item above	%	10		R 10 000.00
1.3.4		<u>Electronic Leak location testing</u>				
	PS 30	a) Carry out Independent Electronic leak location testing on exposed geomembrane liner system in accordance with ASTM D7953 - 14 "Arc testing"	Prov Sum	1	R 90 000.00	R 90 000.00
	PS 31	b) Carry out Independent Electronic leak location testing	Prov Sum	1	R 770 000.00	R 770 000.00
		c) Overheads, charges and profit on item above	%	10.00		R 86 000.00
1.4	SANS 1200 A	<u>DAYWORKS AND PLANT HIRE.</u>				
1.4.1	8.7	<u>Dayworks:</u>				
		<u>a) Normal Time:</u>				
		(I) Supervisor	hr	Rate only		
		(II) Artisan	hr	Rate only		
		(III) Operator	hr	Rate only		
		(IV) Labourer	hr	Rate only		
1.4.2		<u>b) Plant</u>				
		(I) Loader 150kW	hr	Rate only		
		(II) Grader 130 kW	hr	Rate only		
		(III) Vibrating roller 12t	hr	Rate only		
		(IV) Water cart 10000l	hr	Rate only		
		(V) Tip truck 10 m3 capacity	hr	Rate only		
		(VI) Excavator 20t	hr	Rate only		
		(VII) Bull Dozer <160 kW	hr	Rate only		
		(VIII) TLB 73 kW	hr	Rate only		
		(IX) Lightweight tracked Bobcat or similar <70 kW	hr	Rate only		
TOTAL CARRIED TO SUMMARY						

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 2 : PHASE 1 LANDFILL CELL

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
2.1	SANS 1200 C	CLEARING				
2.1.1	8.2.1	Clear and Grub				
		Clear Site incl. remove trees up to 1m girth on site to approved approved temporary stockpile on Site	m ²	120 460		
2.2	SANS 1200 D	EARTHWORKS				
2.2.1	8.3.1.2	Remove topsoil to nominal depth 150 mm, stockpile, and maintain	m ²	120 460		
2.2.2	8.3.2	<u>Bulk Excavation</u>				
		Excavate in all materials and use for embankments or backfill or dispose, as ordered by engineer.				
		i) Place in embankment where applicable (incl. edge control and separation berm) and compact in 150mm layers to 95% modified AASHTO maximum density	m ³	14 999		
		ii) Cut to Stockpile	m ³	197 983		
2.2.3	8.3.2b)	Extra over for excavation in:				
		2) Hard excavation	m ³	rate only		
2.2.4	8.3.3	<u>Restricted Excavation</u>				
		a) Excavate in all materials where applicable for trenches, backfill and compact to 93% MoD AASHTO and dispose of surplus material depth : (0.0m -1.0m)				
	PS 02	i) Edge berm anchor trench (600mm x 500mm) for GCL, HDPE geomembrane and geotextile (backfill with selected material & stabilise with 10% by density OPC - cement to be included in rate)	m ³	432		
	PS 02	ii) Cell separation berm anchor trench (600mm x 500mm) for GCL, HDPE geomembrane and geotextile (backfill with selected material & stabilise with 10% by density OPC - cement to be included in rate)	m ³	140		
		iii) Cell base sumps - place in stockpile	m ³	42		
		iv) V-drains for leachate collection pipe in cell base - place in stockpile	m ³	232		
	PS 02	v) Cell base and side slope trenches for leak detection riser pipe (backfilled with 10% by density OPC sand).	m ³	20		
		vi) Berm crest trenches 800mm wide for leachate pipe and backfill in layers n.e 200mm to 93% Mod AASHTO	m ³	760		
2.2.5	8.3.4	<u>Importing from commercial sources or borrow pits</u>				
		<u>Extra over items 8.3.1 & 8.3.2 above:</u>				
		a) Import G7 quality material place in layers 150mm thick and compact to 93% modified AASHTO maximum density for cell separation and control berms.	m ³	rate only		
		b) Import 150mm thick layer G7 quality material place and compact to min 93% modified AASHTO maximum density as a base preparation layer.	m ³	rate only		
2.2.6	8.3.10	<u>Topsoiling</u>				
		Take from stockpiles and place 100mm thick layer on outer embankments of landfill	m ²	720		
2.3	SANS 1200 DM	EARTHWORKS (SUBGRADE)				
2.3.1	8.3.3	<u>Treatment of subgrade</u>				
		a) 150mm in-situ subgrade preparation and compaction of materials				
	8.3.3a.2 PS 11	i) Minimum of 93% modified AASHTO maximum density including ripping,watering,shaping and compaction of in-situ materials in the cell as shown on drawings.	m ²	105 704		
TOTAL CARRIED FORWARD						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
2.3.2	8.3.3	<u>Selected Layers from Commercial Sources</u>				
	PS 03	a) Import and place >38mm washed stone aggregate for leachate collection layer,				
		i) Landfill side slopes, 150mm thick	m ³	2 212		
		ii) Landfill base, 150mm thick	m ³	13 643		
		iii) Leakage detection sumps	m ³	42		
2.3.3	8.3.3	<u>Selected Fill Layers from stockpile.</u>				
	PS 25	i) Selected soil layer 500mm thick as protection layer to top of berm, placed in layers of max. 150mm thick, nominally compacted	m ³	4 250		
		ii) Selected layers placed in Ramp on top of liner layerworks in layers not exceeding 150mm compacted to 93% Mod AASHTO	m ³	2 520		
2.4	SANS 1200 DK	GABIONS AND PITCHING				
	8.2.4	<u>Geotextile (or other geosynthetic materials)</u>				
	SANS10409	Landfill Base				
2.4.1	8.2.4 SABS1200DK & PS 04	Supply and install 3.7kg/m ² Geosynthetic Clay Liner in accordance with GRI-GCL 3 specifications	m ²	90 955		
2.4.2	SANS 10409 PS 05	Supply and install 1.5mm H.D.P.E smooth geomembrane GRI-GM13 liner.	m ²	89 583		
2.4.3	8.2.4 SABS1200DK-PS 06	Supply and installation of non woven, Needle punched geotextile, Nominal mass 1000g/m ² - as liner protection below leachate collection layer	m ²	90 955		
2.4.4	8.2.4 SABS1200DK-PS 06	Supply and installation of Non Woven, Needle punched geotextile, Nominal mass 1000g/m ² - as liner protection over sumps: 9m x 7m, and over LD riser pipes 12m x 3m.	m ²	200		
2.4.5	8.2.4 SABS1200DK & PS 08	Supply and installation of Woven geotextile with a Nominal mass 200g/m ² - as separation/drainage layer above leachate collection layer.	m ²	90 955		
2.4.6	8.2.4 SABS1200DK & PS 07	Supply and installation of Non Woven, Needle punched geotextile, Nominal mass 200g/m ² - As separation layer for the leak detection drain & sumps	m ²	3032.4		
2.4.7	8.2.4 SABS1200DK & PS 07	Supply and installation of a geotextile as separation layer under Ramp - Needle punched non woven geotextile, Nominal mass 200g/m ² .	m ²	1500		
		Side Slopes				
2.4.8	8.2.4 SABS1200DK & PS 04	Supply and install 3.7kg/m ² Geosynthetic Clay Liner in accordance with GRI-GCL 3 specifications	m ²	18 132		
2.4.9	SANS 10409 PS 05	Supply and install 1.5mm H.D.P.E double side texture geomembrane GRI-GM13 liner, coarser texture facing down.	m ²	20 394		
2.4.10	8.2.4 SABS1200DK-PS 06	Supply and installation of non woven, Needle punched geotextile, Nominal mass 1000g/m ² - as liner protection below leachate collection layer	m ²	18 132		
2.4.11	8.2.4 SABS1200DK & PS 08	Supply and installation of Woven geotextile with a Nominal mass 200g/m ² - as separation/drainage layer above leachate collection layer.	m ²	18 132		
2.4.12	SANS 10409 PS 05	E.O ordinary 1.5mm H.D.P.E pre-fabricated geomembrane for 250mm (Φ) diameter boot seal.	no	2		
2.5	SANS 1200 LB	BEDDING (PIPES)				
2.5.1	8.2.2	<u>Supply only of bedding by importation:</u>				
	8.2.2.3	From commercial sources:				
	PSDB8.3.8	a) Import and place 19mm crushed stone as filter stone around 110mm diameter (Φ) double walled corrugated HDPE pipe leachate leak detection pipe, stone layer 200mm thick	m ³	211		
	PSD1.1	b) 100mm thick washed River Sand backfill layer to leakage detection finger drains.	m ³	77		
2.6	SANS 1200 LD	PIPE WORK				
	8.2.1	<u>Supply, lay and bed complete with couplings:</u>				
2.6.1	8.2.1 PS 13	Supply and install 160mm diameter (Φ) double walled corrugated HDPE pipe with slotted perforations and ring stiffness > 450 kPa - in the leachate collection layer.incl all coupling, bends etc.	m	3 101		
2.6.2	8.2.1 PS 14	Supply and install 110mm diameter (Φ) double walled corrugated HDPE pipe with slotted perforations and ring stiffness > 450 kPa - in the leachate collection layer.incl all couplings, bends etc.	m	3 101		
TOTAL CARRIED FORWARD						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
2.6.3	8.2.1	Supply and install 200mm diameter (Φ) PE 100, PN 12.5 HDPE leachate collection pipe on berm crest and from leachate collection manholes to leachate dam, incl all fittings details to collection manholes and leachate collection dam as shown on drawings.	m	871		
2.6.4	8.2.1 PS 12	Supply and installation of 250mm diameter (Φ) PE100 PN 10 HDPE riser pipes for leachate collection incl all fittings details, to berm crest manholes as shown on drawings.	m	37		
2.6.5	8.2.1 PS 12	Supply and installation of 250mm diameter (Φ) PE 100 PN 10 HDPE riser pipes for leakage detection incl all fittings details to berm crest manhole as shown on drawings.	m	37		
2.7	SANS 1200 LE	STORMWATER DRAINAGE				
	8.2.8 PS 15	Pre-fabricated HDPE manholes 1200mm diameter (Φ), wall thickness of 20mm including base end cap, extrude welded, complete with HDPE step irons and removable cover and frame for leachate leak detection and collection, depths:				
2.7.1		0m to 1.5m	No.	14		
2.7.2		1.5m to 2.0m	No.	2		
2.7.3		2.0m to 2.5m	No.	0		
2.7.4		≥ 2.5m	No.	0		
2.7.5	PS16	1.5x 1.5m concrete footing for manhole, 200 thk 25 Mpa with 1 layer ref mesh 193	No.	16		
TOTAL CARRIED TO SUMMARY						

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 3 : CONTAMINATED WATER DAM

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
3.1	SANS 1200 C	CLEARING				
3.1.1	8.2.1	Clear and Grub Clear Site incl. remove trees up to 1m girth on site to approved approved temporary stockpile on Site	m ²	5 110		
3.2	SANS1200 D	EARTHWORKS				
3.2.1	8.3.1.2	Remove topsoil to nominal depth 150 mm, stockpile, and maintain	m ²	rate only		
3.2.2	8.3.2	<u>Bulk Excavation</u> Excavate in all materials and use for compacted fill of contaminated water dam or stockpile, as ordered by engineer. i) Place in dam where applicable and compact in 150mm layers to 93% modified AASHTO maximum density ii) Cut to Stockpile	m ³ m ³	958 4 190		
3.2.3	8.3.2b)	<u>Extra over for excavation in:</u> 2) Hard excavaton	m ³	rate only		
3.2.4	8.3.3	<u>Restricted Excavation</u> a) Excavate in all materials where applicable for trenches, backfill and compact to 98% MoD AASHTO and stockpile of surplus material depth : (0.0m -1.0m)				
	PS 02	i) Edge berm anchor trench (500mm x 700mm) for GCL, HDPE geomembrane, geotextile & woven concrete filled lattice layer. b) Excavate in all materials and stockpile	m ³	103		
		i) Leachate Dam spillway to Contaminated Dam	m ³	70		
3.3	SANS1200 DM	EARTHWORKS (SUBGRADE)				
3.3.1	8.3.3	<u>Treatment of subgrade</u> a) 150mm in-situ subgrade preparation and compaction of materials to				
	8.3.3a.2 PS 11	i) Minimum of 93% modified AASHTO maximum density including ripping,watering,shaping and compaction of in-situ materials in the dam as shown on drawings.	m ²	4 260		
3.4	SANS 1200 DK	GABIONS AND PITCHING				
		<u>Geotextile (or other geosynthetics) on base and slope</u>				
3.4.1	8.2.4 SABS 1200DK & PS04	Supply and install 3.7kg/m ² Geosynthetic Clay Liner in accordane with GRI-GCL 3 specifications	m ²	4 586		
3.4.2	SANS 10409 & PS05	Supply and install 1,5mm H.D.P.E smooth geomembrane GRI-GM13 liner.	m ²	4780		
3.4.3		E.O 1,5mm H.D.P.E geomembrane for gas vents at 10m centres, as per drawing detail	No.	26		
3.4.4	8.2.4 SABS 1200DK & PS06	Supply and installation of non woven, Needle punched geotextile, Nominal mass 1000g/m2 - as liner protection below concrete filled woven tape & sump protection.	m ²	4 586		
3.4.5	8.2.4 SABS 1200DK & PS09	Supply and installation of 100mm thick woven tape cellular lattice structure geotextile filled with 5 Mpa concrete. Concrete to be included in rate.	m ²	4586		
3.5	SANS 1200 DK and 1200 G	EMERGENCY OVERFLOW				
3.5.1	PS 17	Construct emergency overflow comprising of excavating, shaping and compacting, casting 100mm thick 25Mpa concrete, 1 layer ref mesh 193 and concrete expansion joints every linear 4 meters up to head wall of culvert per draing ES-754-2022-029-A	L/Sum	1		
TOTAL CARRIED TO SUMMARY						

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 4 : LEACHATE CONTAINMENT

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
4.1	SANS 1200 C	CLEARING				
4.1.1	8.2.1	Clear and Grub Clear Site incl. remove trees up to 1m girth on site to approved approved temporary stockpile on Site	m ²	7 650		
4.2	SANS 1200 D	EARTHWORKS				
4.2.1	8.3.1.2	Remove topsoil to nominal depth 150 mm, stockpile, and maintain	m ²	rate only		
4.2.2	8.3.2	<u>Bulk Excavation</u> Excavate in all materials and use for compacted fill of leachate dam or dispose, as ordered by engineer. i) Place in leachate dam where applicable and compact in 150mm layers to 93% modified AASHTO maximum density ii) Cut to Stockpile	m ³ m ³	1 430 12 113		
4.2.3	8.3.2b)	<u>Extra over for excavation in:</u> 2) Hard excavaton	m ³	rate only		
4.2.4	8.3.3	<u>Restricted Excavation</u> a) Excavate in all materials where applicable for trenches, backfill and compact to 98% MoD AASHTO and dispose of surplus material depth : (0.0m -1.0m) i) Edge berm anchor trench (500mm x 700mm) for GCL, HDPE geomembrane, geotextile and woven concrete filled lattice layer ii) Ditto for Sump riser pipes trenches b) Excavate in all materials and stockpile i) Leachate dam base sumps ii) Leachate dam sub-soil pipes trenches (backfill 100mm coarse sand) iii) Leachate Dam spillway to Contaminated Dam	m ³ m ³ m ³ m ³ m ³ m ³	139 20 21 33 117		
4.3	SANS 1200 DM	EARTHWORKS (SUBGRADE)				
4.3.1	8.3.3	<u>Treatment of subgrade</u> a) 150mm in-situ subgrade preparation and compaction of materials to				
	8.3.3a.2 PS 11	i) Minimum of 93% modified AASHTO maximum density including ripping, watering, shaping and compaction of in-situ materials in the cell as shown on drawings.	m ²	6 685		
4.4	SANS 1200 DK	GABIONS AND PITCHING				
	8.2.4	Geotextile (or other geosynthetics) on base and slope				
4.4.1	SANS 10409 & PS05	Supply and install 1.5mm H.D.P.E smooth geomembrane GRI-GM13 liner.	m ²	7 703		
4.4.2	8.2.4 SABS 1200DK, PS04	Supply and install 3.7kg/m ² Geosynthetic Clay Liner in accordance with GRI-GCL 3 specifications	m ²	7 459		
4.4.3	PS 10	Supply and install Single sided HDPE Cuspated Drain with a minimum core height of 7mm under load with heat bonded geotextile to prevent intrusion into drainage cores	m ²	7 459		
4.4.4	SANS 10409 & PS05	Supply and install 2mm H.D.P.E smooth geomembrane GRI-GM13 liner.	m ²	7 703		
4.4.5	SANS 10409	E.O ordinary 2mm H.D.P.E geomembrane for 250mm (Φ) diameter boot seals.	no	2		
4.4.7	SANS 10409	E.O ordinary 1.5mm H.D.P.E geomembrane for 250mm (Φ) diameter boot seals.	no	1		
4.4.8		E.O ordinary 2mm H.D.P.E geomembrane for gas vents at 10m centres, as per drawing detail	no	31		
TOTAL CARRIED FORWARD						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
4.4.9	8.2.4 SABS 1200DK, PS06	Supply and installation of non woven, Needle punched geotextile, Nominal mass 1000g/m ² - as liner protection below Concrete filled woven tape lattice layer, Riser pipes & drainage sumps.	m ²	7 459		
4.4.10	8.2.4 SABS 1200DK, PS09	Supply and installation of 100mm thick woven tape cellular lattice structure geotextile filled with 5 Mpa concrete. Concrete to be included in rate.	m ²	7 459		
4.5	SANS 1200 LB	BEDDING (PIPES)				
4.5.1	8.2.2	<u>Supply only of bedding by importation:</u>				
	8.2.2.3	From commercial sources:				
	PSDB8.3.8	a) Import and place 19mm washed stone aggregate for leachate leak detection				
		i) Sub-soil finger drains	m ³	24		
	PS 03	b) Import and place 38mm washed stone aggregate				
		i) Sub-soil collection Sump.	m ³	11		
		ii) Leakage Detection Sump.	m ³	10		
		c) Import and place washed coarse River Sand backfill				
	PSD1.1	i) Sub-soil finger drains	m ³	8		
4.6	SANS 1200 L	PIPE WORK:				
	8.2.1	<u>Supply, lay and bed complete with couplings:</u>				
4.6.1	8.2.1 PS 12	Supply and installation of 250mm diameter (Φ) PE 100 PN 12.5 riser pipes for leakage detection incl all fittings details to leak detection monitoring manhole as shown on drawings.	m	18		
4.6.2	8.2.1 PS 12	Supply and installation of 250mm diameter (Φ) PE 100 PN 12.5 HDPE riser pipe for sub-soil detection incl all fittings details to leak detection monitoring manhole as shown on drawings.	m	18		
4.6.3	8.2.1 PS 13	Supply and install 110mm diameter (Φ) double walled corrugated HDPE pipe with slotted perforations and ring stiffness > 450 kPa - in the leachate collection layer.incl all couplings, bends etc.	m	190		
4.7	SANS 1200 LE	STORMWATER DRAINAGE				
4.7.1	8.2.6 PS15	Pre-fabricated HDPE manholes 1200mm diameter (Φ), wall thickness of 20mm including base end cap, extrude welded, complete with HDPE step irons and removable cover and frame for sub-soil collection and leachate leak detection, depths:				
		0m to 1.5m	No.	1		
4.7.2	PS16	1,5x 1,5m concrete footing for manhole, 200 thk 25 Mpa with 1 layer ref mesh 193	No.	1		
TOTAL CARRIED TO SUMMARY						R 0.00

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 5 : STORMWATER DRAINS

ITEM NO.	REF	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
5.1	SANS 1200 C	CLEARING				
5.1.1	8.2.1	<u>Clear and Grub</u> Clear Site incl. remove trees up to 1m girth on site to approved approved temporary stockpile on Site	m²	9 700		
5.2	SANS 1200 D	EARTHWORKS				
5.2.1	8.3.1.2	Remove topsoil to nominal depth 150 mm, stockpile, and maintain	m²	1 450		
5.2.2	8.3.3	<u>Restricted Excavation:</u>				
	8.3.3a)	Excavate in all materials, trim, shape and compact to 90% Mod AASHTO for: n.e 1m deep				
		i) Un-lined clean stormwater concrete v-drain	m³	721		
		ii) Contaminated stormwater concrete v-drains	m³	2 008		
		iii) Grouted stone pitched stormwater channel	m³	101		
		iv) Pipe trench	m³	15		
5.2.3		Exc 1m n.e 2m deep				
		i) Pipe trench	m³	171		
5.2.4	8.3.4	<u>Importing of materials</u> a)Extra over items 8.3.3a) Import from commercial sources G7 fill material compacted to 93% Mod AASHTO in layers n.e 150mm thick.				
		i) Contaminated stormwater concrete v-drains	m³	885		
5.3	SANS 1200 DK	GABIONS AND PITCHING				
5.3.1	8.2.5	Stone pitching of stormwater v-drain, incl trimming, stone supply and placement, cement grouting and any form of anchorage complete.	m²	244		
5.4	SANS 1200 LB	BEDDING (PIPES)				
5.4.1	8.2.1	<u>Provision of Bedding from trench excavation</u> a) Selected granular material.				
		i) Pipe trenches	m³	101		
5.5	SANS 1200 LE	STORMWATER DRAINAGE:				
5.5.1	8.2.1, PS18	<u>Supply and lay concrete pipe culvert on class B bedding</u> (Φ)450mm diameter 100D concrete culvert pipe				
		i) crossing at T-junction	m	15		
		ii) crossing at truck sidings	m	120		
		iii) outlet from Contaminated Water Pond spillway	m	30		
5.5.2		(Φ)300mm diameter 100D concrete culvert pipes				
		i) crossing at washbay	m	30		
5.5.3	8.2.7	<u>Pre-cast headwalls and wingwalls incl apron.</u>				
		i) (Φ)450mm diameter single barrel	No	2		
		ii) (Φ)450mm diameter double barrel	No	4		
		iii) (Φ)450mm diameter triple barrel	No	2		
TOTAL CARRIED FORWARD						

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 5 : STORMWATER DRAINS

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
5.6	SANS 1200 GA	CONCRETE (SMALL WORKS)				
5.6.1		<u>FORMWORK</u>				
	8.2	<u>Scheduled Formwork Items</u>				
	8.2.2	Smooth formwork				
		a) Vertical (Both sides of outlet headwalls)	m ²	23	R 0.00	
5.6.2	8.2.3	<u>Narrow widths</u>				
		i) Not exceeding 300mm high (sides of drain surface bed)	m	4992		
		ii) Not exceeding 300mm high (sides of headwall)	m	8		
		iii) Not exceeding 300mm high (sides of apron)	m	64		
5.6.3		<u>REINFORCEMENT</u>				
	8.3.2	<u>High tensile welded mesh reinforcement</u>				
		i) Reference No 193 placed 50mm from the bottom of V-drain	m ²	5112		
		ii) Reference No 193 placed 50mm from the bottom of outlet apron	m ²	120		
		iii) Reference No 193 placed 50mm from the middle of headwall	m ²	25		
5.6.4	8.4.3	<u>Strength Concrete 25/19 Mpa</u>				
		i) V-drains panels cast in alternative lengths of 4.50m maximum	m ³	560		
		ii) Outlet structure apron	m ³	36		
		iii) Outlet structure headwalls	m ³	8		
5.6.5	8.4.4	<u>Unformed surface finishes</u>				
	(a)	i) Wood float finish on stormwater v-drains	m ²	5390		
	(a)	ii) Wood float finish on stormwater outlet apron	m ²	120		
	(b)	iii) Steel float finish to headwalls	m ²	7		
5.6.6	8.5	<u>Joints in V-drain</u>				
		10X100mm bitument impregnated softboard joints with top 10x10mm filled with high modulus polysulphide.	m	1169		
TOTAL CARRIED TO SUMMARY						

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 6 : ROADS

ITEM NO.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
6.1	SANS 1200 D	Earthworks				
6.1.1	8.3.2	<u>Restricted Excavation</u> a) Excavate in all materials where applicable for trenches, backfill and compact to 93% MoD AASHTO and dispose of surplus material depth : (0.0m -1.0m) i) Electrical / Telkom sleeve trenches.	m³	15		
6.2	SANS 1200 DM	CLEARING				
6.2.1	8.3.1	Clear Site Clear Site incl. remove trees up to 1m girth on site to approved approved temporary stockpile on Site	m²	26225		
6.2.2	8.3.2	<u>Preparation of Site</u> a) Remove topsoil to nominal depth 150 mm, stockpile, and maintain	m³	3791		
6.2.3	8.3.3	<u>Treatment of subgrade</u> 150mm in-situ subgrade preparation and compaction of materials to Minimum of 90% modified AASHTO maximum density including ripping, watering, shaping and compaction of in-situ materials.	m³	4553		
6.2.4	8.3.4	<u>Cut to Fill</u> a) Compact to 90% Mod AASHTO mdd.	m³	5201		
6.2.5	8.3.4	<u>Borrow to fill</u> a) Compact to 90% Mod AASHTO mdd.	m³	rate only		
6.2.6	8.3.5	<u>Selected layer compacted to 95% Mod AASHTO</u> Import from commercial source and place fill in 150mm layers G7 quality material compacted to 95% modified AASHTO maximum density	m³	rate only		
6.2.7	8.3.7	<u>Cut to stockpile</u> a) From soft excavation.	m³	6461		
6.3	SANS1200 MF	BASE				
6.3.1	8.3.3	<u>Construct base / gravel wearing course with material Imported from commercial sources or borrow areas.</u> Import 200mm thick layer G7 quality material place and compact to 95% modified AASHTO maximum density for gravel wearing course. Import 150mm thick layer G5 quality material place and compact to 96% modified AASHTO maximum density for gravel wearing course.	m³ m³	4719 555		
6.4	SANS1200 MJ	SEGMENTED PAVING				
6.4.1	8.2.2. PSMJ	<u>Laying of interlocking paving blocks complete with bedding sand</u> Supply and laying of 80mm heavy duty baked clay interlocking paving G-blocks type SA to suit existing - complete with 20mm bedding sand (Truck sidings)	m²	3702		
6.5	SANS1200 MK PSMK	KERBS AND CHANNELLING				
6.5.1	8.2.1 a)	i) Supply and install pre-cast concrete barrier kerb with laid straight (Fig. 3)	m	445		
	8.2.1 a)	ii) Ditto but laid to a radius	m	70		
	8.2.1 a)	iii) Supply and install concrete Fig. 13 edge beam	m	36		
TOTAL CARRIED FORWARD						

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 6 : ROADS

ITEM NO.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
6.6	SANS1200 MM PSMM	ANCILLARY ROADWORKS (LABOUR INTENSIVE)				
6.6.1	8.3.6	Supply and erect of statutory signs, street names (supplied and erected complete)				
		R1 (stop)	No.	1		
6.6.2	6.4.1	Non-Reflective Paint appliedat nominal rate of 0.42l/m2 as scheduled:				
		White paint:				
		i) Parking Bays	m	115		
		ii) Stop	No.	1		
6.7	SANS 1200 LC	TELKOM AND ELECTRICAL SERVICE DUCTS				
6.7.1		CABLE SLEEVES				
	8.2.5	Supply, lay, bed and prove duct				
		Ø160mm HDPE Kabelflex road crossing sleeve or similar approved.	m	24		
6.7.2	8.2.7	DRAWPITS/MANHOLES				
		600 x 600 Telkom manhole n.e. 0.6m deep	No.	2		
TOTAL CARRIED TO SUMMARY						

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 7 : FENCING

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
7.1	SANS 1200 C	CLEARING				
7.1.1	8.2.1	Clear and Grub				
		Clear Site incl. remove trees up to 1m girth on site to approved approved temporary stockpile on Site	m ²	4 165		
7.1.2	8.2.5	Remove and dispose of existing fences	km	Rate only		
7.2		Fencing				
7.2.1	PS19	Supply and intsa 2400mm high black PVC coated 'Clearview Wiretech' fence or similarly approved, with square posts incl. spiked top flat bar and 23 strand Electric fence 'piggy-backed' with aluminium rail on inside face, including all pvc bobbins, wiring, energiser, safety signs, 20 Mpa concrete excavation complete-to match existing fence.	m	644		
7.2.2	PS20	Supply and install 2400mm high HDG Razor diamond mesh fence 300X150mm incl. flat wrap razor coil fixed to top with 100mmDia HDG corner and strain post with 50mm stays, planted 600deep in 20Mpa concrete, 'Y' dropper standard planted n.e 4m apart, 4 x HDG strain wires etc complete.	m	2 131		
	PS21	Supply and install 1800mm high HDG diamond mesh fence with 100mmDia HDG corner and strain post with 50mm stays, planted 600deep in 20Mpa concrete, 'Y' dropper standard planted n.e 4m apart, 4 x HDG strain wires etc complete.	m	465		
7.3		ACCESS GATES				
7.3.1	PS22	Supply and install new non-motorized sliding gates as per drawing, including sliding rail concreted in-situ, stand posts and guide posts complete. To suit Fence				
		a) Heavy duty 12m wide	Sum	2		
	PS23	Supply and install new double leaf HDG access gates to suit 1800mm HDG diamond mesh fence.				
		a) 4.5m wide HDG double leaf gates	No	2		
TOTAL CARRIED TO SUMMARY						

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 8 : OFFICES

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
8.1	SANS 1200 C	CLEARING				
8.1.1	8.2.1	Clear and Grub Clear Site incl. remove trees up to 1m girth on site to approved approved temporary stockpile on Site	m ²	386		
8.2	SANS 1200D	EARTHWORKS				
8.2.1	8.3.1 a)	Remove topsoil to nominal depth 150 mm, stockpile, and maintain	m ²	386		
8.2.2		Import selected fill from stockpile and place in surface bed, compacted to 93% Mod AASHTO in layer n.e. 200mm				
		i) Surface beds	m ³	80		
		ii) Against foundation brickwork	m ³	8		
8.2.3	8.3.3	<u>Restricted Excavation</u> a) Excavate in all materials where applicable for trenches and place in stockpile. depth : (0.0m -1.0m)				
		i) Strip footings	m ³	26		
		ii) Surface bed thickenings.	m ³	2		
8.3	SANS 1200 GB	SECTION : CONCRETE (ORDINARY BUILDINGS)				
8.3.1		REINFORCEMENT				
	8.2.4c)	High-tensile welded mesh of nominal mass of:				
		i) Ref mesh 245 in strip footings.	m ²	56		
		ii) Ref mesh 193 in surface beds.	m ²	110		
8.4	SANS1200 GB	CONCRETE				
8.4.1	8.2.5.1	a) 25MPA concrete with 19 mm aggregate cast against excavated surfaces:				
		i) Strip footings	m ³	15		
		ii) Surface beds floors	m ³	10		
8.4.2	8.2.6	<u>Wood-float.</u>				
		i) Surface bed	m ²	110		
8.5	SANS1200 MJ	SEGMENTED PAVING				
8.5.1	8.2.2	<u>Laying of interlocking paving blocks complete with bedding sand</u>				
	PSMJ	Supply and laying of 60mm medium duty baked clay interlocking paving G-blocks type SA to suit existing - complete with 20mm bedding sand and concrete haunching.	m ²	95		
8.6		<u>BUILDING WORKS</u>				
8.6.1		<u>MASONRY AND PLASTERING</u>				
		<u>Brickwork in foundations (Stretcher bond)</u> Brickwork of Non-Face Plaster NFP bricks, bedded and jointed in Class I mortar. Rate includes brickforce and use of 14 Mpa bricks.				
		<u>One brick walls (230mm)</u>				
		Office building	m ²	48		
8.6.2		<u>Stock brickwork in superstructure (Stretcherbond)</u> Brickwork of Non-Face Plaster NFP bricks, bedded and jointed in Class I mortar. Rate includes brickforce, wall ties in cavity walls and use of 14 Mpa bricks.				
		<u>One brick walls (230mm)</u>				
		Office	m ²	135		
8.6.3		<u>Extra Over ordinary brickwork:</u>				
CARRIED FORWARD						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
		Face Brickwork in superstructure "Corobrik" De Hoop Red Smooth FBS clay face brick (PC sum R6500p/th), or similarly approved, bedded and jointed in Class II mortar and pointed with flush vertical and horizontal joints. Rate includes brickforce and wall ties in cavity walls.				
		One brick walls (230mm)				
8.6.4		Office	m ²	135		
		Sundries				
8.6.4.1		Extra over brickwork for face brickwork in beamfilling	m ²	10		
8.6.4.2		Extra over brickwork for raking cutting of bricks at gable ends	m	110		
8.6.4.3		Extra over brickwork for pre-cast concrete air bricks	no	9		
8.6.4.4		External brick-on edge window cills				
		Office	m	35		
8.6.4.5		Soldier course lintels				
		Office	m	35		
8.6.4.6		Brick step at building entrances complete (1.2m wide)				
		Office	No	2		
8.6.4.7		Internal brick cills				
		Office	m	35		
8.6.4.8		Prestressed fabricated lintels				
		Fabcon' 100x70 lintels				
		Office	m	55		
8.6.4.9		Galvanised hoop iron cramps, ties, etc.				
		30 x 1,6mm roof tie 1,5m long				
		Office	No	82		
8.6.4.10		Masonry joints				
		Construction joints complete with polystyrene joint filling and joint sealant	m	rate only		
8.7		Screeds on concrete				
		Floors and landings (30mm thick)				
		Office	m ²	110		
8.8		Minor Concrete				
		Shower Floors 15MPa/19mm Floors	m ³	2		
8.9		WATERPROOFING				
8.9.1		Brikgrip DPC 375 micron damp proof course or similar approved in walls				
		One Wall (230mm wide)				
		i) Walls	m	75		
		ii) Window cills	m	15		
8.9.2		USB Green 250 micron damp proof course under concrete surface beds				
		Office	m ²	105		
CARRIED FORWARD						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
8.10		<u>WINDOWS AND GLAZING</u> Rate includes glazing, painting, glazing sealant and joint sealant <u>Office building</u>				
8.10.1		<u>Swartland 'Kenzo range' Aluminium, Natural anodized standard aluminium windows - or similar approved.</u> i) NE1- PT66 (600X600mm) incl 4mm obscure glass. ii) ND4- PTT1512(1500X1200mm) incl 4mm clear float glass on opening sashes and safety glass on fixed pane. iii) ND7- PT129 (1200X900mm) incl. 4mm clear float glass.	No No No	6 6 2		
8.11		<u>DOORS AND DOOR FRAMES</u>				
8.11.1		<u>Door Frames</u> Durowin or similar approved, single-rebated hot-dip galvanised pressed steel door frame For 230mm Brick walls: i) For left hand door size 813mm x 2032mm high ii) For right hand door size 813mm x 2032mm high iii) For double doors size 1613mm x 2032 mm high	No No No	3 8 1		
8.11.2		<u>Timber Doors</u> Swartland or similar approved SD2 T&G framed and ledged solid Meranti doors with flush back panel i) Size 813mm x 2032mm high - Left Hand ii) Size 813mm x 2032mm high - Right Hand iii) Size 1620mm x 2032mm high double doors	No No Pair	3 8 1		
8.12		<u>IRON MONGERY</u>				
8.12.1		<u>Indicator Bolts</u> Union or similar approved WC indicator bolt	No	4		
8.12.2		<u>Locksets</u> i) Single Doors: Gower or similar approved 4 lever lockset for single doors. ii) Double Doors: Gower or similar approved 4 lever lockset for double doors.	No No	12 1		
8.12.3		<u>Sundries</u>				
8.12.3.1		<u>Door Stops</u> Single and Double Doors:	No	14		
8.12.3.2		<u>Door Hooks</u> Single Doors:	No	2		
8.12.3.3		<u>Shower curtain and rails</u> 900mm chrome shower rail and curtain complete with adjustors	No	2		
TOTAL CARRIED TO SUMMARY						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						R 0.00
8.13		ROOFING AND ROOF COVERING				
8.13.1		Trusses Prefabricated Trusses Design, supply, erect prefabricated timber trusses, bracing, purlains etc. signed off by manufacturer, including profit and attendance upon subcontractor. Office building and walkway.	Sum	1		
8.13.2		Timber sundries (Erected) 114 x 38mm sawn pine wall plates Office building	m	82		
8.13.3		Fascia & Barge Boards Everite Flexit or similar approved pressed fibre cement fascia boards, 225mm x 15mm thick including H-profile jointing strips Office building	m	75		
8.13.4		Roof covering 0.6mm Chromodek IBR roof sheeting (colour charcoal - to suit existing) including Ridge flasing complete.	m ²	210		
8.13.5		Gutters i) Chromodek cold rolled profiled Gutters (Colour charcoal - to suit roof sheeting) ii) Chromodek cold rolled down pipes to suit gutters incl off-sets, bends & shoes complete. (100mmx 75mm galvanised)	m m	95 50		
8.14		PARTITIONS AND CEILINGS				
8.14.1		Ceilings Gypsum Hung Fibercement ceiling tiles of 600mm x 1200mm size including aluminium wall angles, main T's hangers etc complete. Office building	m ²	110		
8.15		FLOORING AND FLOOR COVERINGS				
8.15.1		Floor Coverings Floor Tiles - Ceramic Tiles Allow a PC sum of R450 for ceramic floor tiles, including installation, grouting edging profit and attendance complete. Boardroom, toilets, kitchen, office only	m ²	92		
8.16		SANITARY FITTING AND PLUMBING				
		SECTION : SEWERS				
	SANS 1200 LD	PIPEWORK				
8.16.1	8.2.1	Supply, lay, joint, bed Class B and test uPVC sewer pipes 110 mm diam.	m	90		
8.16.2	8.2.2	Extra-over item 5.8.1 for supply, lay, joint, bed Class B and test m specials 110 mm 45 deg. access bends	No.	4		
8.16.3	SANS 1200 LB 8.2.2.3	BEDDING MATERIALS : Supply and deliver i) Selected granular material ii) Selected fill material	m ³ m ³	15 35		
TOTAL CARRIED TO SUMMARY						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
8.16.4	SANS 1200 LD 8.2.3	MANHOLES, ETC. <u>Manholes to Dwg complete with Type 4 cover frame, for depths over and up to</u> i) 0.5 m 1,0 m ii) 1,0 m 1,5 m	No. No.	2 2		
8.16.5	8.2.7	SUNDRIES Casing to pipes, concrete mix 15/20 SECTION: WATER RETICULATION	m³	10		
	SANS 1200 DB	SITE CLEARANCE EXCAVATION				
8.16.6	8.3.2	<u>Excavation in all materials for trenches for 100mm nominal diameter pipes and smaller. Rates to backfill, compact and dispose of surplus material</u> i) Up to 1,0m deep (400 mm wide)	m	80		
8.16.7		<u>Extra-over item 5.12.2 for</u> b) Hard rock excavation (Provisional.)	m³	rate only		
	SANS 1200 LB	PIPE BEDDING				
8.16.8		<u>Selected granular material for bedding cradle for flexible pipes from</u> i) Trench excavation 275mm thick	m³	15		
8.16.9		<u>Provision of selected fill material for flexible pipe blanket</u> i) Trench excavation 200mm thick	m³	450		
	SANS1200 LB	uPVC PRESSURE PIPE AND PIPE FITTINGS				
8.16.10	8.2.1	<u>Supply, lay, bed and test the following uPVC pressure pipes (conforming with SANS 966-1976 specifications) in 6m lengths each pipe fitted at one end with socket for Mechanical jointing in the following diameters.</u> i) 75mm dia Class 9	m	250		
		FITTINGS AND SPECIALS FOR FIXING ONTO uPVC PIPES				
8.16.11	8.2.2	<u>Fittings to be suitable for coupling directly (mechanically) onto pipes. Each fitting socketed for mechanical jointing. Fittings for PVC Class16 (unless otherwise specified) Fittings to be of PVC, Cast Iron or epoxy coated steel.</u> <u>a) T- pieces</u> i) 75mm Equal Tee ii) 75mm x 63mm Reducing Tee <u>b) uPVC Long radius bends</u> i) 90 Deg. 75mm dia. ii) 45 Deg. 75mm dia. iii) 22.5 Deg. 75mm dia. iv) 11.25 Deg. 75mm dia. <u>c) CI End Cap for uPVC pipes</u> i) 75mm dia. <u>d) CI Reducer for uPVC pipes</u> i) 75mm x 63mm <u>f) RSV Gate Valves with non rising spindle, cap top, Supply and install complete as per drawing detail the following Gate valves. Incl. Valve box</u> i) 75mm dia. <u>g) Test pressure of existing pipe line</u> i) 75mm dia	no no no no no no no no no no no	4 2 4 8 4 4 4 Rate Only 20 Rate Only Rate Only		
TOTAL CARRIED FORWARD						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
		h) Supply and construct scour valves completed with manhole, covers and all fittings.				
8.16.12		i) 75mm dia <u>Concrete thrust block configuration.</u>	no	Rate Only		
		i) Concrete volume < 0,5m³ (Provisional)	no	20		
8.16.13		<u>New Tank Stand plus Tank</u>				
8.16.14		Supply install and erect 2X 10000 tanks plus 3m tankstand complete with booster pump, float switch, electrical and water connections complete.	Sum	1		
		<u>Septic Tank and Soakaway</u>				
		Construction of Septic Tank and Soakaway complete as per details contained in Project Specification and as shown on Drawing	Lump Sum	1		
		SANITARY FITTINGS				
8.16.15		<u>WC Pans and Cisterns:</u>				
		Vaal Sanitary ware vitreous china "Hibiscus" or similar approved and matching 9 litre front single flush cistern fitted complete with lid and fittings and toilet seat.	No	4		
8.16.16		<u>Wash Hand Basins</u>				
		Vaal Sanitary ware vitreous china "Flamingo" or similar approved wash hand basin including Cobra FPT2A1SG-0GT01 or similar approved Star Pillar taps	No	4		
8.16.17		<u>Kitchen Sink</u>				
		Franke Curveline 621 or similar approved Stainless Steel drop-in kitchen sink. 1235 x 435mm with double bowls and Cobra FSK2D1 SR-0GT01 Star Sink Mixer or similar approved complete	No	1		
8.16.18		<u>Showers</u>				
		Complete with Cobra Star Concealed top taps FSTAF1S5-0GT01 (2 off) and Cobra hooded shower rose and arm FSWHR107-0GT0156 or similar approved.	No	2		
		<u>Electric Water Heaters</u>				
8.16.19		<u>Solar Geysers complete.</u>				
		Kwikot 150 litre Standard Solar geyser installed complete.	No	1		
		OTHER FITTINGS				
		<u>Kitchen Fittings</u>				
		<u>Cupboards</u>				
8.16.20		White Melamine kitchen cupboards with Formica worktop (Baltic Granite) for kitchen sink made up of 2 x F1200, 2 x F600 and 1 x F450/4 drawer, modular units complete with shelving, kickplates and hinges.				
		Office	Set	1		
		<u>Bathroom Fittings</u>				
8.16.21		Coat hooks with chrome finish	No	4		
8.16.22		Toilet roll holders made from vitreous china fixed to plastered walls	No	4		
8.16.23		Single soap dish	No	2		
8.16.24		<u>Mirrors</u>				
		450 wide x 600 high x 6mm silvered float glassed foam backed mirror with 10mm beveled and polished edges four times holed for and plugged and screwed to wall with brass mirror screws and chromium plated domed caps and felt washers	No	4		
8.17		FIRE APPLIANCES				
8.17.1		Fire extinguisher installed complete with timber backing board				
		i) 9kg DCP extinguisher	No	2		
		ii) 7kg CO2 extinguisher	No	2		
		iii) 30m fire hose reels complete with all pipe work	No	1		
TOTAL CARRIED FORWARD						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
8.18		<u>PAINTWORK</u>				
8.18.1		<u>On fibre cement</u> One coat primer, one undercoat and two coats " Dulux wash and wear silk" PVA emulsion paint or similar approved. On fascias, bargeboards, weather boarding and screens	m ²	36		
8.18.2		<u>On metal</u> One coat calcium plumbate primer, one Duragrip universal undercoat and two coats Dulux silthane silk enamel paint or similar approved On door frames: i) Single Doors ii) Double Doors	No No	12 1		
8.18.3		<u>On wooden doors</u> Two Dulux Wood guard clear varnish or similar approved i) Single doors ii) Double doors	m ² m ²	40 7		
8.18.4		<u>On exposed wooden rafters & beams</u> Two Coats Creosote	m ²	35		
8.18.5		<u>On Screeded floors</u> Two coats Dulux trade Hi-Chem Epoxy enamel - Dark Grey or similar approved In store room and Generator room floor.	m ²	18		
TOTAL CARRIED TO SUMMARY						

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 9 : WORKSHOP

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
9.1	SANS 1200D	EARTHWORKS				
9.1.1	8.3.1 a)	<u>Remove topsoil to nominal depth 150 mm, stockpile, and maintain</u>	m ²	386		
9.1.2	8.3.2(a)	<u>Excavate in all materials and use for backfill compacted to 93% ModAASHTO</u>				
		i) Base footings	m ³	8		
9.1.3	8.3.2(a)	<u>Excavate in all materials and place in stockpile</u>				
		i) Base footings	m ³	51		
		ii) Strip footings	m ³	8		
9.1.4		<u>Rip and compact insitu material to 98%Mod AASHTO</u>				
		Surface beds	m ²	364		
9.1.5		<u>Import selected fill from stockpile and place in surface bed, compacted to 93% Mod AASHTO in layer n.e. 200mm</u>				
		Surface bed	m ³	73		
9.1.6		<u>Import selected fill from stockpile and place in surface bed, compacted to 95% Mod AASHTO in layer n.e. 200mm</u>				
		Surface bed	m ³	73		
9.2		WATERPROOFING				
9.2.1		<u>250micron Gunplus green waterproofing.</u>				
		Surface bed	m ²	288		
9.2.2		<u>230mm DPC</u>				
		superstructure	m	72		
9.3	SANS 1200 GA	CONCRETE (SMALL WORKS)				
9.3.1	8.2.3	<u>Narrow widths</u>				
		Not exceeding 300mm high (sides of apron slab)	m	80		
9.3.2	8.3.1	<u>Steel Bars</u>				
		High tensile steel bars in bases				
		i) R10	kg	237		
		ii) Y10	kg	304		
		iii) Y12	kg	1772		
		iv) Y16	kg	354		
9.3.3	8.3.2	<u>High tensile welded mesh reinforcement</u>				
		Reference No 395 (Surfacebed)	m ²	288		
9.3.4	8.4.3	<u>Strength concrete 30/19 Mpa</u>				
		i) Base footings	m ³	37		
		ii) Strip footings	m ³	8		
		iii) Surfacebed	m ³	43		
		iv) Apron slab	m ³	12		
9.3.5	8.4.4	<u>Unformed surface finishes</u>				
	(a)	Wood floated (apron slab)	m ²	76		
	(b)	Steel floated (power floated) (surface bed)	m ²	280		
9.3.6	8.5	<u>Construction joints</u>				
		i) 150x5mm wide Saw cut joints filled with polysulphide high modulus sealing agent.	m	120		
		ii) 150X16mm Expansion joint between concrete surface bed and brickwork, filled with bituman impregnated softboard and sealed with polysulphide high modulus sealing agent.	m	72		
		iii) 150X10mm thick Sondor joint sealer, wrapped around steel columns	no	14		
CARRIED FORWARD						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
9.3.7	8.7	<u>Grouting</u>				
	(a)	30Mpa non-shrink grout under column bases	m ³	0.2		
9.3.8	8.8	<u>HD Bolts</u>				
		M20X 450mm long HDG Anchor bolts with 120mm thread including nut and washer.	t	0.072		
9.4		BUILDING WORKS (LABOUR INTENSIVE)				
		<u>Masonry work</u>				
9.4.1		<u>Foundation brickwork</u>				
		<u>Brickwork of non-facing bricks in class II mortar</u>				
		One brick wall	m ²	12		
9.4.2		<u>Superstructure</u>				
		<u>Face brickwork</u>				
		Face bricks (allow a PC amount of R6500.00per thousand bricks, supplied, delivered to site) and add for taking delivery, laying, bedding and jointing, storage, waste and profit.				
9.4.2.1		One brickwall both sides faced	m ²	108		
9.4.2.2		Brick on edge header corse for 230 coping	m	60		
9.4.3		<u>Brick reinforcing</u>				
		150mm brickforce laid horizontally every third course	m	282		
9.5	SANS 1200H	FABRICATION, DELIVERY AND ERECTION OF STRUCTURAL STEELWORK AND CLADDING				
		<u>Structural steelwork design and shop drawings</u>				
9.5.1	8.3.1.1	Preparation of shop detail drawings	Sum	1		
	8.3.1.2	<u>Supply, fabrication, delivery and erection of structural steel.</u>				
9.5.2		Columns - 203x133x25 I	t	1.6		
9.5.3		Columns - IPE 200	t	0.3		
9.5.4		Beams - IPE 140AA	t	0.7		
9.5.5		Purlins & Girts - 175x75x20x2.5CFLC	t	0.3		
9.5.6		Sag angles - 40x40x3L	t	0.3		
9.5.7		Rafter Bracing - 70x70x6L	t	0.4		
9.5.8		Vert-Bracing - 70x70x6L	t	0.3		
9.5.9		Vert-Bracing - 50x50x3L	t	0.3		
9.5.10		Nuts Bolts and connections	t	0.4		
	8.3.2	<u>Delivery of Steel</u>				
9.5.11	8.3.2.1	Normal Delivery of steel	t	4.6		
9.5.12	8.3.3	Erection on site	t	4.6		
9.6	8.3.13	CORROSION PROTECTION-PAINT				
9.6.1		1X coat Red/Grey oxide to all members applied at point of manufacture and touched up prior to application of 2x Coats Dulux Silthane silk enamel or similar approved, on Site.				
	8.3.13	Extra over Items .....for Corrosion protection and painting.	t	4.6		
CARRIED FORWARD						

C2.2 Bill of Quantities

ITEM No.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
9.7	SANS1200HB	CLADDING AND SHEETING (LABOUR INTENSIVE) <u>Supply and install side cladding and sheeting</u> <u>0.6mm 'Chromodek' roof sheeting on roof and partial side cladding fixed to steel purlains and side girders. Colour for Engineers approval (Charcoal to suit existing)</u>				
9.7.1	8.2.2	Roof sheeting	m ²	291		
9.7.2	8.2.2	Side cladding <u>Translucent sheeting fixed to steel girders.</u>	m ²	210		
9.7.3	8.2.2	Side cladding	m ²	50		
	8.2.3	<u>Supply and install ancillaries</u>				
9.7.4	8.2.3	Bullnosing of chromodek sheets	m	80		
9.7.5	8.2.3	450-600mm flashings(ridge,gable, bullnose)	m	70		
9.7.6	8.2.3	350-450mm flashings (drip flashings)	m	73.6		
9.8		ELECTRICAL <u>Provisional</u>				
9.8.1		Allow an amount of R45 000,00 for provision of electrical works for the MRF building.	Prov Sum	1		
TOTAL CARRIED TO SUMMARY						

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 10 : SERVICES

ITEM NO.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
10.1		ELECTRICIAL SUPPLY				
10.1.1		Allow for wiring of solar electricity connection for three phase electrical supply to Offices and workshop incl supply cables, termination and testing etc.	Prov Sum	1	R 250 000.00	R 250 000.00
10.1.2		Supply and install solar equipment including panels, panel mounting, 8Kva inverter-controller and 2 x 10Kw lithium Iron batteries.	Prov Sum	1	R 250 000.00	R 250 000.00
10.2		SEWER RETICULATION				
10.2.1		Allow for municipal connection of sewer reticulation, connected to Offices including pipework connections and testing etc.	Prov Sum	1	R 100 000.00	R 100 000.00
10.3		WATER RETICULATION				
10.3.1		Allow for municipal connection for water reticulation including all pipework to Offices, MRF and Washbay	Prov Sum	1	R 100 000.00	R 100 000.00
TOTAL CARRIED TO SUMMARY						R 700 000.00

C2.2 Bill of Quantities

CWDM CLASS B LANDFILL

CONTRACT NUMBER: _____

SECTION 11 : MISCELLANEOUS

ITEM NO.	PAYMENT REFER.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
11.1	PAF1.2.1	SIGNAGE				
11.1.1		Supply and installation of signage on perimeter fence (no entry, no swimming), public information boards, Health-and Safety	Prov Sum	1	R 50 000.00	R 50 000.00
11.2	PAF1.2.1	Health and Safety Equipment				
11.2.1		Supply and mount floatation rings at dams	No	2		
11.3		LANDSCAPING				
11.3.1		Level area of garden at Offices	m ²	80		
11.3.2		Place topsoil in garden areas at Offices, where required	m ²	80		
11.3.3		Plant lawn seed and fertiliser as per specification and water until established	m ²	80		
11.4		WASH BAY				
11.4.1		Supply and install modular washbay	Prov Sum	1	R 150 000.00	R 150 000.00
11.4.2		Install concrete slab at washbay- under Roads bill??				
11.5		WEATHER STATION				
11.5.1		Supply and Install weather station unit, as per specification	Prov Sum	1	R 30 000.00	R 30 000.00
11.6		BOREHOLES				
11.6.1		Install monitoring boreholes 30m deep, steel sleeved for fist 6m, with lockable cap, keys and lock	No.	2		
11.7		PUMP				
11.7.1		Portable or Fixed pump for leachate dam truck filling / filling water cart from C.W. dam	No.	1		
TOTAL CARRIED TO SUMMARY						R 230 000.00

CONSTRUCTION OF A CLASS B LANDFILL for Worcester, CWDM

		Amount	
		R	c
<u>SUMMARY</u>			
1	Preliminary and General	R	
2	Cell 1	R	
3	Contaminated Water Dam	R	
4	Leachate Dam	R	
5	Stormwater Drains	R	
6	Roads	R	
7	Fencing	R	
8	Offices	R	
9	Workshop	R	
10	Services	R	
11	Miscellaneous	R	
SUB-TOTAL		R	
<u>CONTINGENCIES</u>			
Allow the sum of 5% (five percent) of the above Sub-total for Contingencies to be spent as the Engineer may direct and to be deducted in whole or in part if not required.		R	
TOTAL INCLUDING CONTINGENCIES		R	
<u>VALUE ADDED TAX</u>			
ADD: VAT at the rate of 15%		R	
Carried to part C1.1 Form of Offer and Acceptance		R	

DECLARATION (In respect of completeness of Tender)

Cape Winelands District Municipality
29 Du Toit Street
STELLENBOSCH
7599

I/we, the undersigned, do hereby declare that these are the properly priced Bills of Quantities forming part C2.2 of this Contract Document containing 25 pages (Pages 82 to 107) in consecutive order upon which my/our tender for **TENDER NO. T 2023/022: CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER CWDM** has been based.

SIGNATURE OF TENDERER/S

DATE

Part C3: Scope of Work

	Pages
C3.1 Description of the Works	113-114
C3.2 Engineering	115
C3.3 Construction: Works Specifications	116-211
C3.4 Management.....	212-214

Status

Should any requirement or provision in the parts of the Scope of Work conflict with any requirement of any Standardised Specification, particular specification or any drawings, the order of precedence, unless otherwise specified, is:

- Drawings
- Scope of Work (Parts C3.1, C3.2, C3.3 and C3.4)
- SANS Standardised Specifications

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

C3.1 Description of the Works

C3.1.1 Employers Objectives

C3.1.2 Overview of the Works

C3.1.3 Extent of the Works

C3.1.4 Location of the Works

C3.1.5 Location of Contractor's Camp Site

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

C3.1 Description of the Works

C3.1.1 Employers Objectives

The Employer's objective is to continue providing waste disposal facilities for the Worcester area. With the existing landfill now full, a new landfill has been licenced and designed, for the site alongside the old landfill, 4 km south-east of Worcester, within the Cape Winelands. This tender encompasses the first phase of the landfill development (Cell 1) and related infrastructure.

The description of the project contained in the Scope of Work is merely an outline of the Contract Works and shall not limit the work to be carried out by the Contractor under this Contract. Details of some of the major items are given in this section and approximate detailed quantities for each type of work to be carried out in accordance with the Contract Documents are included in the Bill of Quantities.

It is however emphasized that the successful contractor will have to make use of local labour and subcontractors for the completion of the works. The municipality will provide the successful contractor with a list of names of the labourers and subcontractors from which he may choose to work on the contract upon commencement of the contract.

An objective of the project is to provide for a minimum contract participation goal (CPG) of 5% of the total project value and to develop targeted enterprises by the main or lead partner contractor. The successful contractor shall:

- Subcontract a minimum of 5% of the total project value to targeted enterprises;
- Develop the targeted enterprise/s in two developmental areas as specified in the Standard, and agreed by both the main contractor and the targeted enterprise/s;
- Perform a needs analysis on the targeted enterprise to identify developmental goals;
- Provide internal mentorship support to improve the targeted enterprise's performance;
- Develop a project specific enterprise development plan to improve the targeted enterprise/s performance in identified development areas;
- Monitor and report the progress of the agreed development areas with the targeted enterprise /s; and
- Submit a project completion report to the Employer's representative for each targeted enterprise.

The development of the Targeted Enterprise shall be guided by the **CIDB Competence Standard for Contractors Gazette No. 41237, 10 November 2017**, especially Table 2, that outlines the minimum qualifications a targeted enterprise is developing towards.

C3.1.2 Overview of the Works

The works consists of engineering interventions at Worcester Landfill Site. Typical interventions introduced include the bulk earthworks for Cell 1, Leachate Dam and Contaminated Water Dam, followed by the installation of Class B barrier (liner) system and dam barriers, with associated infrastructure. The works include:

- Cell 1
- Leachate Dam
- Contaminated Water Dam
- Offices Building
- Workshop Building
- Washbay
- Gravel Roads
- Paved Parking Area
- Stormwater drains
- Fencing
- Provision of Services

C3.1.3 Extent of the Works

Scope:

The general scope of works includes the follows:

- Site clearance
- Removal and stockpiling of topsoils
- Cell 1 bulk earthworks
- Leachate Dam bulk earthworks
- Contaminated Water Dam bulk earthworks
- Cell 1 Class B liner installation using geosynthetic materials and stones
- Leachate Dam liner installation using geosynthetic materials
- Contaminated Water Dam using geosynthetic materials
- Installation of perforated pipe drainage systems for leachate and leakage detection (Cell 1 and dam)
- Gravel ring road with 2 paved truck sidings at dams
- Offices Building
- Workshop Building
- Internal water supply and connection to municipal water
- Sewer connection and reticulation
- Electrical connection to municipal supply and internal reticulation
- Washbay
- Block paved Parking Area, with kerbing
- Landscaping at offices i.e. levelling, topsoiling and grass seeding
- Stormwater earth v-drains
- Stormwater concrete lined v-drains
- Installation of stormwater pipe culverts and wingwalls
- Perimeter welded mesh security fencing
- Fencing around dams
- Information and road signage and markings
- Weather station installation
- 2 monitoring boreholes
- Construction and as-built Survey.

C3.1.4 Location of the Works

The location of the landfill site to be constructed is on the outskirts of the town of Worcester, alongside the existing landfill site, 4 km south-east of the town centre. It is located in the Breede Valley Local Municipality which forms part of the greater Cape Winelands District Municipality.

The town of Worcester is located ± 110 km northeast of Cape Town.

C3.1.5 Location of Contractor's Camp Site

The Contractor may locate his site offices, depot, and camp at the landfill site west of the existing entrance infrastructure in an area set aside for a future composting area, subject to approval in writing of the location thereof by the Engineer and the Employer.

The Contractor shall be responsible for obtaining the necessary permission/s from the relevant authorities and communities for the establishment of the offices, camp and depot and for all arrangements for the housing of the Contract workforce. No part of any National or Provincial Road reserve may be used for either the Contractor's camp or for housing the Contractor's workforce.

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

C3.2 Engineering

C3.2.1 Drawings issued with this document

Drawings which form part of the tender documents are listed below:

DRAWING NO	DESCRIPTION
754-2022-001	General Survey and Farm Portions
754-2022-002	Site Infrastructure Layout
754-2022-003	Workshop, Site Admin Offices and Ablutions Layout SHT 1 of 3
754-2022-003	Site Admin Offices and Ablutions SHT 2 of 3
754-2022-003	Workshop Details and Setting Out SHT 3 of 3
754-2022-009	Cell 1 Excavation Layout Plan
754-2022-010	Cell 1 Excavation Sections
754-2022-013	Landfill Cells Liner, Typical Details
754-2022-015	Leachate Collection System- Cell 1 Layout SHT 1 of 2
754-2022-015	Leachate Collection System- Cell 1 Sections and Details SHT 2 of 2
754-2022-016	Leachate Dam Layout
754-2022-017	Leachate Dam Sections
754-2022-018	Leachate Dam Sections and Details
754-2022-019	General Stormwater Layout
754-2022-020	Stormwater V-Drain, Plan and Profile SHT 1
754-2022-021	Stormwater V-Drain, Plan and Profile SHT 2
754-2022-022	Stormwater V-Drain, Plan and Profile SHT 3
754-2022-023	General Layout, Roads Layout
754-2022-024	Access Road Profile, Plan and Profile SHT 1
754-2022-025	Access Road Profile, Plan and Profile SHT 2
754-2022-026	Access Road Profile, Plan and Profile SHT 3
754-2022-027	Access Road 1, Cross Sections SHT 1
754-2022-028	Access Road 1 and 2, Cross Sections SHT 2
754-2022-029	Contaminated Stormwater Dam, Layout Plan
754-2022-030	Contaminated Stormwater Dam, Sections and Details
754-2022-031	Fencing Layout
754-2022-032	Dams Spillway Details
754-2022-033	Construction Nameboard Details

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

C3.3 Construction

C3.3.1 Applicable Standardised Specifications

C3.3.2 Plant and Materials

C3.3.3 Existing Services

C3.3.4 Site Establishment and Facilities

C3.3.5 Amendments to Standardised Specifications

C3.3.6 Particular Specifications

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

C3.3 Construction

C3.3.1 Applicable Standardised Specifications

For the purpose of this Contract, the following SABS 1200 Standardised Specifications shall apply:

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 DK	:	Gabions and Pitching
SABS 1200 DM	:	Earthworks (roads, subgrade)
SABS 1200 GA	:	Concrete (small works)
SABS 1200 GB	:	Concrete (ordinary buildings)
SABS 1200 H	:	Structural Steelwork
SABS 1200 HB	:	Cladding and sheeting
SABS 1200 HC	:	Corrosion protection
SABS 1200 LB	:	Bedding (pipes)
SABS 1200 LD	:	Pipework
SABS 1200 LE	:	Stormwater Drainage
SABS 1200 M	:	Roads (general)
SABS 1200 ME	:	Subbase
SABS 1200 MF	:	Base
SABS 1200 MJ	:	Segmented paving
SABS 1200 MK	:	Kerbing and Channelling
SABS 1200 MM	:	Ancillary roadworks
SANS 10409	:	Design, selection and installation of geomembranes

Variations to the Standardised Specifications are given in C3.3.5

C3.3.2 Plant and Materials

Specific items relating to plant and materials are given in the variations to the standardized specifications specifically under Section PSA.

C3.3.3 Existing Services

General

Existing services indicated on the contract drawings show the approximate positions of all existing services. The accuracy of/ or completeness of this information is not guaranteed. The Contractor shall verify details, positions and levels of existing services and connection points well in advance of undertaking related works to prevent any possible delay if such services are not as indicated or assumed. No claims related to the late verification of existing services shall be entertained.

Any service which requires relocation in order to remain operational shall be done so timeously and will need to be planned accordingly.

The Contractor shall apply for the necessary wayleaves from all Authorities before commencement of work. No claims relating to invalid wayleaves will be entertained.

The Contractor shall note that no mechanical excavators or vibrator type compactors may be used within three (3) metres of any electrical services. No pegs or stakes shall be driven into the ground in the vicinity of underground services unless their exact positions have been determined.

No excavation may take place near underground electrical services until a guarantee has been approved by the Local Authority and a permit has been issued by the authorising authority.

C3.3.4 Site Establishment and Facilities

C3.3.4.1 Site Facilities Available

Source of Water Supply

The contractor shall make his own arrangements to draw water for construction and drinking purposes from the existing water supply system at a metered standpipe provided by the Local Authority. Costs for water usage shall be borne by the Contractor.

Source of Power Supply

The Contractor shall make his own arrangements for electrical power and lighting.

Location of Camp and Depot

The Contractor shall make his own arrangements with regards to the position of a camp site for this contract.

Ablution Facilities

The contractor shall provide and maintain toilet and ablution facilities for his staff at suitable locations agreed with the engineer.

Disposal Sites

The contractor shall dispose of all material unsuitable for use in earthworks operations at a licensed landfill site or other suitable location of the contractor's choice.

Excavation and Stockpile on Site

All transportation of material anywhere on the site will be deemed to be freehaul.

C3.3.4.2 Site Facilities Required

Facilities required by the Engineer are listed in PSAB : Engineers Office.

C3.3.4.3 Features Requiring Special Attention

Safety Regulations

All references to the "Factories, Machinery and Building Work Act (Act 22 of 1941)" and the "Machinery and Occupational Safety Act (Act 6 of 1983)" must, wherever they appear in the SABS 1200 Standardised Specifications, be substituted by the "Occupational Health and Safety Act (Act 85 of 1993)".

This contract shall be subject to the provisions of the Occupational Health and Safety Act and Construction Regulations 2014 and the Contractor shall be required to comply with the applicable regulations, especially regarding safety on Site and the provision of first aid and facilities.

The Contractors attention is drawn to Particular Specification PHS Occupational Health and Safety, attached to this document in C3.4.

C3.3.5 Amendments to Standardised Specifications

The following variations and additions to the SABS 1200 Standardised Specifications referred to in C3.3.1 shall apply to this contract. The prefix PS indicates an amendment to the SABS 1200 code. The letters and numbers following these prefixes indicate the relevant Specification and Clause number in SABS 1200 to which the variation or addition applies.

PSA GENERAL (SABS 1200A)

PSA 3 MATERIALS (SUBCLAUSE 3.1)

PSA 3.1 Approval of Material

Amend subclause 3.1 to read as follows:

The Engineer will take samples from stockpiles of proposed construction materials on site. Approval will not be granted for samples delivered direct to the Engineer's office. The onus is on the Contractor to provide recent test results on all commercially obtained material to the Engineer at least 14 days prior to its intended use in the works.

The Contractor shall be responsible for the cost of all failures on test samples and control testing.

PSA 3.3 Storage of Materials

Rubber articles, including pipe insertion or joint rings, shall be stored in a suitable shed and kept away from sunlight, oil or grease. Living accommodation shall not be used for the storage of materials.

Large items not normally stored in a building shall be neatly stacked or laid out on suitable cleared areas on the Site. Grass or vegetation shall not be allowed to grow long in the storage areas and the material shall be kept free of dust and mud and be protected from stormwater. Pipes shall be handled and stacked in accordance with the manufacturer's recommendations, special care being taken to avoid stacking to excessive heights and placing over hard objects. uPVC pipes shall be protected from direct sunlight by suitable covers.

Every precaution shall be taken to keep cement dry and prevent access of moisture to it from the time it leaves the place of manufacture until it is required for use on the Site. Bags of cement which show any degree of hydration and setting shall be removed from the Site of the Works and replaced at the Contractor's own expense.

PSA 3.4 Handling of Materials

Materials should be handled with proper care at all times. Under no circumstances may materials be dropped from vehicles. Large pipes shall be lifted or lowered only by means of suitable hoisting equipment.

The Engineer shall have authority to reject any material which in his opinion have been handled / transported in a manner which may have led to damage.

PSA 5 CONSTRUCTION

PSA 5.51 SURVEY

PSA 5.1.1 Setting Out of the Works (Subclause 5.1.1)

Survey beacons will be pointed out to the Contractor at the commencement of the contract. It is the Contractor's sole responsibility to ensure that these beacons as pointed out to him on site are not covered, disturbed or damaged.

All costs for the reinstatement of such beacons are to be borne by the Contractor.

The Contractor shall check the levels of all reference pegs, benchmarks and line pegs well before he intends constructing any portion of the Works influenced thereby. The Engineer shall be informed in writing of any discrepancy discovered in the positions or levels immediately on discovery but in any event at least 7 days before such construction is due to start.

If no written statement is received from the Contractor, it will be held that the Contractor has satisfied himself that the positions and levels of the reference pegs and bench marks are correct.

Any errors or suspected discrepancies with regard to levels, co-ordinates, dimensions or other related aspects of the existing or proposed works that come to light during the execution of the Works shall be brought to the attention of the Engineer without delay.

PSA 5.2 Watching, Barricading, Lighting (Subclause 5.2)

From the time any portion of the Works commences, until the end of the Contract Period, the Contractor shall be responsible for protecting the property of the Employer and all persons having business on the Site from anything dangerous or likely to cause damage or injury. The Contractor shall take all practical precautions to avoid nuisance or inconvenience to the owners or occupiers of properties near to the Site and to the public generally whilst carrying out the Works and shall at all times keep the Site clean and in a safe and satisfactory condition.

PSA 5.4 Dealing With Existing Services (Subclause 5.4)

The Contractor shall locate all existing services according to available records and mark them as known services. Where a known service is damaged because of the Contractor's negligence, the service shall be repaired in accordance with the requirements of the Authority concerned. All costs of repair will be for the Contractor's account and the Contractor shall indemnify the Employer against any claims that may be made.

Before the commencement of any excavation the Contractor shall inform the staff of the Employer works directly concerned with the control of the service, shall acquaint himself with the position of the service and shall have readily available the equipment necessary to shut-off and isolate any such service. The Contractor shall liaise with the staff on site for the necessary temporary closure of any services during construction.

The Contractor shall not commence work on any section until proper arrangements have been made for supervision of the work and have informed the Engineer accordingly.

The Contractor shall carefully excavate on the line of the trench up to 2,0m in both directions from the indicated position for the purpose of locating and establishing the exact position of the services under the supervision of the Engineer's Representative and the authority involved.

Alterations to existing services carried out by the Contractor shall be executed as expeditiously as possible in order to minimize the disruption of the service. After completing the relocation of existing services and acceptance thereof by the Engineer the pipes shall be joined up and parts that have become redundant shall be removed. This work shall be carried out in such a way that the least possible inconvenience is caused to the user of the service.

In cases where other authorities must alter or remove existing services, the Contractor shall make the necessary arrangements and assist the relevant authority.

Electric cables

The Contractor shall at all times accept that all underground and overhead cables are live and that the Cape Winelands District Municipality, Spoornet or Eskom in its capacity as either the Employer or the owner of the service shall not be held liable for injury or death of any person due to live electric cables exposed under the Contract.

The Contractor shall advise the Council's representative and the Engineer 7 days in advance of the actual date on which he proposes to excavate near any electric cable.

The Contractor shall not commence any construction in the vicinity of electric cables before contacting the Council regarding the procedures for construction in the vicinity of electric cables.

Where excavation takes place approximately parallel to and within 3 m of an 11 kV cable the method of excavation shall be as approved by the Council or service authority.

The Contractor shall not excavate with mechanical equipment closer than 3 m to the estimated position of any cable but shall expose the cable by hand excavation under proper supervision. When so instructed, the Contractor shall backfill cable trenches to the density ordered.

The Contractor shall be responsible for the temporary support and realignment of cables as necessary.

Subsequent to the training it is anticipated that the people will be employed on various aspects of the project.

PSA 5.9 ACCOMMODATION OF TRAFFIC

PSA 5.9.1 General

The Contractor shall take all precautions necessary to programme and conduct his construction operations in such a manner that inconvenience and annoyance to public traffic, property owners and road users is kept to a minimum. The Contractor shall also ensure that safety requirements are strictly enforced at all times.

The contractor shall be responsible for maintaining the existing road surface both within the works area and the advance warning and termination areas in a safe and trafficable condition for the duration of the contract.

The accommodation of traffic shall remain the Contractor's responsibility notwithstanding any arrangements with the local authority to the contrary.

It is a condition of this contract that traffic is accommodated taking into account the provisions of the latest edition of the South African Road Traffic Signs Manual (SARTSM). The latest version for use in the accommodation of traffic is volume 2, chapter 13 of the June 1999 edition. Copies of this publication are available from Government Printers – Monica Chiloane – Tel: (012) 334 4508 e-mail: monica.chiloane@gpw.gov.za

The programming of the works shall conform to the applicable requirements of PSA 5. The contractor shall comply with these requirements as well as the guidelines set out below when planning the accommodation of traffic during construction.

PSA 5.9.2 Overall Requirements

The contractor shall so plan his work such that the traffic, at all times, is free flowing during the construction period.

An accommodation of traffic method statement shall be formally submitted to the Engineer for approval, and once approved, will form the basis of all related construction activities. It will be closely linked to the Contractors programme and will be monitored accordingly.

The Contractor shall liaise with and co-operate with the relevant Traffic authorities wherever the works affect existing roads. The Contractor shall sign an indemnity clearing the Local or Roads Authority, as applicable, from all liabilities in respect of excavations and works on or adjacent to trafficked roads.

PSA 5.9.3 Barricades and Signs

The Contractor shall provide and erect all necessary barricades, barriers, signs, signals, lights, etc., with posts as necessary, which shall be maintained in good condition and he shall provide a sufficient number of watchmen and flagmen where required and shall take all necessary precautions for the protection of the work and for the safety of the travelling public. All traffic signs and the control of traffic shall be in accordance with the drawings issued and provisions of SARTSM.

When additional electrically operated flashing type amber warning lamps are required, these shall be measured and paid for separately.

Drums shall not be used to demarcate traffic lanes. Delineators and barricades as allowed for in SARTSM Vol 2 Chapter 13 shall be used.

PSA 7 TESTING

PSA 7.1 Testing Principles (Subclause 7.1)

a) Testing of roadwork rehabilitation and the like

Every completed section of rehabilitated road shall be subject to check testing by the Contractor. Once the Contractor has satisfied himself with the standard of his works, the Engineer will be requested to perform acceptance testing for the particular section. When giving notice, the Contractor shall provide the Engineer with the results of his own check testing indicating that the work is to specification, or advise the Engineer in writing that, although no tests have been performed, he is confident that the specification has been met.

Failure by the Contractor to notify the Engineer or to provide the required information or, where specified, to perform the required test, will be grounds to exempt the Employer from payment for the associated work and for all subsequent work which would be affected by the failure of the work to be tested.

The Engineer will be under no obligation to the Contractor to perform the tests. If the Engineer elects not to perform a particular test after notification by the Contractor, he will issue the Contractor with a written instruction to proceed with the relevant works without the acceptance test being performed. The Engineer's Representative will agree at commencement of the contract minimum acceptance testing requirements for each component of work.

Nothing contained in this clause will relieve the Contractor of his responsibilities under the specification or in any way limit the tests which the Engineer may call for or perform in terms of the specification.

PSA 7.2 Approved Laboratories (Subclause 7.2)

Acceptance testing of materials used in the construction of the works shall be done by a laboratory appointed by the Engineer and approved by the Employer. The Engineer requires twenty-four hours' notice from the Contractor in order to perform the relevant acceptance test. Failure by the Contractor to notify the Engineer or to provide the required information or, where specified, to perform the required test, will be grounds to exempt the Employer from payment for the associated work and for all subsequent work which would be affected by the failure of the work to be tested.

All acceptance testing by the Engineer shall be paid by the Contractor. The costs of such tests which meet the specification requirements will be reimbursed to the Contractor in the monthly payment certified.

A Provisional Sum has been provided in Section 1 of the Schedule of Quantities to allow for the cost of such acceptance testing. Acceptance testing will in no way relieve the Contractor from his own check testing.

The Contractor shall make due allowance for testing procedures in his construction programme.

PSA 7.5 As-Built Information

As the works are progressing, the Contractor shall mark on a special set of drawings after checking the information, all as built details and submit them to the Engineer's Representative for approval on a regular basis. Payment shall be made under "Contractual Requirements."

The Certificate of Completion as well as the corresponding payment certificate shall only be issued upon the submission of all the as-built information.

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.4 Schedules time-related items

PSA 8.4.6 Standing Time Cost

- a) plantUnit: Sum per working days
- b) labourUnit: Sum per working days
- c) other resources (to be specified by Contractor)Unit: Sum per working days

The tendered sum for each item shall include full compensation for all standing time costs at the specified resource of whatever nature and approved by the Engineer, which are not recoverable by way of the provision made in PSA 8.2.5 for the adjusted payment of time related items.

For the purposes of calculating the total standing time cost, a working week shall be held to consist of five working days and a working day of 9 hours.

Payment for the partial standing of any of the scheduled resources for a day or part thereof or the standing of a complete resource for a part day, will be made pro rata in proportion to an appropriate factor assessed by the Engineer.

The amount by which the standing time cost is adjusted shall be subject to the contract price adjustment formula as defined in the conditions of contract.

The Contractor shall take note that this payment item shall only apply to delays, which **in the opinion of the Engineer**, are incurred as a result of riot, commotion, politically motivated sabotage and acts of terrorism or disorder outside the Contractor's control.

This item shall also apply to standing time incurred as a result of labour boycotts, except that only sub-items (a) and (c), as applicable, will be paid where the Contractor did not pay his labour for the time boycotted. Costs for delays incurred for all other circumstance shall be treated as provided for in the conditions of contract.

The provision of the clause shall in no way prejudice the right of either the Employer or the Contractor to determine the contract items of the provisions of clause 57 of the general conditions of contract. The Contractor shall take note that no payment will be considered for additional cost of time lost for any daily removal of plant and equipment from the site, any additional costs incurred in protecting his plant and site establishment, or loss incurred in respect of damage to construction plant, equipment and materials supplied and the works.

In the event that GCC 6.8.1 becomes applicable, the time on which such penalties are calculated shall be reduce by the total standing time approved by the Engineer.

PS A 8.5: Provisional sums stated by Engineer.....Unit: Prov. Sum

Payment will be made in accordance with actual invoiced costs and a percentage mark-up to cover the contractor's overheads, profit and attendance.

PSA 8.7 DAYWORK

Daywork will be paid according to the rates provided in the schedule. Specific items are scheduled in the Schedule of Quantities.

PSA8 9 OCCUPATIONAL HEALTH AND SAFETY (PROVISIONAL)

PSA8.9.1 Health And Safety Requirements Unit : Sum

The rate shall cover all costs pertaining to the provision and maintenance for the duration of the contract of the health and safety measures required in terms of Clause 5 (Principal Contractor and Contractor) of the Construction Regulations (2014) of the Occupational Health and Safety Act. No other sum shall be paid in this respect and Tenderers must therefore ensure that adequate provision has been allowed for.

The rate shall include for all risk assessments required as well as for the development and implementation of safe work procedures and method statements. A comprehensive, documented Health & Safety Plan (H&S Plan) is to be drawn up based on the specifications provided, and to be presented to the agent for approval prior to commencement of work / together with the tender documents. No other sum shall be part in the respect and Tenderers must therefore ensure that adequate provision has been allowed for.

The rate shall also cover all cost pertaining to the provision and/or collection of data (drawn, design, materials, operation and maintenance manuals, etc) to be contained in the file operation with other parties, compilation and maintenance of the file during the duration of contract and the handing over of the file to the Client on completion of the contract. No other sum shall be paid in this respect and Tenderers must therefore ensure the adequate provision has been allowed for.

PSAB ENGINEER'S OFFICE

PSAB 3.1 Nameboard (Subclause 3.1)

A Nameboard as per drawing provided is to be erected within 14 days of Site Establishment and must be visible from the main road (R43).

PSAB 4.1 Telephone and Fax (Subclause 4.1)

The cost of telephone calls made by the Resident Engineer shall be covered by the contractor's rates to the extent that this will not exceed R1000 per month or the provisional sum stated in the schedule. Fax facilities must be provided by the Contractor for his own use and shall be available to the Resident Engineer.

PSAB 4.2 Computer (Subclause 4.2)

No computer facilities are required for the Engineer and his staff.

PSAB 5.5 Survey Equipment and Survey Assistant (Subclause 5.5)

The Contractor shall make available the following survey equipment from time to time for use by the Engineer or his representative, when required:

- (a) One automatic level and tripod with 360° circle and 5m aluminium level staff.
- (b) One tachometer capable of reading 20 seconds of arc and tripod.
- (c) One steel tape, nylon covered, of 50m length, in grip handle case.
- (d) Five ranging rods of 2m length.
- (e) All steel and wood pegs, hammer, picks etc, that may be required
- (f) Measuring wheel

The equipment shall be of a quality and condition acceptable to the Engineer, and may be used in a shared arrangement between the Contractor and the Engineer's representative.

The Contractor shall keep the equipment continuously insured against any loss, damage or breakage and he shall indemnify the Engineer and the Employer against any claims in this regard. Upon completion of the whole of the Works, the ownership of the equipment shall revert to the Contractor. The Contractor shall maintain the equipment in good working order and keep it clean throughout the contract period.

One or two survey assistants shall be made available to the Engineer by the Contractor, when required.

PSAB 5.6 Transport for the Engineer's Representative

No transport is required for the Engineers Representative.

PSAB 5.7 Site Instructions

Throughout the construction period the Contractor shall supply a carbon quadruplicate book as a site instruction book.

This book shall be kept on Site and shall be accessible to both the Contractor and the Engineer at all times. It shall be used:

- a) by the Contractor for providing the Engineer with any information regarding the construction of the Works which may be requested, and giving notification in writing of inspections, drawings, etc, required by the Contractor, and
- b) by the Engineer for the purpose of writing day-to-day instructions and confirming any verbal information or instructions given to the Contractor.

One copy of each site note issued shall remain in the book.

PSC SITE CLEARANCE

PSC3 MATERIALS

PSC3.1 Disposal Of Material

Replace subclause C3.1 with the following:

The Contractor shall make his own arrangements for the provision of a suitable place to dispose of waste material obtained from clearing and grubbing, operations.

No cleared material may be stockpiled within the operational areas the site and it will be the Contractor's duty to remove this material to a spoil dump as soon as possible after clearing.

PSC 5.1 Clearing

Add to subclause 5.1:

Only areas which are required specifically for the activities of the contract shall be cleared. Payment shall be in accordance with 8.2.1 except that all cleared non-reusable material shall be removed to a spoil dump off site chosen by the contractor.

PSC 5.9 REMOVAL OF EXISTING KERBS AND CHANNELS

PSC 5.9.1 Clearance

It will be necessary to remove existing kerbs and channels in order to facilitate improvements required to the roads and parking areas.

Kerbs and channels shall be removed carefully complete with bedding and backing and causing as little damage to the existing roadway as possible.

PSC 5.10 CUT AND REMOVE PREMIX AND BASECOURSE/SUBBASE

PSC 5.10.1 Scope

Where an existing roadway is to be removed, the subbase and basecourse shall be conserved as far as possible for later reuse in the works as subbase. Premix should be stripped off prior to the base and subbase layer being removed and taken off site to spoil.

The premix and base layers shall be cut neatly at the interface between disturbed and undisturbed roadways.

PSC 8 SCHEDULED ITEMS

PSC8.2.11 Cut and remove premix to spoil.....Unit: m³

The rate will include cutting neatly where required stripping existing premix and removing it to spoil.

PSC8.2.12 Excavate basecourse and subbase to temporary stockpile.....Unit: m³

The rate shall cover the cost of excavating existing basecourse and subbase from the existing roadway, transporting and stockpiling within the site camp area for later use in the roadway.

PSC8.2.13 Remove and stockpile existing kerbs and channels.....Unit : m

The rate shall include for all labour and equipment required to remove the kerbs, transporting and stockpiling within the site camp area for later use in the roadway.

PSC8.2.14 Demolish and remove existing structures.....Unit : No. or m³

The rate shall cover the cost of demolishing, excavation, transport of surplus material to a spoil site, backfilling and compacting the void including supply of fill material.

The Tenderer rate shall include for the following:

- a) A site visit must be conducted to establish the exact scope of works required in demolishing the structure.
- b) All measurements of the existing structures if required must be performed on site.
- c) The maintenance of the existing roads and any deviations or temporary sections of road, throughout the conclusion of works
- d) Any other operation or thing whatsoever required to implement the accommodation of traffic to the satisfaction of the Engineer.
- e) The Contractor shall verify details, positions and levels of existing services and connection points well in advance of undertaking related works to prevent any possible delay if such services are not as indicated or assumed. No claims related to the late verification of existing services shall be entertained.

PSD EARTHWORKS

PSD 2.3 Definitions (Subclause 2.3)

PSD 2.3.1 Sand

Sand is defined as non-plastic material that conforms to the following grading analysis:

% passing	4.750 mm sieve 95% min
	0.425 mm sieve 50% min
	0.075 mm sieve 10% max

and having a maximum swell of 1.5% at 100% Mod AASHTO density.

PS D 3.3.1: General

Substitute the second paragraph of D 3.3.1 with the following:

The Contractor shall deal selectively with material from general excavation. Any imported material in road reserves that does not comply with the minimum requirements for the respective layers, shall be removed and replaced with suitable material, all at the Contractor's expense.

The Contractor shall deal in such a way with materials from all excavations for streets, channels or pipe trenches to ensure that usable material is not contaminated with unsuitable material. If usable material is contaminated, such contaminated material shall be removed and replaced with suitable material, all at the Contractor's expense. No additional payment shall be made in respect of this and all relevant costs shall be deemed to be included in the tendered rates.

All unsuitable material shall be removed prior to importing fill material to such areas.

PSD 5.1 CONSTRUCTION

PSD 5.1.2 PRECAUTIONS

PSD 5.1.2. Existing Services

PSD 5.1.2.2 Detection, location and exposure

Add the following to D 5.1.2.2

If existing services are not shown on the drawings but the existence thereof can be reasonably expected, the Contractor shall, in conjunction with all relevant authorities, determine the exact depth and location of such services before the commencement of construction. After locating the exact position of services, whether indicated on the drawings or not, such services shall be deemed to be known services and the Contractor shall be liable for all costs and subsequent costs arising from the damage thereof as a result of the Contractor's activities. These services must also be indicated on the "as built" drawings.

PSD 5.1.2.3 Protection of cables

Substitute "estimated position" in the second sentence of D5.1.2.3 with "actual or exposed position"

PSD 5.1.3 Precautions Against Windblown Sand and Dust

Add the following subclause to 5.1

The Contractor shall execute the work in such a manner as to minimise the problem of windblown sand originating from within the site. He will remain totally responsible for dealing with this potential problem on all clearing, earthwork and trenching operations.

The Engineer shall be entitled to instruct the Contractor to undertake precautionary measures such as watering, stabilising or operating in smaller areas without the Contractor having recourse to extra compensation. Any costs due to this shall be deemed included under rates tendered elsewhere.

PSD 5.1.4 Groundwater (Subclause 5.1.3)

Should groundwater be encountered in the trenches or excavations the contractor shall provide, operate and maintain sufficient pumping equipment, well points, pipes and other equipment necessary for the proper execution of the works, the cost of which shall be covered by the rates tendered.

PSD 8 MEASUREMENT AND PAYMENT (SUBCLAUSE 8)

PSD 8.2 Computation of Quantities

PSD 8.3 Scheduled Items

PS D 8.3.8.1 (c): Excavate by hand in soft material to expose servicesUnit: m³

Add the following to D 8.3.8.1(c):

Excavation by hand to expose existing services shall only be measured and paid for if so ordered in writing by the Engineer. After the excavation of trial holes to determine the exact position and depth of existing services, at intervals as required by the Engineer, the excavation to a level of 300 mm above such services shall be measured and paid for as normal excavation, independent of the depth of such excavation. Only excavation within 300 mm of the existing services will be measured and paid for as excavation by hand and then only if ordered in writing by the Engineer.

PSD 8.3.14 Precautions against windblown sand.....Unit : Sum

The tendered sum shall include full compensation for compliance with protective measures in minimising the problems of windblown sand originating from the site.

PSDB EARTHWORKS (PIPE TRENCHES)

PSDB 1.2 General

Variable trenching conditions are expected. It is possible that groundwater conditions in the deep trenches could be problematic to ensure additional precautions in dealing with water.

PSDB 3.5(b) Backfill Materials (Subclause 3.5b)

Add the following to DB 3.5(b):

All pipe trenches underlying road ways shall be backfilled with sand complying with the requirements as specified in PSD1.1.

PSDB 3.6.1 Subbase And Base (Subclause 3.6.1)

Substitute DB 3.6.1 with the following:

Where trenches cross or run adjacent to surfaced roads and paved areas, of which the surfaces are scheduled to be reinstated, the material excavated from the existing base and/or subbase pavement layer(s) shall be set aside and used in the reconstruction of the subbase layer. Where applicable, a new material complying with the requirements of SABS 1200 MF shall be used in the reconstruction of the base layer. Any shortfall in material for the reconstruction of the subbase layer shall be made up by the use of material complying with the requirements of SABS 1200 ME.

PSDB 5.1.2.1 Stormwater, Seepage And Dewatering : Throughout The Works (Subclause 5.1.2.1)

In addition to the Contractor's responsibilities for dealing with water, the Engineer may order the Contractor to place a crushed stone bedding layer (minimum thickness 150 mm) on the trench bottom.

Should the trench bottom conditions remain unstable due to the nature of the soil and the degree of saturation, the Engineer may order the Contractor to install a filter fabric on the trench bottom prior to the provision of the stone layer. The specified bedding material shall then be used to bed the pipe.

The Contractor will only be paid for providing and laying the stone bedding layer and filter fabric after receipt of a written order to do so from the Engineer.

PSDB 5.2 Minimum Base Widths (Subclause 5.2)

A side allowance of 300 mm shall be applicable to pipes of diameter less than 700mm.

PSDB 5.7 Compaction (Subclause 5.7)

PSDB 5.7.1 Areas Not Subject to Traffic Loads (Subclause 5.7.1)

This shall not apply.

PSDB 5.7.2 Areas Subject to Traffic Loads (Subclause 5.7.2)

The provisions of subclause 5.7.2 with regard to compaction of trenches shall be applicable to all trenches. Sand backfilling shall be provided and compacted to 100 percent Modified AASHTO maximum density where trenches cross road ways.

PS DB 5.9: REINSTATEMENT OF SURFACES

PS DB 5.9.4: Bitumen Roads: Subbase and Base

Add the following to DB 5.9.4:

Any additional imported material required for the reinstatement of selected layers, subbase or base shall comply with the requirements of the relevant standardised and/or project specifications.

PSDB 8 MEASUREMENT AND PAYMENT

PSDB 8.3 Scheduled Items

PS DB 8.3.2: Excavation

PSDB8.3.2 Hand Excavation and Backfill Unit : m³

Add the following as subclause DB 8.3.2:

The provisions of DB 8.3.2(b) shall apply for hand excavation.
Payment shall only be made if so ordered by the Engineer.

PS DB 8.3.2 (a): Excavate in materials for trenches, backfill, compact and dispose of surplus Material.....Unit: m

Add the following to D 8.3.2 (a):

The depth of excavation in street reserves and other areas shall be measured from the final finished level to the invert level of the pipe.

The rates for trench excavations for subsoil drains must also include any actions needed to deal with any water in the excavations, as well as loading and transportation of material to a spoil site, spoiling levelling and compacting the material to 90% (100% for sand) of Mod.AASHTO at a spoil site as described in Part C3.3.

The rates shall also provide for the fact that the excavation width in sand will be wider than normal.

In the case of subsoil drains, this rate must allow for the supply of suitable free draining sand from above the geotextile up to 200 mm below the surface level.

PSDB8.3.5 Existing Services That Intersect or Adjoin a Pipe Trench

PSDB8.3.5 a) Services that intersect a trenchUnit: No

Add the following to DB 8.3.5(a)

Existing services with a depth of cover exceeding 300 mm, measured from the bottom of excavation to the top of the existing service shall not be measured and paid for. There will be distinguished between existing erf connection.

The rate shall also allow the following costs:

- I. Sufficient photos have to be taken of existing services and handed over to the Engineer before they are being crossed, if there is a possibility of a difference in opinion over the condition of those services, especially on private property.
- II. If such a service is damaged, it has to be repaired to its original condition or if possible to a standard agreed to in writing with the relevant owner. This agreement has to be approved by the Engineer.
- III. If such a service is removed, it has to be replaced as per original.

PSDB8.3.5 b) Services that adjoin a trenchUnit: No

Add the following to DB 8.3.5 (b)

The unit "number" will only be used for services such as poles and trees.

No payment will be made for overhead services that do not rest directly on the ground except where allowance is made for this in the schedule or quantities.

Existing services that rest directly on the ground e.g. poles, tress, walls and structures and handled in the same way as underground services, but the axis of the service will be determined as follows:

The vertical axis is defined as the nearest side or corner of the existing structure to the excavation, measured at the point where the structure and natural ground level intersect.

The horizon axis will be at the point where the structure and the natural ground level intersect. In this instance, where the excavation falls above the 45° line but within 1, 0 meter horizontally from the structure, the service will also be measured as an adjoining service **approved by the Engineer**.

There will be distinguished between existing trunk services and existing erf connection.

PSDB 8.3.6.1: Reinstate road surfaces, complete with all courses..... Unit: m²

The layerworks to be allowed for under this item are as follows below. The costs of the imported material to be used in terms of PS DB 3.6.1 and PS DB 5.9.4, and for surfacing to be included in this rate are:

For Roads :	Wearing Course	30mm Medium Continuously Graded Asphalt
	Base Course	150mm Natural Gravel (G3) base, compacted to 98% Modified AASHTO
	Subbase	125mm Natural Gravel (G5) base, compacted to 95% Modified AASHTO
	Subgrade	300mm© Selected Subgrade (G7), compacted to 100% if sand or 95% Modified if non-sand
For sidewalks	Wearing Course	60mm Interlocking Concrete Paver
	Base Course	100mm Natural Gravel (G5) base, compacted to 95% Modified AASHTO
	Subgrade	150mm Selected Subgrade (G7), compacted to 100% if sand or 95% Modified if non-sand

Should the layerworks for reinstatement at certain locations be changed, on instruction by the Engineer to suit the existing, the rate will be adjusted accordingly.

PSDB8.3.8 Dealing with Water

The cost of dealing with water as specified in Subclause PSDB5.1.2.1 will be held to have been included in the tendered sums.

2) 19mm stone below pipes.....Unit : m³

Where the use of a layer of crushed stone in the trench bottom has been authorised by the Engineer, it will be measured by volume calculated according to length multiplied by the minimum base width and specified thickness.

The tendered rate shall cover the cost of preparation of the trench bottom to accommodate the layer of stone, the supply and placing of the layer of stone over at least the specified width and all related activities in order to produce a stable platform.

3) Geotextile filter fabricUnit : m²

Where the Engineer has authorised the use of geotextile filter fabric, this shall be measured by area as:

width x nett length

where the width shall be the full or half-width supplied by the manufacturer which conforms closest to (the specified minimum base width + 2 x height of bedding + min. 150mm overlap).

The tendered rate shall include the cost of supply, placing and losses as a result of overlaps and over excavated trench widths.

PSDM EARTHWORKS (ROADS, SUBGRADE)

PSDM 1 SCOPE

PSDM 1.1 General

Where pipelines cross existing gravel or surfaced roads, the work required to reinstate the roads shall comply with this specification.

PSDM 3.1 Classification For Excavation Purposes (Subclause 3.1)

Add the following to DM3.1:

All in situ pavement material shall be classified as soft material for excavation purposes unless in calcareous or ferruginous material described in PSD 3.1.2.

PSDM 3.2 Classification For Placing Purposes (Subclause 3.2)

The contractor shall endeavour to use the in-situ sand and silty sand material for areas within the road subgrade.

Any clayey material will need to be removed and if a shortfall of suitable material is found then material in accordance with DM 3.2.3 will need to be imported from commercial sources.

PSDM 7.3.2 Routine Inspection And Testing (Subclause 7.3.2)

Substitute DM 7.3.2 with the following:

No density shall be less than the specified minimum density for the relevant layer.

The cost of all routine testing done by the Engineer, and of which the results do not comply with the specified minimum requirement for the material, shall be borne by the Contractor and may be subtracted from the monthly payment certificates in the event of non-payment by the Contractor.

The Contractor's attention is drawn to PSA 7.1 and PSA 7.2.

PS DM: EARTHWORKS (ROADS, SUBGRADE)

PS DM 2: INTERPRETATIONS

PS DM 2.3: DEFINITIONS AND ABBREVIATIONS

PS DM 2.3.1: Roadbed

Paved areas shall also be taken as roads. Therefore all references to i.e.: roadbed will refer to work under paved areas.

PS DM 3: MATERIALS

PS DM 3.1: CLASSIFICATION FOR EXCAVATION PURPOSES

Add the following:

Where it is a requirement that labour intensive methods be used, PS D 3.1.2 will apply.

PS DM 3.2: CLASSIFICATION FOR PLACING PURPOSES

PS DM 3.2.3: Selected layer

Replace the contents of this subclause with the following:

"The following requirements shall apply in respect of the selected layer:

(a) Maximum particle size: 60 % of compacted layer thickness

(b) Unstabilised selected layer

(i) Upper selected layer

Minimum CBR at 93 % of modified AASHTO density: 15
Maximum PI: 10

(NOTE: These requirements for the upper selected layer also apply where only one selected layer is specified)

(ii) Lower selected layer

Minimum CBR at 90 % of modified AASHTO density: 7
Maximum PI: 10

(c) Stabilised selected layer

Minimum grading modulus of natural material 0.75
UCS of stabilised material 300 kPa – 500 kPa at 93 % of modified AASHTO density
Maximum PI for stabilised material: 10

PS DM 5: CONSTRUCTION

PS DM 5.2: METHODS AND PROCEDURES

PS DM 5.2.2: Cut and borrow

PS DM 5.2.2.2: Dimensions of cuts

Substitute "subbase" in the second paragraph of DM 5.2.2.2 with "subbase or selected layer, whichever may be applicable" and

Substitute "CBR of at least 7" with "CBR as applicable according to the provisions of PS DM 3.2.3".

Add the following paragraph:

"The cost for shaping cuttings to the required levels and tolerances will be deemed to be included in the relevant pay items. No separate payment will be made for any operation the contractor may require to meet the required level and tolerance."

PS DM 5.2.2.3 (b): Cut to spoil

Substitute DM 5.2.2.3 (b) with the following:

All surplus and/or unsuitable material shall be removed from the site and disposed of at the spoil site (as described in PS D 5.2.2.3) and shall be shaped to establish a free draining surface and compacted to 90% MOD AASHTO (100% for sand).

PS DM 5.2.2.4: Temporary stockpiling of materials

Add the following to DM 5.2.2.4:

The Contractor shall program the works in such a manner that suitable excavated material shall, if practically possible, be placed directly in the appropriate position to ensure that temporary stockpiling is limited to an absolute minimum. No payment shall be made for the temporary stockpiling of material where such material is to be used for backfilling of pipe trenches, except when so ordered in writing by the Engineer.

PS DM 5.2.3.3: Treatment of road bed

- a) Preparation and compaction of road bed.

Substitute the first paragraph of DM 5.2.3.3 (a) with the following:

The road-bed shall be scarified to a depth of 150 mm, shaped and compacted to 93% of Mod.AASHTO density (100% for sand), except where otherwise ordered by the Engineer.

Any portion of the road-bed that lies within the selected layers and that, with the exception of its density, complies with the requirements of selected layer material, shall be scarified to the necessary depth, watered and compacted to 93% of mod AASHTO density (100% for sand) over the specified depth for selected layers.

PS DM 5.2.4.3: Finishing

- (e) Topsoiling

Replace the second sentence with the following:

"The thickness of the topsoil shall be as directed by the Engineer".

PS DM 5.2.5: Selected layer

Replace the contents of this subclause with the following:

"Except with regard to density, the requirements of Subclause 5.2.4 shall apply. The degree of compaction shall be:

Selected layer: 93 % of modified AASHTO density, except where otherwise ordered by the Engineer.

If material is cohesionless, the compaction shall be 100 % of modified AASHTO density. (ie in sand)

Add the following to DM 5.2.5:

Where the quality of the in-situ material that lies within the selected layers complies with the requirements of selected layer material, these areas will be treated as described in PS DM 5.2.3.3 (Treatment of road-bed).

To determine the suitability of in-situ material for selected layers, the Engineer may order the Contractor to dig test holes with maximum dimensions of 1.5 m x 1.5 m and 1.0 m deep at positions

indicated by the Engineer and to have tests conducted, before construction commences. The Contractor must allow for this in his programming of works. The Contractor shall backfill all test holes with selected material and compact it to 95% of Mod.AASHTO density (100% for sand), after the Engineer has taken samples and profiled the holes.

PS DM 5.2.6: Gravel surfacing

Replace the third sentences of this subclause with the following:

“The relevant requirements in subclause 5.2.4.2 shall apply, except that the material shall be compacted to 93 % of modified AASHTO density.

PS DM 6: TOLERANCES

PS DM 6.5: DIMENSIONS AND LEVEL CONTROL

The Contractor shall submit to the Engineer, in a form acceptable to the Engineer, records of dimensions and level control, prior to requesting the Engineer to carry out any routine inspections.

PS DM 7: TESTING

PS DM 7.3: ROUTINE INSPECTION AND TESTING

Substitute DM 7.3.2 with the following:

No density shall be less than the specified minimum density for the relevant layer.

The cost of all routine testing done by the Engineer, and of which the results do not comply with the specified minimum requirement for the material, shall be borne by the Contractor and will be subtracted from the monthly payment certificates.

PSDM 8.2.5: Verifying quantities

Replace the first sentence with the following:

"Before any earthworks are commenced but after completion of any site preparation, the engineer will upon a written request from the contractor provide cross-sections for the purpose of measurement of earthworks quantities."

PS DM 8.2.7: Excavation widths

For the measurement of quantities the excavation width will be measured from 200 mm behind the rear of the precast kerb. The total width therefore is the sum of the blacktop width, the plan measurement of the kerb/channel plus 400 mm. In the case of gravel roads the excavation width will be measured from the specified edge of the gravel layer. No additional payments will be made for wider excavations.

PS DM 8.3: SCHEDULED ITEMS

PSDM 8.3.17 Trim, prepare and compact verges..... Unit: m²

The area to be trimmed shall be the unsurfaced area from the back side of the kerbs to the boundary of the road reserve, or such wider area necessitated by the road prism.

The rate shall cover the cost of trimming and shaping the verges to the lines, levels and dimensions as shown on the drawings, of acquiring additional material to compensate for any material lost due to weather or other reasons, and of the compaction of any loose or disturbed material to 93% Mod. AASHTO density (100% for sand). It shall only be paid if specifically requested by the Engineer as part of preparatory work for landscaping.

PSLB BEDDING (PIPES)

PSLB 3.1 Selected Granular Material (Subclause 3.1)

Add to subclause 3.1:

Sand as specified in subclause PSD 1 of this Project Specification shall be considered as suitable for use in the pipe bedding cradle.

PSLB 3.3 Class Of Bedding (Subclause 3.3)

Add the following to LB 3.3:

Concrete and GRP pipes shall be classified as rigid pipes and shall be laid on a Class C bedding whilst uPVC, HDPE and steel pipes shall be classified as flexible and bedded in accordance with drawing LB 3 (d) of SABS 1200 LB.

Where conditions are poor (such as under waterlogged trenches) the Engineer may instruct that the trench bottom is treated in accordance with PSDB 5.1.2.1

Pipe bedding and blanket material will need to be imported from commercial sources as sufficient local source material is unlikely.

Ballast Stone to be used for bedding below rectangular culverts shall comply to the following requirements:

- Los Angeles Abrasion value determined in accordance with ASTM C 131 – 89 grading B shall not exceed 22%
- The plasticity index on the fines developed from the abrasion test shall be less than 6
- Flakiness Index measured in accordance with SABS 1083 shall not exceed 30%
- Voids measured in accordance with SABS 1083 shall not be less than 40%
- The relative density shall not be less than 2.5
- Rock size to have a range between 30mm and 100mm

PSLB 5.1.4 Compacting (Subclause 5.1.4)

Substitute “90% of Mod AASHTO” in LB 5.1.4 with “93% of Mod AASHTO (100% for sand)”.

PSLB 8 MEASUREMENT AND PAYMENT

PSLB 8.2 Scheduled Items (Subclause 8.2)

PSLB 8.2.1 Provision of Bedding from Trench Excavation.....Unit : m³

Notwithstanding the fact that some suitable bedding and cradle material may be available from the trenches, the provision of bedding will be measured as a separate item in terms of SABS 1200LB subclause 8.2.1.

PSLE STORMWATER DRAINAGE

PSLE 3.1 CULVERT UNITS AND PIPES

PSLE 3.1(a) Precast Concrete Pipes

Pipes shall be precast concrete with Spigot and Socketed joints to SABS 677 unless otherwise specified.

The Contractor shall not close up a trench until the Engineer or his representative has inspected the joints and confirmed the approval in writing. The contractor shall take this into account when pricing this pipe.

PSLE 3.4.2 PREFABRICATED CHAMBERS AND SHAFTS (SUBCLAUSE 3.4.2)

Brick manholes may be used for depths up to 2,0 m as an alternative to precast concrete manholes. The maximum length of the shaft shall be 600mm.

HDPE pre-fabricated manholes, where specified on drawings, may not be replaced with alternative type manhole.

PSLE 3.4.3 Manhole Covers and Frames

Add to 3.4.3:

All covers and frames to be Heavy Duty ductile iron with hinged cover in compliance with SANS 50124 Class-D400 if formally agreed with the Local Authority. The covers and frames shall be heavy duty (SANS Type 2A) in trafficked areas, otherwise medium duty (SANS Type 4A).

Security lock option preventing unauthorised entry is to be used.

PS LE 3.5: GEOFABRIC BLANKET

Replace LE 3.5 with the following:

The geotextile blanket shall be made of a polymer material, which has been processed to achieve a homogeneous permeability. A geotextile blanket made from polyamide is not acceptable as this material is sensitive to varying temperatures and moisture absorption.

PS LE 3.6: SUBSURFACE DRAINS

PS LE 3.6.1: Pipes

Pipes for subsurface drains shall be HDPE pipes complying with the requirements of SANS ISO 4427 and shall be perforated or slotted. Fittings shall be heavy duty and shall also comply with SANS ISO 4427.

Perforations shall be spaced in two rows for 110 mm pipes and in three rows for 160 mm pipes. The arrangement of perforations and slots shall be subject to the Engineer's approval.

Pipes without slots or perforations required for conveying ground water from the subsoil drainage proper to the point of discharge, shall be unperforated HDPE pipes. "Core-drain" pipes will not be accepted.

PS LE 3.6.2: Geotextile blanket

All Geotextile blanket around subsurface drains shall comply with the requirements of PS LE 3.5.

PS LE 3.6.3: Crushed stone

Crushed stone in subsurface drains shall be 19 mm nominal size stone complying with the grading requirements of SABS 1083.

PS LE 3.6.4: Sand backfilling

Sand for backfilling subsurface drains shall be clean, hard, free-draining sand from approved borrow pits.

PSLE 5.5.4 Finished Level of Manhole Covers

The final finished level of the manhole covers shall be:

- a) flush with hard surfaced roadway or hard surface sidewalk, or
- b) 30mm above final grassed levels, or
- c) 50mm above ground level for midblock sewers, or
- d) 100mm above final ground level in the veld.

If a manhole is positioned at a low point or in a hollow where stormwater infiltration may occur, the manhole cover level must be raised to a level to avoid the danger of infiltration, or to a level as agreed with the Engineer.

PSLE 5.1.3 UNSUITABLE FOUNDATIONS CONDITIONS

Substitute "90% of Mod AASHTO maximum density" in LE 5.1.3 with "93% of Mod. AASHTO maximum density (100% for sand)"

PSLE6.3.1 LOCATION

Add to 6.3.1:

Referring to the tolerance above (1200 LE 6.3.1), the location should minimize the need to cut pipes.

PSLE 8.2 SCHEDULED ITEMS

PSLE 8.2.2.1 Bedding

The provision of material used for bedding of rectangular sections shall comply with the requirements of SABS LB.

PSLE 8.2.8 Manholes

Depth of manholes shall be defined as the distance from the top of the ductile iron cover to the lowest invert level of the manhole

PS LE 8.2.14: Supply and install subsurface drains according to drawingsUnit: m

The length shall be measured on the centre line of the completed subsurface drain.

The rate shall cover the cost of supplying, transporting, off-loading and installing all materials, including perforated pipes, crushed stone and geotextile blanket, as well as for cutting, wasting, overlapping and installing of the materials where applicable.

PS LE 8.2.15: Connecting subsurface drains to manholes, kerb inlets, etc.Unit: no

The number is the number of subsurface drainpipes built in at manholes or kerb inlets.

The rate shall cover the cost of all labour, plant and materials necessary to connect the subsurface drain to manholes and/or kerb inlets, and making the structure watertight, all as shown on the drawings.

PSG CONCRETE (STRUCTURAL)

PSG 3: MATERIAL

PSG 3.2: CEMENT

PSG 3.2.2: Alternative types of cement

Replace the contents of the subclause with the following:

"Only approved cement from a recognised supplier in the industry will be accepted. Should the contractor wish to use any other type of cement, he shall obtain the Engineer's prior written approval (see 8.1.3.2 and 8.1.3.3)".

PSG 3.2.3: Storage of cement

Cement shall not be kept in storage for more than 10 weeks without the Engineer's permission.

PSG 3.4.3: Storage of aggregates

Where aggregates of differing chloride content are stockpiled on the site, strict control shall be exercised over their use for differing classes of concrete.

PSG 3.4: AGGREGATES

PSG 3.4.1: Aggregate Specification

Add the following to PS G3.4.1:

The fineness modulus of the sand must be between 1.7 and 2.8 with a standard deviation of not more than 0.1.

PSG 3.4.4: Alkali-aggregate reaction

Malmesbury hornfels (shale) shall not be used in conjunction with high alkali cement in concrete in any part of the Works. For the purposes of this clause, a high alkali cement is one in which the equivalent alkali content ($\text{Na}_2\text{O} + 0.658 \text{ K}_2\text{O}$) exceeds 0.60 % by mass of the cement.

In order to ensure that the above requirement is met, the Contractor may elect to use an aggregate other than Malmesbury hornfels, that complies with the requirements of SABS 1083. Alternatively, if the Contractor chooses to use Malmesbury hornfels, he shall comply with the following requirements regarding the cement:

- a) Before commencing any particular section of the structure, the Contractor shall ensure that he has enough cement that is not a high alkali cement to complete the section.
- b) Certificates stating the alkali content of each delivery of cement to the Site shall be supplied by the Contractor. These certificates shall be based on tests carried out at a laboratory approved by the Engineer. The cost of testing, including sampling, transporting of samples, and issuing of certificates, shall be borne by the Contractor.
- c) The Contractor shall be entitled to use an approved brand of cement as a means for ensuring that the permissible alkali content is not exceeded. The Contractor shall make allowance for the higher price of such approved brand, if he chooses to use this method.
- d) High alkali cement delivered to the Site shall be rejected, and the cost of its removal and replacement with cement with acceptable alkali content shall be borne by the Contractor.

PSME: SUBBASE

PS ME 3: MATERIALS

PS ME 3.2: PHYSICAL PROPERTIES

PS ME 3.2.1: Subbase Material (G5 quality according to TRH 14)

Substitute the requirements for unstabilized subbase in ME 3.2.1 with the following;

Materials for use in the unstabilized subbase shall comply with the following requirements:

i) Maximum size of aggregate after compaction	63 mm
ii) Maximum liquid limit	30
iii) Maximum plasticity index (PI)	10+ (3 x GM)
iv) Minimum PI	6
v) Maximum linear shrinkage	5%
vi) Minimum CBR at 95% of Mod.AASHTO density	45
vii) Maximum CBR swell at 100 % of Mod.AASHTO density	0.5%
viii) Maximum group index	0
ix) Minimum grading modulus (GM)	1.5
x) Maximum particle dimension of gravel	≤40 mm

PS ME 5.4: PLACING AND COMPACTION

PS ME 5.4.4.3: Penetration

Add the following new sub-clause:

The Contractor must provide for the penetration of the subbase material in the selected layer. The specified layer thickness will be a net homogenous layer. Only the homogenous layer will be measured for payment.

PS ME 5.7: Transport

PS ME 5.7.1: Freehaul

Substitute ME 5.7.1 with the following:

An unlimited freehaul distance shall apply to subbase material.

PS ME 7: TESTING

PS ME 7.2: PROCESS CONTROL AND ROUTINE INSPECTION AND TESTING

PS ME 7.2.1: Process control

Substitute the second sentence of ME 7.2.2 with the following:

No density shall be less than the specified minimum density for the relevant layer.

PS ME 8: MEASUREMENT AND PAYMENT

PS ME 8.1: BASIC PRINCIPLES

Insert a semi-colon in the first line of paragraph (b) after the words ".... will be paid for once only" and delete the rest of the paragraph.

Replace paragraph (d) with the following:

(d) that in the case of material from a commercial source or from borrow pits selected by the contractor, no additional payment will be made for the class of excavation, method of processing (except stabilizing), or overhaul unless otherwise specified in the project specification.

PS ME 8.2: COMPUTATION OF QUANTITIES

Substitute ME 8.2 with the following:

Measurement and payment shall be to the exact dimensions as shown on the drawings.

PS ME 8.3.11 Rework Subbase.....Unit: m³

The rate shall cover the cost of scarifying and re-working, watering, compacting, final grading and testing after completion of the building construction in the various phased construction any additional subbase required will be measured under SABS 1200 ME 8.3.3.

PSMJ SEGMENTED PAVING

PSMJ 3.1.2 CLASS, STRENGTH AND TYPE

Concrete paving bricks shall conform to the following:

- 1) Colour to architects requirements
- 2) 50mm thick in parking areas and pedestrian areas, 70mm in roadways
- 3) Pattern to architects detail.
- 4) Class 35 for 70mm paver, Class 35 for 50mm paver – strength based on day of dispatch to site and not on a forecast 28 day strength (ie full strength achieved by the time delivered to site).
- 5) Compliance with SANS 1058: Concrete paving blocks
- 6) Fully interlocking (Type S-A) for roads and parking, Type S-C for pedestrian areas

Clay bricks if required in roadway, parking areas or pedestrian sidewalks shall be:

- 1) Laid according to the existing colour pattern and type
- 2) 80mm thick in trafficked areas, to architects requirements in pedestrian areas.
- 3) Comply with the applicable requirements of SABS 1575 : Burnt Clay Paving Units.
- 4) PA classification (Table 1 SABS 1575) ie Modulus of Rupture greater than 4.0 MPA and Expansion due to moisture less than 0.25%. Note the testing requirements in PSMJ 7.4

PSMJ 3.3 BEDDING AND JOINTING SAND

Bedding sand shall be washed to remove soluble salts and shall conform to the grading in MJ 3.3(a). Bedding sand shall be totally non plastic.

Jointing sand shall be finer than the bedding sand and shall be in accordance with MJ 3.3(b). Jointing sand may have a very slight PI.

PSMJ 5.4 LAYING OF UNITS

Add the following to PSMJ 5.4:

Units will be laid generally in herringbone pattern at 45 degrees to the main direction of traffic where the architect has no pattern preference. The architect will indicate patterns in all areas, and patterns **must** be clarified before laying commences.

PSMJ 5.7 JOINT FILLING

It may be necessary to refill the paving joints approximately 3 months after the initial completion of the paving. The contractor should be aware of this and take precautions to prevent extensive areas of requiring this treatment. The paving will be monitored and should the washing out and erosion of the jointing sand be significant the engineer will instruct the contractor to refill the joints.

The Engineer may instruct the contractor to use a product such as “Eco binder” or similar to prevent joint erosion. This will need to be clarified.

PSMJ 5.8 EXPANSION JOINTS (CLAY BRICK PAVING ONLY)

Expansion joints will only be made specifically against fixed structure or elsewhere that the Engineer instructs.

The width of any expansion joints shall be 10mm (minimum) and must extend through the full depth of the paving brick. The open joint shall be filled with a "Jointex" or similar approved product and the top 10mm of the joint sealed with an approved sealing compound such as polysulphide or similar.

The final drawings will indicate the locations of expansion joints which shall coincide with bands in the paving or edge restraints. It will be the contractor's responsibility to ensure that the expansion joints do not detract from the aesthetics of the paving. The engineer or landscape architect shall have the right to condemn areas of paving where the correct location of expansion joints have not been followed.

PSMJ 7.4 TESTING OF BRICKS / BLOCKS

- 1) Concrete interlocking blocks are to be tested for the properties described in SANS 1058.
- 2) Clay bricks are to be tested by the contractor for properties described in SANS 1575.

In accordance with SANS 1575 the following tests are required.

- a) Dimensions and warpage measurement – 10 bricks
- b) Modulus of Rupture – 5 bricks
- c) Moisture expansion test – 4 bricks.
- 3) The results of all tests are to be submitted to the engineer prior to commencement of any paving.

These tests shall be included in the contractor's rates for paving.

PSMJ 8.2 SCHEDULED ITEMS

Add the following:

PSMJ 8.2.2 Construction of paving complete Unit : m²

Add the following:

This items shall also cover any additional costs caused by the necessity of having to order the bricks early. It shall also cover any temporary storage of these bricks complete with security arrangements.

PSMJ 8.2.6 Expansion joints (clay bricks)..... Unit : m

The rate shall cover the cost of supplying all material necessary and constructing the expansion joint complete in all respects. It shall also cover any consequential implications on the progress of the overall paving.

PSMK: KERBING AND CHANNELLING

PS MK 3: MATERIALS

PS MK 3.1: CONCRETE

Add the following:

"The Contractor shall timeously submit the concrete mix design for cast-in-situ kerbing to the Engineer for approval and no kerbing shall be placed before the mix design has been approved."

PS MK 3.2: PRECAST KERBING AND CHANNELLING

PS MK 3.2.3: Strength

Substitute MK 3.2.3 with the following:

Precast kerbs, edging and channels shall be of grade 25 MPa/19 mm concrete.

PS MK 3.9: BEDDING MATERIAL

Substitute MK 3.9 with the following:

The material on which concrete kerbs, channels and edging are bedded, shall be in accordance with the dimensions shown on the drawings and shall consist of a 15 mPa concrete mix with a 6.7 mm single size coarse aggregate.

PS MK 5: CONSTRUCTION

PS MK 5.1: EXCAVATION AND BEDDING

Substitute "90%" in MK 5.1 with "93% (100% for sand)".

PS MK 5.2: PRECAST CONCRETE KERBING AND CHANNELLING

Substitute the first sentence of MK 5.2 with the following:

Precast concrete kerbing and channelling shall be laid and bedded on a concrete bedding complying with the requirements of PS MK 3.9 and to the dimensions shown on the drawings.

PS MK 5.10: PROTECTION

Substitute the word "bad" in the second sentence with the following:

"no chipped or patched kerbs will be accepted"

PS MK 5.11: TRANSITION SECTIONS AND INLET AND OUTLET STRUCTURES

Substitute the first sentence of the second paragraph of MK 5.11 with the following:

Inlet and outlet structures shall be in accordance with the details shown on the drawings.

PS MK 5.14: EXPANSION JOINTS

These joints shall be provided at 10 m intervals. These joints shall be 12 mm wide, filled with a compound such as flexcell or similar product and sealed with a polysulphide sealant. Costs of furnishing the materials and construction of the joint are deemed to be included in the laying rate."

PS MK 8: MEASUREMENT AND PAYMENT

PS MK 8.1: BASIC PRINCIPLES

Add the following to MK 8.1.1:

Payment shall include the provision of expansion joints as specified.

PS MK 8.2: SCHEDULED ITEMS

PS MK 8.2.1: Re-use concrete kerbing and channels from stockpile.....Unit: m

Add the following to MK 8.2.1(b):

The tendered rate includes the supply, from site within freehaul distance, and placing of kerbs or channels in accordance with 8.2.1

PSMM: ANCILLARY ROADWORKS

PS MM 3: MATERIALS

PS MM 3.2: ROAD SIGNS

PS MM 3.2.1: General

Add the following to MM 3.2.1:

All road signs and road markings shall be in accordance with the SA Road Traffic Signs Manual and as shown on the drawings.

No special breakaway devices are required.

PS MM 3.2.2: Structural steel

Substitute the second paragraph of MM 3.2.2 with the following:

All structural steel, including steel tubes, shall have a hot-dip (galvanized) zinc coating that complies with the requirements of SABS 763 for coatings of type A1 or B1 articles, as applicable.

PS MM 3.2.8: Paint and protective coatings

PS MM 3.2.8.1: Structural steel sign supports and sign face frames

Replace the contents of this subclause with the following:

"The sign supports and the backs of all road sign faces shall be painted grey. The colour code of the paint shall be code No 36 according to the CKS 279 classification.

Newly galvanised surfaces shall be thoroughly scrubbed down with an approved galvanised iron cleaner to remove all traces of the resinous protective coating. The surface shall be washed down and scrubbed to remove all traces of grease, oil, dirt, etc. Two coats of calcium plumbate primer shall be applied to a dry film thickness of not less than 0.028 mm. The undercoat shall follow within one week of the primer."

PS MM 5: CONSTRUCTION

PS MM 5.2: ROAD SIGNS

PS MM 5.2.1.6: Galvanizing

Substitute the second paragraph of MM 5.2.1.6 with the following:

Galvanized mild steel support for road signs shall be painted in accordance with PS MM 5.2.2.4.

PS MM 5.2.2: Painting

PS MM 5.2.2.4: Painting of structural steelwork

The provisions of MM 5.2.2.4 shall apply *mutatis mutandis* to the painting of galvanized surfaces, except for the following:

a) Surface preparation

Galvanized surfaces shall be thoroughly scrubbed down using an approved galvanized iron cleaning agent to remove all traces of the resin protective coating.

The surface shall be washed down and scrubbed to remove all traces of grease, oil, dirt, etc;

b) Priming

Two coats of calcium plumate primer shall be applied to a dry film thickness of at least 25 microns. The undercoat shall follow within one week after the priming.

c) Finishing coat

The colour of the finishing coat shall be dark grey, as specified in MM 3.2.8.2.

PS MM 5.3.2: Surface Preparation

Substitute "48 h" in MM 5.3.2 with "7 days (168 h)".

PS MM 8.4.5: Sandblasting of redundant line markings.....Unit: m²

The tendered rate shall include full compensation for the necessary equipment, labour and materials, for any specific protective measures, and cleaning of the area of all residual dust.

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

C3.3.6 Particular Specifications

The following particular Specifications are attached and shall apply to this contract.

PART A : Environmental Management Specification

PART B : Occupational Health & Safety Specification

PART C : Works Particular Specification

PART A : Environmental Management Specification

PEM PARTICULAR SPECIFICATION: ENVIRONMENTAL MANAGEMENT

1 SCOPE

This Specification covers the requirements for controlling the impact of construction activities on the environment.

2 INTERPRETATIONS

2.1 Supporting Specifications

Where this Specification is required for a project the following specifications shall, inter alia, form part of the Contract Document.

- (a) Project Specification;
- (b) SABS 1200 A or SABS 1200 AA, as applicable;

2.2 Application

This Specification contains clauses that are generally applicable to the undertaking of civil engineering works in areas where it is necessary to impose pro-active controls on the extent to which the construction activities impact on the environment. Interpretations and variations of this Specification are set out in Portion 2 of the Project Specification (see 2.1).

In the event of any difference or discrepancy between the provisions of the Standardized Specifications and the provisions of this Specification, the latter shall prevail.

2.3 Definitions.

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

Environment means the surroundings within which humans exist and that are made up of:

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

Potentially hazardous substance is a substance that, in the reasonable opinion of the Engineer, can have a deleterious effect on the environment.

Method Statement: a written submission by the Contractor to the Engineer in response to the Specification or a request by the Engineer, setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer when requesting the Method Statement, in such detail that the Engineer is enabled to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications.

The Method Statement shall cover applicable details with regard to:

- construction procedures,
- materials and equipment to be used,
- getting the equipment to and from site,
- how the equipment/ material will be moved while on site,
- how and where material will be stored,

- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur,
- timing and location of activities,
- compliance/ non-compliance with the Specifications and
- any other information deemed necessary by the Engineer.

reasonable means, unless the context indicates otherwise, reasonable in the opinion of the Engineer after he has consulted with a person, not an employee of the Employer, suitably experienced in "environmental implementation plans" and "environmental management plans" (both as defined in Act No 107,1998).

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

Contract means the General Conditions of Contract and Special Conditions, Specifications, Drawings, Tender, written records of matters agreed after the submission of the Contractor's tender, Letter of Acceptance and Agreement, together with other documents which the parties have agreed in writing shall form part of the Contract and such amendments or additions to the Contract as may be agreed in writing between the parties.

Contaminated water means water contaminated by the Contractor's activities, e.g. concrete water and runoff from plant/ personnel wash areas.

Top material means the top 150 mm of soil (topsoil) and root material of cleared vegetation.

3 MATERIALS

3.1 Materials handling, use and storage

The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the Specifications. The Contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the Specifications.

Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

All manufactured and/ or imported material shall be stored within the Contractor's camp, and, if so required by the Project Specification, out of the rain. All lay down areas outside of the construction camp shall be subject to the Engineer's approval, which shall not unreasonably be withheld.

3.2 Hazardous substances

Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. The relevant Material Safety Data Sheets (MSDS) shall be available on Site. Procedures detailed in the MSDSs shall be followed in the event of an emergency situation.

Petroleum, chemicals, harmful and hazardous waste is to be stored in an enclosed and bunded area. This area shall be subject to the approval of the Engineer. The waste shall be disposed of at a hazardous waste disposal site as approved by the Engineer. Storage and disposal of waste is regulated through other legislation, which should be complied with *i.e.* the Occupational Health and Safety Act.

3.2.1 Shutter oil and curing compound

Shutter oil and curing compound pose a risk of causing water and soil contamination and accordingly are regarded as potential hazardous substances. The Contractor shall ensure that shutter oil and curing compound containers in use are stored within the fuel bund. The remaining

containers shall be inspected regularly to ensure that no leakage occurs. When shutter oil or curing compound is dispensed, the proper dispensing equipment shall be used, and the storage container shall not be tipped in order to dispense the oil/ compound. The dispensing mechanism of the shutter oil/ curing compound storage container shall be stored in a waterproof container when not in use.

Shutter oil and curing shall be used in moderation and shall be applied under controlled conditions using appropriate equipment. The Contractor shall take all reasonable precautions to prevent accidental and incidental spillage during the application of these compounds.

In the event of shutter oil or curing compound spill, the source of the spillage shall be isolated, and the spillage contained. The Contractor shall clean up the spill, either by removing the contaminated soil or by the application of absorbent material in the event of a larger spill. Treatment and remediation of the spill area shall be undertaken to the reasonable satisfaction of the Engineer.

3.2.2 Bitumen

The Engineer shall be advised of the area that the Contractor intends using for the storage of bitumen drums/ products. The storage area shall have a smooth impermeable (concrete or 250 µm plastic covered in sand) floor. The floor shall be bunded and sloped towards a sump to contain any spillages of substances. The bund shall be inspected and emptied daily, and serviced when necessary. The bund shall be closely monitored during rain events to ensure that it does not overflow.

4. PLANT

4.1 Ablution facilities

A sufficient number of chemical toilets shall be provided by the contractor in the construction camp area and at appropriate locations approved by the Engineer. The ratio of ablution facilities to site staff should not exceed 1:20 and facilities shall be located within 100m from any point of work but no closer than 50 m to any water body or river. All temporary/ portable toilets shall be secured to the ground to prevent them from toppling due to wind or any other cause.

The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are properly stored and removed from Site. Discharge of waste from toilets into the environment and burial of waste is strictly prohibited.

Washing, whether of the person or of personal effects and acts of excretion and urination are strictly prohibited other than at the facilities provided.

4.2 Eating areas

The Contractor shall designate eating areas at each area of the site where work is taking place. All permanent eating areas are to be covered in accordance with the requirements of the Occupational Health and Safety Act. The Contractor shall ensure that his employees do not consume meals anywhere other than within these eating areas.

4.3 Solid waste management

The Contractor shall provide sufficient bins with lids on Site to store the solid waste produced on a daily basis. Solid, non-hazardous waste shall be disposed of in the bins provided and no on-site burying, dumping or burning of any waste materials, vegetation, litter or refuse shall occur. Bins shall not be allowed to become overfull and shall be emptied a minimum of once daily. The waste may be temporarily stored on Site in a central waste area that is weatherproof and scavenger-proof, and which the Engineer has approved.

All solid waste shall be disposed of off site at an approved landfill site. The Contractor shall supply the Engineer with a certificate of disposal.

4.4 Contaminated water

The Contractor shall set up a contaminated water management system, which shall include collection facilities to be used to prevent pollution, as well as suitable methods of disposal of contaminated water. The Contractor shall prevent the discharge of water contaminated with any pollutants, such as soaps, detergent, cements, concrete, lime, chemicals, glues, solvents, paints and fuels, into the environment.

The Contractor shall notify the Engineer immediately of any pollution incidents on Site. The Engineer's approval will be required prior to the discharge of contaminated water to the Municipal sewer system.

4.5 Site structures

All site establishment components (as well as equipment) shall be positioned to limit visual intrusion on neighbours and the size of area disturbed. The type and colour of roofing and cladding materials to the Contractor's temporary structures shall be selected to reduce reflection.

4.6 Noise control

The Contractor's attention is drawn to the applicable regulations framed under the Machinery and Occupational Safety Act, 1983 (Act No. 6 of 1983). The provisions of SABS 1200A Subclause 4.1 regarding "built-up areas" shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas.

Appropriate directional and intensity settings are to be maintained on all hooters and sirens, and the Contractor shall provide and use suitable and effective silencing devices for pneumatic tools and other plant such that the noise level in inhabited areas and dwellings adjacent to the work areas will not increase by more than 7 dB (A)_{Leq 60} above residual background sound levels. Similarly in habituated areas adjacent to access roads maximum noise levels shall not exceed 60 dB(A)_{Leq 60} and maximum sound pressure level of 70 dB(A).

Where excess noise generation is unavoidable, the Contractor shall, by means of barriers, effectively isolate the source of any such noise in order to comply with the said regulations. The Contractor shall restrict any of his operations that may result in undue noise disturbance to those communities and dwellings abutting the Site to the hours of 08:00 to 17:00 on weekdays and Saturdays. No work will be permitted on Sundays unless otherwise agreed to with the Engineer.

No amplified music shall be allowed on Site. The use of radios, tape recorders, compact disc players, television sets etc shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on members of the public within range. The Contractor shall not use sound amplification equipment on Site unless in emergency situations.

4.7 Lights

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

4.8 Fuel (petrol and diesel) and oil

Unless otherwise specified in the Project Specification, fuel may be stored on site in an area approved by the Engineer. The Contractor shall ensure that all liquid fuels (petrol and diesel) are stored in tanks with lids, which are kept firmly shut or in bowzers. The tanks/ bowzers shall be situated on a smooth impermeable surface (concrete or 250 µm plastic) with an earth bund (plastic must have a 5 cm layer of sand on top to prevent damage and perishing). The impermeable lining shall extend to the crest of the bund and the volume inside the bund shall be 130% of the total capacity of all the storage tanks/ bowzers. The bunded area shall be covered to protect it from rain. Provision shall be made for refuelling at the fuel storage area, by protecting the soil with 250 µm plastic covered with a minimum of a 5 cm layer of sand.

If fuel is dispensed from 200 litre drums, only empty externally clean drums may be stored on the bare ground. All empty externally dirty drums shall be stored on an area where the ground has been protected. The proper dispensing equipment shall be used, and the drum shall not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage drum shall be stored in a waterproof container when not in use.

The Contractor shall prevent unauthorised access into the fuel storage area. No smoking shall be allowed within the vicinity of the fuel storage area. The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel stores.

Where reasonably practical, plant shall be refuelled at the fuel storage area or at the workshop as applicable. If it is not reasonably practical then the surface under the refuelling area shall be protected against pollution to the reasonable satisfaction of the Engineer prior to any refuelling activities. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200 l of hydrocarbon liquid spill. This material must be approved by the Engineer prior to any refuelling or maintenance activities.

4.9 Workshop, equipment maintenance and storage

All vehicles and equipment shall be kept in good working order. Leaking equipment shall be repaired immediately or removed from the Site. Where practical, all maintenance of equipment and vehicles on Site shall be performed off Site or in the workshop. If it is necessary to do maintenance outside of the workshop area, the Contractor shall obtain the approval of the Engineer prior to commencing activities. The Contractor shall ensure that in his workshop and other plant maintenance facilities, including those areas where, after obtaining the Engineer's approval, the Contractor carries out emergency plant maintenance, there is no contamination of the soil or vegetation. The workshop shall have a smooth impermeable (concrete or 250 µm plastic covered with sand) floor. The floor shall be bunded and sloped towards an oil trap or sump to contain any spillages of substances (e.g. oil).

When servicing equipment on site, drip trays shall be used to collect the waste oil and other lubricants. Drip trays shall also be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles). Drip trays shall be inspected and emptied daily. Drip trays shall be closely monitored during rain events to ensure that they do not overflow. Where practical, the Contractor shall ensure that equipment is covered so that rainwater is excluded from the drip trays.

The washing of equipment shall be restricted to urgent or preventative maintenance requirements only. All washing shall be undertaken off Site or in the workshop. The use of detergents for washing shall be restricted to low phosphate and nitrate containing, low sudsing-type detergents.

4.10 Dust

The Contractor shall take all reasonable measures to minimise the generation of dust as a result of construction activities to the satisfaction of the Engineer. The Contractor's dust management planning should, as a minimum, take cognisance of the following:

- Schedule of spraying water on unpaved roads paying due attention to control of runoff.
- Speed limits for vehicles on unpaved roads and minimisation of haul distances.
- Measures to ensure that material loads are properly covered during transportation.
- Schedule for wheel cleaning and measures to clean up public roads that may be soiled by construction vehicles.
- Minimisation of the areas disturbed at any one time and protection of exposed soil against wind erosion, e.g. by dampening with water or covering with straw
- Location and treatment of material stockpiles taking into consideration prevailing wind directions and location of sensitive receptors.
- Controlled blasting techniques to minimise dust and fly rock during blasting.
- Adherence to the dust loads and protective gear stipulated in the Occupational Health and Safety Act.
- Reporting mechanism and action plan in case of excessive wind and dust conditions.

During Summer, a water tanker should be permanently available for the control of dust generation, and the Contractor shall ensure that the sprays do not generate excess run off. During Winter, provision shall be made for a tanker, as required by the Engineer.

During high wind conditions, the Contractor shall comply with the Engineer's instructions regarding dust-damping measures. The Engineer may request the temporary cessation of all construction activities where wind speeds are unacceptably high, and until such time as wind speeds return to acceptable levels.

As required by the Project Specification, the Contractors shall develop and implement a programme for the monitoring of dust fallout in areas where dust generation may be expected.

4.11 Accommodation of site staff

With the exception of the night watchmen, none of the Contractor's staff shall be accommodated on Site overnight.

5. CONSTRUCTION

5.1 Method Statements

Any Method Statement required by the Engineer, Specification EM or the Project Specification shall be produced within such reasonable time as the Engineer shall specify or as required by Specification EM or the Project Specification. The Contractor shall not commence the activity until the Method Statement has been approved and shall, except in the case of emergency activities, allow a period of two weeks for approval of the Method Statement by the Engineer. Such approval shall not unreasonably be withheld.

The Engineer may require changes to a Method Statement if the proposal does not comply with the specification or if, in the reasonable opinion of the Engineer, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment in excess of that permitted by the Specifications.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The Contractor shall carry out the Works in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract.

Method Statements that shall be provided by the Contractor within 14 days of receipt of the letter of acceptance and prior to the activity covered by the Method Statement being undertaken, include:

1. Location and structure of the fuel storage site, including the type and volume of storage container and the design and capacity of the bund.
2. Solid waste (refuse) control and removal of waste from the Site, including the number, type and location of rubbish bins, the manner and frequency with which the waste will be removed from site and the disposal site.
3. Contaminated water management system, including an indication of the source and volume of contaminated water and how this would be disposed of.
4. Dust control, including methods to prevent dust generation and methods to reduce dust where its generation is unavoidable.
5. Location and layout of the construction camp in the form of a plan showing offices, stores for fuels and explosives, vehicle parking, access point, equipment cleaning areas and staff toilet placement.
6. Location of proposed site access routes and proposed traffic safety measures.
7. Emergency procedures for fire, and accidental leaks and spillages of hazardous materials.
8. Location, layout and preparation of cement/ concrete batching facilities including the methods employed for the mixing of concrete and the management of runoff water from such areas. An indication shall be given of how concrete spoil will be minimised and cleared.

9. Method of undertaking earthworks, including spoil management, erosion, dust and noise controls.
10. Motivation and method for undertaking any construction related activities within a “no-go” area, including requisite emergency procedures. Unless need clearly motivated and proposed methodology exhibits clear focus on environmentally sensitive construction practice, no activity will be permitted within the defined “no-go” areas.

5.2 Environmental awareness training

Within seven days of the Commencement Date, the Contractor's site staff including foremen and site management staff shall attend an environmental awareness training course, of approximately one-hour duration. The Contractor shall liaise with the Engineer prior to the Commencement Date to fix a date and venue for the course. The Contractor shall provide a suitable venue with facilities as required by the Project Specifications, and ensure that the specified employees attend the course.

No more than 20 people shall attend each course and the Contractor shall allow for sufficient sessions to train all personnel. Subsequent sessions shall be run for any new personnel coming onto site.

The environmental awareness training course shall be held in the morning during normal working hours. The information presented at the course shall be communicated to the Contractor's employees on the site, to any new employees coming onto site after the initial training course and to his suppliers. Provision should also be made for quarterly refreshers courses to be undertaken during the course of the Contract. The Contractor shall ensure that all attendees sign an attendance register, and shall provide the Engineer with a copy of the attendance register the day after each course.

5.3 Construction personnel information posters

The Contractor shall erect and maintain information posters for the information of his employees depicting actions to be taken to ensure compliance with aspects of the Specifications. Such posters shall be supplied by the Engineer and shall be erected at a location specified by the Engineer.

5.4 Site clearance

The Contractor shall ensure that the clearance of vegetation is restricted to that required to facilitate the execution of the works. Site clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible. The detail of vegetation clearing shall be subject to the Engineer's approval. All cleared vegetation shall either be mulched and mixed into the topsoil stockpiles or disposed of at an approved disposal site. The disposal of vegetation by burying or burning is prohibited without the requisite permit from the local authority.

The Contractor shall strip the topmaterial, which includes the top 150 mm of soil and root material of cleared vegetation, within the Working Areas, and this shall be stockpiled separately from subsoil for subsequent use during rehabilitation and revegetation. Topmaterial stockpiles shall not be compacted.

Should fauna be encountered during site clearance, earthworks shall cease until fauna have been safely relocated.

5.5 Site division

The Engineer shall be advised of the area that the Contractor intends using for the Construction Camp. The Construction camp shall occupy as small an area as possible, and no site establishment shall be allowed within 50 m of any watercourse unless otherwise approved by the Engineer.

The Contractor shall inform the Engineer of the intended actions and programme for site establishment. The site layout shall be planned to facilitate ready access for deliveries, facilitate future works and to curtail any disturbance or security implications for neighbours.

5.6 Site demarcation

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

5.7 "No go" areas

If so required by the Project Specification, certain areas shall be considered "no go" areas. The Contractor shall ensure that, insofar as he has the authority, no unauthorised entry, stockpiling, dumping or storage of equipment or materials shall be allowed within the demarcated "no go" areas.

"No go" areas shall be demarcated with fencing consisting of wooden or metal posts at 3 m centres with 1 plain wire strand tensioned horizontally at 900 mm from ground level. Commercially available danger tape shall be wrapped around the wire strand. The Contractor shall maintain the fence for the duration of the Contract and ensure that the danger tape does not become dislodged.

5.8 Protection of natural features

The Contractor shall not deface, paint, damage or mark any natural features (e.g. rock formations) situated in or around the Site for survey or other purposes unless agreed beforehand with the Engineer. Any features affected by the Contractor in contravention of this clause shall be restored/ rehabilitated to the satisfaction of the Engineer.

The Contractor shall take reasonable precautions to prevent any person from removing or damaging any fossils, coins, articles of value or antiquity and structures and other remains of archaeological interest discovered on the Site, immediately upon discovery thereof and before removal. The Contractor shall inform the Engineer immediately of such a discovery and carry out the Engineers instructions for dealing therewith. All works within the vicinity of the discovery must cease immediately and the area shall be cordoned off until such time as the Engineer authorises resumption of the works in writing.

The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, open water bodies) for the purposes of swimming, personal washing and the washing of machinery or clothes.

5.9 Protection of flora and fauna

Except to the extent necessary for the carrying out of the Works, flora shall not be removed, damaged or disturbed nor shall any vegetation be planted without authorisation.

Trapping, poisoning and/ or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on Site.

Where the use of herbicides, pesticides and other poisonous substances has been specified, they shall be stored, handled and applied with due regard to their potential harmful effects.

5.10 Protection of archaeological and palaeontological remains

The Contractor shall take reasonable precautions to prevent any person from removing or damaging any fossils, coins, articles of value or antiquity and structures and other remains of archaeological interest discovered on the Site, immediately upon discovery thereof and before removal. The Contractor shall inform the Engineer immediately of such a discovery and carry out the Engineers instructions for dealing therewith. All works within the vicinity of the discovery must cease immediately and the area shall be cordoned off until such time as the Engineer authorises resumption of the works in writing.

The Engineer will contact the relevant heritage authority.

5.11 Access routes/ haul roads

Access to the Construction camp and working areas shall utilise existing roads or tracks. Entry/ exit points onto public roads shall take cognisance of traffic safety. Traffic safety measures shall include appropriate signage and signalmen where relevant.

On the Site, and, if so required by the Project Specification, within such distance of the Site as may be stated, the Contractor shall control the movement of all vehicles and plant including that of his suppliers so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic and that all relevant laws are complied with. In addition such vehicles and plant shall be so routed and operated as to minimise disruption to regular users of the routes not on the Site. On gravel or earth roads on Site and within 500m of the Site, the vehicles of the Contractor and his suppliers shall not exceed a speed of 20 km/hr

Mud and sand deposited onto public roads by construction activities shall be cleared on a daily basis.

5.12 Cement and concrete batching

Where applicable, the location of the batching plant (including the location of cement stores, sand and aggregate stockpiles) will be approved by the Engineer. The concrete/cement batching plant shall be kept neat and clean at all times.

No batching activities shall occur directly on unprotected ground. The batching plant shall be located on a smooth impermeable surface (concrete or 250 µm plastic covered with 5 cm of sand). The area shall be bunded and sloped towards a sump to contain spillages of substances. All wastewater resulting from batching of concrete shall be disposed of via the contaminated water management system and shall not be discharged into the environment. Contaminated water storage areas shall not be allowed to overflow and appropriate protection from rain and flooding shall be implemented

Empty cement bags shall be stored in weatherproof containers to prevent wind blown cement dust and water contamination. Empty cement bags shall be disposed of on a regular basis via the solid waste management system, and shall not be used for any other purpose. Unused cement bags shall be stored so as not to be affected by rain or runoff events. In this regard, closed steel containers should be used for the storage of cement powder and any additives. The Contractor shall ensure that sand, aggregate, cement or additives used during the mixing process are contained and covered to prevent contamination of the surrounding environment.

The Contractor shall take all reasonable measures to prevent the spillage of cement/ concrete during batching and construction operations. During pouring, the soil surface shall be protected using plastic and all visible remains of concrete shall be physically removed on completion of the cement/ concrete pour and appropriately disposed of. All spoiled and excess aggregate/ cement/ concrete shall be removed and disposed of via the solid waste management system.

Where “readymix” concrete is used, the Contractor shall ensure that the delivery vehicles do not wash their chutes directly onto the ground. Any spillage resulting from the “readymix” delivery shall be immediately cleared and disposed of via the solid waste management system.

5.13 Earthworks

All earthworks shall be undertaken in such a manner so as to minimise the extent of any impacts caused by such activities, particularly with regards to erosion and dust generation. No equipment associated with earthworks shall be allowed outside of the Site and defined access routes unless expressly permitted by the Engineer.

5.14 Pumping

Pumps shall be placed over a drip tray in order to contain fuel spills and leaks. The Contractor shall take all reasonable precautions to prevent spillage during the refuelling of these pumps.

The Contractor shall ensure that none of the water pumped during any dewatering activities, including well points, is released into the environment without the Engineer's approval. The Engineer's approval will be required prior to the discharge of this water into the Municipal sewer system.

5.15 Bitumen

Over spray of bitumen products outside of the road surface and onto roadside vegetation or the surrounding environment shall be prevented using a method approved by the Engineer.

When heating bitumen products, the Contractor shall take cognisance of appropriate fire risk controls. Heating of bitumen products shall only be undertaken using LPG or similar zero emission fuels and appropriate fire fighting equipment shall be readily available.

Stone chip / gravel excess shall not be left on road / paved area verges. This shall be swept / raked into piles and removed to an area approved by the Engineer.

Water quality from runoff from new/ fresh bitumen surfaces will be monitored visually by the Engineer and remedial actions taken where necessary.

5.16 Fire control

No fires may be lit on site. Any fires that occur shall be reported to the Engineer immediately. Smoking shall not be permitted in those areas where it is a fire hazard. Such areas shall include the workshop and fuel storage areas and any areas where the vegetation or other material is such as to make liable the rapid spread of an initial flame. In terms of the Atmospheric Pollution Prevention Act (No. 45 of 1965), burning is not permitted as a disposal method.

The Contractor shall appoint a Fire Officer who shall be responsible for ensuring immediate and appropriate actions in the event of a fire and shall ensure that employees are aware of the procedure to be followed. The Contractor shall forward the name of the Fire Officer to the Engineer for his approval.

The Contractor shall ensure that there is basic fire-fighting equipment available on Site at all times. This shall include at least rubber beaters when working in urban open spaces and fynbos areas, and at least one fire extinguisher of the appropriate type when welding or other "hot" activities are undertaken.

5.17 Emergency procedures

The Contractor's procedures for the following emergencies shall include:

i) Fire

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

ii) Accidental leaks and spillages

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

In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200 l of hydrocarbon liquid spill.

5.18 Safety

Telephone numbers of emergency services, including the local fire fighting service, shall be posted conspicuously in the Contractor's office near the telephone.

No unauthorised firearms are permitted on Site.

5.19 Community relations

The Contractor shall erect and maintain information boards in the position, quantity, design and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the Engineer.

The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself.

5.20 Erosion and sedimentation control

The Contractor shall take all reasonable measures to limit erosion and sedimentation due to the construction activities. Where erosion and/or sedimentation, whether on or off the Site, occurs despite the Contractor complying with the foregoing, rectification shall be carried out in accordance with details specified by the Engineer. Where erosion and/or sedimentation occur due to the fault of the Contractor, rectification shall be carried out to the reasonable requirements of the Engineer.

Any runnels or erosion channels developed during the construction period or during the maintenance period shall be backfilled and compacted. Stabilisation of cleared areas to prevent and control erosion shall be actively managed. Consideration and provision shall be made for various methods, namely, brushcut packing, mulch or chip cover, straw stabilising (at a rate of one bale/ 20 m² and rotovated into the top 100 mm of the completed earthworks), watering, soil binders and anti erosion compounds, mechanical cover or packing structures (e.g. Hessian cover).

Traffic and movement over stabilised areas shall be restricted and controlled, and damage to stabilised area shall be repaired and maintained to the satisfaction of the Engineer.

5.21 Aesthetics

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

5.22 Recreation

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

5.23 Trenching

Trenching for services shall be undertaken in accordance with the engineering specifications with the following environmental amplifications, where applicable:

- a) Soil shall be excavated and used for refilling trenches i.e. soil from the first trench shall be excavated and stockpiled, thereafter soil from the second excavated trench length shall be used to backfill the trench behind it once the services have been laid. The last trench shall be filled using the soil stockpiled from the first trench.
- b) Trench lengths shall be kept as short as practically possible before backfilling and compacting.
- c) Trenches shall be re-filled to the same level as (or slightly higher to allow for settlement) the surrounding land surface to minimise erosion.

5.24 Demolition

Hazardous building materials, including asbestos shall be identified prior to demolition of any buildings and dealt with in accordance with the safety and health legislation. A Method Statement, outlining the proposed approach to the disposal of these materials, must be supplied for approval by the Engineer.

Hazardous and non-hazardous materials shall be separated at site and disposed of in a manner approved by the Engineer.

All buildings older than 60 years require a permit from South African Heritage Resources Agency in terms of the National Heritage Resources Act (no. 25 of 1999). A demolition permit is also required from the local authority in terms of the National Building Regulations.

5.25 Drilling and jack hammering

The Contractor shall take all reasonable measures to limit dust generation and noise as a result of drilling operations. The Contractor shall ensure that no pollution results from drilling operations, either as a result of oil and fuel drips, or from drilling fluid.

Any areas or structures damaged by the drilling and associated activities shall be rehabilitated by the Contractor to the satisfaction of the Engineer.

5.26 Stockpiling

The Engineer will identify suitable sites for stockpiling. Stockpiles shall be convex in shape, shall be no higher than 2 m and shall be located so as to cause minimal disturbance. Stockpiles shall be so placed to occupy minimum width compatible with the natural angle of repose of material, and measures shall be taken to prevent the material from being spread over too wide a surface. Where required, appropriate precautions shall be taken to prevent the erosion and limit the compaction of the stockpiles. The Contractor shall ensure that all stockpiles do not cause the damming of water or run off, or is itself washed away.

Topmaterial stockpiles shall not be covered with any material (e.g. plastic) that may kill seeds or cause it to compost. If the stockpiles start to erode significantly or cause dust problems, they shall be covered with hessian. Where practical, topmaterial shall not be left for longer than six to eight months before being used for rehabilitation. If stored for longer than six months, the topsoil shall be analysed and, if necessary, upgraded before placement.

5.27 Site closure and rehabilitation

Any areas that the Engineer believes may have been impacted upon or disturbed, shall be rehabilitated to the satisfaction of the Engineer, which includes all areas where topsoil has been stripped. Once construction is complete the contractor shall clear everything from the Site not forming part of the Permanent Works. The area to be rehabilitated shall first be landscaped to match the topography of the surrounding area as it was prior to construction. The composition of vegetation to be used for any rehabilitation shall be as per the Project Specifications.

The contractor may not use herbicides, pesticides, fertilisers or other poisonous substances for the rehabilitation process unless otherwise agreed with the Engineer.

All rehabilitated areas shall be considered “no go” areas and the Contractor shall ensure that none of his staff or equipment enters these areas.

The Contractor shall undertake to remove all alien vegetation re-establishing on the area and shall implement the necessary temporary or permanent measures to combat soil erosion.

5.28 Temporary revegetation of the areas disturbed by construction.

Where there is likely to be a delay of greater than two weeks in the landscaping and revegetation of a disturbed area or where that site is likely to be the subject of further construction activities at a later stage, the Contractor shall ensure that the area is temporarily revegetated to combat dust generation and prevent erosion. This revegetation shall occur incrementally immediately upon completion of the construction activities at the subject location.

Prior to revegetation structures and material not forming part of the Permanent Works, including remnants of building materials, concrete foundations, timber and other foreign debris, shall be removed and disposed of via the solid waste management system. The area shall be revegetated as follows:

- a) The surface shall be levelled by hand or machine as far as practically possible.
- b) Alien vegetation shall be cleared by cutting the plants off at ground level, and painting the stump with 0.5% Garlon in diesel.
- c) For areas with a slope of greater than 1:3, straw shall be utilised as a binding material to stabilise the soil during revegetation and rehabilitation of the site. Straw shall consist of natural, dried fibres of hay or chaff of various lengths between 50 mm and 400 mm, delivered to Site in bales and shall be applied evenly by hand or machine at a rate of 1 bale per 20 m² over the area to be revegetated. It shall then immediately be rotovated into the upper 100 mm layer of soil.

- d) The prepared area shall be hydro- or hand-seeded at a rate of 40 kg/ ha using Rye grass (*Lolium multiflorum*). In the event of hand-seeding, the seed mixture as specified shall be mixed with two parts per volume of clean dry plaster sand, then divided in half and applied evenly in two successive applications, one after the other, by means of an approved hand seeding machine (known colloquially as a “tefsaaier”). On completion of the seeding the surface shall be lightly raked to cover the seed with no more than 5 mm of soil.
- e) Water used for the irrigation of vegetated areas shall be free of pollutants that will have a detrimental effect on the plants. The vegetated area shall only be watered once, immediately following seeding. Watering should be carried out from a tanker, using a fine nozzle spray to avoid erosion and disturbance of the vegetation. Water for irrigation purposes may not be drawn from any water body.

No construction equipment, vehicles or unauthorised personnel shall be allowed onto areas that have been vegetated. Only persons or equipment required for the preparation of areas, application of fertiliser and maintenance of revegetated area shall be allowed to operate on these areas.

5.29 Traffic safety

The Contractor shall ensure traffic safety at all times and shall implement safety measures to this end. General and personal traffic safety is the responsibility of the individual.

5.30 Temporary site closure

6. TOLERANCES

Environmental management is concerned not only with the final results of the Contractor's operations to carry out the Works but also with the control of how those operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operations required to complete the Works.

It is thus required that the Contractor shall comply with the environmental requirements on an ongoing basis and any failure on his part to do so will entitle the Engineer to certify the imposition of a penalty as detailed below.

6.1 Penalties

Penalties will be issued for the transgressions listed below. Penalties may be issued per incident at the discretion of the Engineer. Such penalties will be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications. The Engineer will inform the Contractor of the contravention and the amount of the penalty, and will deduct the amount from monies due under the Contract.

Penalties will be as per the Project Specification.

6.2 Removal from site and suspension of Works

The Engineer may instruct the Contractor to remove from Site any person(s) who in their opinion is guilty of misconduct, or is incompetent, negligent or constitutes an undesirable presence on Site. Subclause 4.9 of this Specification requires that all Plant be in good working order, and accordingly the Engineer may order that any Plant not complying with the Specifications be removed from Site. Where the Engineer deems the Contractor to be in breach of any of the requirements of this Specification, he may order the Contractor to suspend the progress of the Works or any part thereof.

7. TESTING

Void

8. MEASUREMENT AND PAYMENT

8.1 Basic principles

Except as noted below and in PSEM 8.2.1 as Scheduled Items, no separate measurement and payment will be made to cover the costs of complying with the provisions of this specification and such costs shall be deemed to be covered by the rates tendered for the items in the Schedule of Quantities completed by the Contractor when submitting his tender.

8.2 Scheduled items

8.2.1 All requirements of the environmental management specification

All work not measured elsewhere, associated with complying with any requirement of the environmental management specification shall be measured as a sum. The tendered rate shall cover any cost associated with complying with the environmental management specification and shall include for all materials, labour and plant required to execute and complete the work as specified, described in the Schedule of Quantities or shown on the drawing(s).

8.2.2 Method Statements: Additional Work

No separate measurement and payment will be made for the provision of Method Statements but, where the Engineer requires a change on the basis of his opinion that the proposal may result in, or carries a greater than warranted risk of damage to the environment in excess of that warranted by the Specifications, then any additional work required, provided it could not reasonably have been foreseen by an experienced contractor, shall be valued in accordance with GCC 90 Clause 40.

8.2.3 Work "required by the Project Specification"

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

PART B : Occupational Health & Safety Specification

PHS PARTICULAR SPECIFICATION: OCCUPATIONAL HEALTH & SAFETY

CONTENTS

PHS 01	DOCUMENT PURPOSE AND INTENT
PHS 02	SPECIFICATION CONTROL SHEET
PHS 03	APPLICATION AND INTERPRETATION
PHS 04	NOTIFICATION OF CONSTRUCTION WORK
PHS 05	LEGAL DOCUMENTATION/APPOINTMENTS
PHS 06	GENERAL DUTIES OF PRINCIPAL CONTRACTOR
PHS 07	SUPERVISION OF CONSTRUCTION WORK
PHS 08	RISK ASSESSMENT
PHS 08(B)	SAFE WORKING PROCEDURES
PHS 09	FALL PROTECTION
PHS 10	COMMUNICATION
PHS 11	REGISTERS
PHS 12	TRAINING
PHS 13	AGENT HEALTH AND SAFETY INSTRUCTION REGISTER
PHS 14	GENERAL REQUIREMENTS
PHS 15	HAZARDOUS CHEMICAL SUBSTANCES (INCLUDING ASBESTOS AND LEAD)
PHS 16	ASBESTOS (ADDITIONAL REQUIREMENTS)
PHS 17	LEAD (ADDITIONAL REQUIREMENTS)
PHS 18	NOISE INDUCED HEARING LOSS
PHS 19	THERMAL (HEAT)
PHS 20	LIGHTING
PHS 21	HAZARDOUS BIOLOGICAL AGENTS (HBA)

PHS 01 DOCUMENT PURPOSE AND INTENT

The specifications contained in this document relate to the health and safety requirements pertaining to the associated works of the aforementioned construction site, so as to ensure the health and safety of persons on all aspects of the construction work involved in Contract T 2023/022.

Compliance to the Occupational Health and Safety Act (Act 85 of 1993) and the Regulations shall not be limited to the specifications and definitions contained in this document.

A comprehensive, documented Health & Safety Plan (H&S Plan) is to be drawn up based on the specifications provided and presented to the agent for approval prior to commencement of work / after award.

Monitoring of compliance on site shall be to the requirements of the OHS Act and Regulations as well as the contents of the H&S Plan(s) of the Principal Contractor and Contractors.

PHS 02 SPECIFICATION CONTROL SHEET

Project Name: CONSTRUCTION OF A CLASS B LANDFILL SITE AT WORCESTER, CWDM

Contract No: T 2023/022

Physical Location: WORCESTER

PHS 03 APPLICATION AND INTERPRETATION

This document is to be read and understood in conjunction with the following, inter alia:

- Occupational Health and Safety Act (Act 85 of 1993).
- All regulations published in terms of the Occupational Health and Safety Act.
- Construction Regulations, 2014.
- SABS codes referred to by the Occupational Health and Safety Act.
- Contract Documents
- Basic Conditions of Employment Act (Act 75 of 1997)

3.1 Definitions

The following definitions from the Occupational Health and Safety Act are listed as follows:

Chief Executive Officer

In relation to a body corporate or an enterprise conducted by the State, means the person who is responsible for the overall management and control of the business of such body corporate or enterprise.

Danger

Means anything which may cause injury or damage to persons or property.

Employee

Means, subject to the provisions of Subsection (2), any person who is employed by or works for any employer and who receives or is entitled to receive any remuneration or who works under the direction or supervision of an employer or any other person.

Employer

Means, subject to the provisions of Subsection (2), any person who employs or provides work for any person or remunerates that person or expressly or tacitly undertakes to remunerate him, but excludes a labour broker as defined in Section 1(1) of the Labour Relations Act, 1953 (Act No. 28 of 1956).

Healthy

Means free from illness or injury attributable to occupational causes.

Machinery

Means any article or combination of articles assembled, arranged or connected and which is used or intended to be used for converting any form of energy to performing work, or which is used or intended to be used, whether incidental thereto or not, for developing, receiving, storing, containing, confining, transforming, transmitting, transferring or controlling any form of energy.

Medical Surveillance

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

Plant

Includes fixtures, fittings, implements, equipment, tools and appliances, and anything which is used for any purpose in connection with such plant.

Properly Used

Means used with reasonable care, and with due regard to any information, instruction or advice supplied by the designer, manufacturer, importer, seller or supplier.

User

In relation to plant or machinery, means the person who uses plant or machinery for his own benefit or who has the right of control over the use of plant or machinery, but does not include a lessor of, or any person employed in connection with, the plant or machinery.

Reasonably Practicable

Means practicable having regard to:

- (a) the severity and scope of the hazard or risk concerned,
- (b) the state of knowledge reasonably available concerning that hazard or risk and of any means of removing or mitigating that hazard or risk.
- (c) the availability and suitability of means to remove or mitigate that hazard or risk; and
- (d) the cost of removing or mitigating that hazard or risk in relation to the benefits deriving there from.

Risk

Means the probability that injury or damage will occur.

Safe

Means free from any hazard.

Standard

Means any provision occurring:

- (a) in a specification, compulsory specification, code of practice or standard method as defined in Section 1 of the Standards Act, 993 (Act No. 29 of 1993); OR
- (b) in any specification, code or any other directive having standardization as its aim and issued by an institution or organization inside or outside the Republic which, whether generally or with respect to any particular article or matter and whether internationally or in any particular country or territory, seeks to promote standardization.

The following definitions from the Construction Regulations are listed as follows:

Agent

Means any person who acts as a representative for a client.

Competent Person

Means any person having the knowledge, training, experience and qualifications specific to the work or task being performed:

Provided that where appropriate qualifications and training are registered in terms of the provisions of the South African Qualifications Authority Act, 1995 (Act No. 58 of 1995), these qualifications and training shall be deemed to be the required qualifications and training.

Construction

Means any work in connection with:

- (a) the erection, maintenance, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure;
- (b) the installation, erection, dismantling, or maintenance of a fixed plant where such work includes the risk of a person falling;
- (c) the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; OR
- (d) the moving of earth, clearing of land, the making of an excavation, piling or any similar type of work.

Contractor

Means an employer, as defined in Section 1 of the Act, who performs construction work and includes Principal Contractors.

Hazard Identification

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

H&S Plan

Means a documented plan which addresses hazards identified and includes safe work procedures to mitigate, reduce or control the hazards identified.

Health and Safety Specification

Means a documented specification of all health and safety requirements pertaining to the associated works on a construction site, so as to ensure the health and safety of persons.

Method Statement

Means a document detailing the key activities to be performed in order to reduce as reasonably as practicable the hazards identified in any risk assessment.

Principal Contractor

Means an employer, as defined in Section 1 of the Act who performs construction work and is appointed by the client to be in overall control and management of a part of or the whole of a construction site.

Risk Assessment

Means a program to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard.

PHS 04 NOTIFICATION OF CONSTRUCTION WORK

The Principal Contractor shall notify by registered mail, the local relevant Provincial Director of the Department of Labour, before commencing with construction work, of the intended work in the form of Annexure A of the Construction Regulations.

A copy of the completed Annexure A shall be included in the plan as well as proof that the Provincial Director has been notified.

A copy of the completed Annexure A is to be kept on site by the Principal Contractor.

PHS 05 LEGAL DOCUMENTATION/APPOINTMENTS

The following documents shall form part of the H&S Plan, to be provided when submitting a tender, or if no tender process was followed, prior to commencement of work:

- Health and Safety Policy signed by CEO.
- Letter of good standing with the Compensation Commissioner, Federated Employers or similar insurer.
- Health and Safety Organogram, outlining the Health and Safety Team, delegations and responsibilities of each member, as well as the appointment(s) that each member carries.

The following legal appointments shall form part of the H&S Plan and must be in place prior to commencement of work:

APPOINTMENT	OHS-ACT/ REGULATION REFERENCE
Section 16.2 appointment	Section 16.2
Health and Safety Representative(s)	Section 17
Health and Safety Committee Members	Section 19
Incident Investigator(s)	GAR 8(2)
First Aider(s)	GSR 3
Fire Fighter(s)	ER 9
Risk Assessor(s)	HC (Incl. Asbestos & lead); CR

- Health and Safety Committee Meeting(s), where applicable, are to be held monthly.
- Minutes of the Health and Safety Committee are to be provided to the agent within 3 days of the meeting being held.

The competencies of the incident investigator(s), first aider(s), fire fighter(s) and risk assessor(s) must be proved in the plan (see definition of a competent person).

The following Competent Persons shall be appointed in writing (where applicable) prior to any work being carried out, and such work shall adhere to the requirements of the specific sub-regulations. The appointment letter, qualifications and C.V. of each competent person is also to be provided in the H&S Plan.

APPOINTMENT	REGULATION
Construction Supervisor	CR 6(1)
Assistant Construction Supervisor	CR 6(2)
Fall Protection Competent Person	CR 8(1)
Formwork and support work	CR 10(1)
Excavation Work Competent Person	CR 11(1)
Demolition Work Competent Person	CR 12(1)
Scaffolding Competent Person	CR 14(2)
Suspended Platform Competent Person	CR 15(1)
Material Hoist Competent Person	CR 17(8)
Batch Plant Competent Person	CR 18(1)
Explosive Powered Tools Competent Person	CR 19(2)
Construction Vehicle and Mobile Plant Competent Person	CR 21(1)(j)
Electrical installations and machinery	CR 22(e)
Stacking Competent Person	CR 26(a)
Fire equipment Competent Person	CR 27(h)

APPOINTMENT	REGULATION
Confined Spaces Competent Person	GSR (5)
Lifting Machines Operator	DMR 18(11)
Tower Crane Operator	CR 20

Indicate in the H&S Plan which of these listed topics and subsequent appointments are applicable to the construction work in question.

No work involving any of the applicable topics may be performed without the knowledge and approval of an appointed competent person.

The competent person shall be responsible to determine the level of supervision required for each activity.

All these supervisory requirements shall be indicated in detail in the H&S Plan.

PHS 06 GENERAL DUTIES OF PRINCIPAL CONTRACTOR

The principal contractor will be responsible for co-operation between all contractors to ensure compliance to the OHS –Act and Regulations on site.

To ensure the above, the Principal Contractor must carry out the following:

- Provide Health and Safety Specifications to Contractors.
- Appoint Contractors in writing.
- Ensure that Contractors H&S Plan has been approved, implemented and maintained.
- Ensure that Contractors are registered with the Compensation Commissioner or similar insurer.
- Ensure that Contractors made provision for the cost of Health and Safety measures during the construction process.

The Principal Contractor will be required to assess and approve the contractor's Health and Safety Plan within 5 days of receipt thereof.

PHS 07 SUPERVISION OF CONSTRUCTION WORK

The agent must be informed if the construction work supervisor is also appointed as a construction supervisor for another site.

PHS 08 RISK ASSESSMENT

Risk assessments of all required activities shall form an integral part of the H&S Plan.

All risk assessments shall be conducted in terms of an acceptable methodology, prior to commencement of work, according to the provisions of CR 7 and should cover at least the following:

- Formwork erection and demolition
- Reinforcement erection
- Casting of concrete
- Operation of cranes
- Using power tools
- Movement of construction vehicles
- Shift work
- All work near overhead power lines and underground cables
- Locating underground cables prior to excavation
- Excavation for structures and pipelines
- Temporary stockpiling and removal of excavated material
- Transporting material
- Installation of pipelines and backfilling
- Roadway surfacing
- Lay of electrical cables
- Security during working hours
- Work next to standing and flowing water
- Work next to existing mechanical and electrical equipment
- Work next to temporary flow diversions and temporary sluice gates

- Working at heights
- Working near existing aerated bioreactors, gas releasing digesters and settling tanks
- Working next to and in septic unhealthy raw sewage
- All health hazards that can be present during any of the above activities and should include individual dusts, gases, fumes, vapours, noise, extreme temperatures, illumination, vibration and ergonomic hazards

The above list is by no means exhaustive and should not be limited to these activities but must cover all activities that forms part of the said construction work. Each activity must be split down to individual task and all associated hazards identified and listed in the risk assessment. This ensures that critical tasks and subsequent critical hazards are not missed.

Reference should be made to:

- Methodology used to do risk assessments
- Expected activities and processes to be covered
- High risks anticipated

Risk assessment to cover all safety and health hazards.

All risk assessments are to be conducted by a competent person(s) as appointed under paragraph 5 of this document. The plan must include a declaration in this regard or the risk assessment must contain the signature(s) of these appointed persons.

The agent reserves the right to stop any work if such work is not conducted in terms of the recommendations of the risk assessment.

PHS 08 (B) SAFE WORK PROCEDURES

Safe Work Procedures for the following activities are to form part of the H&S Plan:

- Formwork erection and demolition
- Reinforcement erection
- Casting of concrete
- Operation of cranes
- Using power tools
- Movement of construction vehicles
- All work near overhead power lines and underground cables
- Locating underground cables prior to excavation
- Excavation for structures and pipelines
- Temporary stockpiling and removal of excavated material
- Transporting material
- Bulk earthworks
- Installation of pipelines and backfilling
- Roadway surfacing
- Lay of electrical cables
- Security during working hours
- Work next to standing and flowing water
- Work next to existing mechanical and electrical equipment
- Work next to temporary flow diversions and temporary sluice gate
- Erection/dismantling of scaffolding
- Working at heights
- Working near existing aerated bioreactors, gas releasing digesters and settling tanks
- Working next to and in septic unhealthy raw sewage
- All health hazards that can be present during any of the above activities and should include individual dusts, gases, fumes, vapours, noise, extreme temperatures, illumination, vibration and ergonomic hazards

The following table provides information on all factors to be taken into account when the risk assessments and Safe Work Procedures are compiled:

Physical	Chemical	Biological	Mechanical	Psycho-social
Noise	Liquids	Insects	Posture	Stress
Vibration	Dusts	Fungi	Movement	Work pressure
Ionising radiation	Fumes	Bacteria	Repetitive tasks	Monotony

Non-ionising radiation	Fibres	Viruses		Unsociable hours
Health and cold	Mists			Ergonomical
Electricity	Gases			
Pressure	Vapours			
System	Stress/Agency		Illness/Disease	
Musculoskeletal	Lifting/loads Repetitive strain Abnormal postures Whole body vibration		Muscular pain syndromes Tenosynovitis Bursitis Osteoarthritis	
Sensory	Noise		Hearing loss	
Skin	Cement (chromates), rubber Thinners, epoxies Tar, pitch Solar radiation		Allergic contact dermatitis Irritant contact dermatitis Acne, Skin cancer Keratosis, Cancer	
Respiratory	Silica Asbestos Spraypaints, woods, epoxies Irritant dusts, welding fumes		Silicosis, TB, Asbestosis, Cancer Asthma Bronchitis	
Psychosomatic	Physical stress Psychosocial stress		Headaches Depression Fatigue Substance abuse	
Nervous System	Lead Organic solvents		Peripheral and central neuropathy Headaches, Dizziness, Mood disorder, Dementia	

PHS 09 FALL PROTECTION

In addition to the requirements of this sub-regulation the following shall apply:

The fall protection plan is to be prepared by the fall protection competent person. The fall protection plan must be signed by this competent person.
Content of the fall protection plan must cover all the requirements as stated in sub-regulation CR 8.

The fall protection plan is to be handed to the agent before work commences.
The level of supervision is to be stated in the fall protection plan.

PHS 10 COMMUNICATION

In addition to the requirements of this regulation the following shall apply:

The Principal Contractor is to indicate in his H&S Plan the level of liaison between himself and the designer of the building or structure.

The Principal Contractor shall insist that all instructions from the designer are conveyed to him in writing.

PHS 11 REGISTERS

The maintenance of the following registers at the frequency indicated must be specifically indicated in the H&S Plan.

All registers must be available at the site offices at all times for inspection by the agent.

The list of registers to be kept is by no means exhaustive and the H&S Plan should list all the registers that are applicable and at what frequency they are going to be maintained.

ACTIVITY	FREQUENCY
Form work/Support work	Daily, prior to any shift, after rain or blasting.
Excavation Work	Daily, prior to any shift, after rain or blasting or after unexpected fall of ground
Scaffolding	Daily, prior to any shift, after rain or blasting.
Suspended Platforms: 15(8)(a); 15(9); 15(8)(b); 15(10)	Daily
Boatswain's Chair	Daily
Lifting machines	Daily
Material Hoist	Daily
Batch Plants	Daily
Explosive Powered Tools	Daily Before Use
Cranes Logbook	As per DMR 18
Construction Vehicles and Mobile Plant	Daily
Temporary Electrical Installation	Weekly
Stacking	Weekly
Fire Extinguishers	Bi-Monthly
Ablution Facilities	Weekly
Ladders	Weekly
Fall protection equipment	Daily
Incident Register in terms of GAR 8	As Required

PHS 12 TRAINING

Each H&S Plan shall indicate the following regarding training:

- Type and contents of each training course to be conducted.
- Method and frequency by which all employees are informed regarding hazards identified during risk assessments.
- Type and content of each health and safety induction training course to be presented.
- Method of informing visitors and other persons entering the site of hazards prevalent on site.
- Method of providing personal protective equipment to visitors and non-employees.
- An example of ID training card for each employee.
- Methodology to be used in the issuing of written instructions.

PHS 13 AGENT HEALTH AND SAFETY INSTRUCTION REGISTER

The agent will keep on site an Agent Health and Safety Instruction Register.

The Principal Contractor shall be required to sign the register at the end of each day to acknowledge any instructions issued.

PHS 14 GENERAL REQUIREMENTS

14.1 Personal Protective Equipment

The procedures of issuing and control over PPE shall be indicated in the H&S Plan, as well as the enforcement for the wearing thereof.

14.2 Hired Plant

The responsibility for the safe condition and use of all hired plant shall be that of the contractor.

14.3 Transport of Employees

Transport of employees shall be carried out in terms of the National Road ordinances. The H&S Plan shall detail the arrangements and methods of the transportation of workers.

14.4 Signs

The Principal Contractor shall indicate in his H&S Plan the arrangements regarding the posting of danger signs, both for the public and employees as is necessary.

14.5 Certificates of fitness

The Principal Contractor shall include in his H&S Plan copies of all people that require medical fitness certificates under the following regulations:

- CR 20
- CR 8
- CR 21
- EW 2

PHS 15 HAZARDOUS CHEMICAL SUBSTANCES (including Asbestos and Lead)

In addition to the requirements in the HCS Regulations, the Principal Contractor must provide proof in the H&S Plan that:

- All possible activities associated with this construction work has been considered to identify all possible hazardous chemical substances.

- MSDS's of the relevant materials/hazardous chemical substances are in possession prior to use by the contractor. Mention should be made how the Principal Contractor is going to act according to special/unique requirements made in the relevant MSDS's. All MSDS's shall be available for inspection by the agent at all times. To comply with this requirement, MSDS's can be included in the H&S Plan.
- Risk assessments are done at least once every two years.
- Exposure monitoring is done according to OESSM and by an AIA and that the medical surveillance programme is based on the outcomes of the exposure monitoring.
- How records are going to be kept safe for the stipulated period of 30 years.
- How the relevant HCS's are being/going to be controlled by referring to:
 - Limiting the amount of HCS
 - Limiting the number of employees
 - Limiting the period of exposure
 - Substituting the HCS
 - Using engineering controls
 - Using appropriate written work procedures
- The correct PPE is being used.
- HCS are stored and transported according the SABS 072 and 0228.
- Training with regards to these regulations were given to employees.
- The H&S plan should make reference to the disposal of hazardous waste on classified sites and the location thereof.

PHS 16 ASBESTOS

The following asbestos related information must be included in the Health and Safety Plan:

- Proof of notification of conducting of asbestos work, to the Provincial Director, in writing, prior to the commencement of asbestos work.
- Contents of training to be provided to employees regarding asbestos work.
- Risk assessments relevant to all asbestos work. (Including laying of new pipes and cutting into existing pipes).
- Competency of person conducting risk assessment.
- Extent of monitoring of asbestos exposure.
- Detailed safe work procedure **regarding cutting / drilling of products / pipes containing asbestos** (Refer Asbestos Regulation 11, 13, 15).
- **Detailed safe work procedures** regarding control of exposure to raw sewerage when cutting into existing sewers/pipes.
- Specific reference to type, use and maintenance of personal protective equipment.
- Detailed information regarding collection and disposal of asbestos waste, wastewater and sludge generated from cutting operation.
- Proof of a structured medical surveillance programme, if required by an occupational medicine practitioner.
- Copies of results of all assessments, exposure monitoring and the written inventory of the location of the asbestos at the workplace.
- How records are going to be kept safe for the stipulated period of 40 years.

PHS 17 LEAD

Besides the requirements listed under par. 15 should lead be identified as a hazard at the workplace, the following must be included in the H&S Plan or as soon as its available:

- Proof that an initial health evaluation was carried out by an occupational health practitioner within 14 days after commencement of work.
- Copies of the results of all assessments, exposure monitoring and the written inventory of the location of the asbestos at the workplace.
- Only proof that medical surveillance has been conducted and not the actual records itself since these are of a confidential nature.
- How records are going to be kept safe for the stipulated period of 40 years.

PHS 18 NOISE INDUCED HEARING LOSS

Where noise is identified as a hazard the requirements of the NIHL regulations must be complied with and the following must be included/ referred to in the H&S Plan:

- Proof of training with regards to these regulations.
- Risk assessment done within 1 month of commencement of work.
- That monitoring carried out by an AIA and done according to SABS 083.
- Medical surveillance programme established and maintained for the necessary employees.
- Control of noise by referring to:
 - Engineering methods considered
 - Admin control (number of employees exposed) considered
 - Personal protective equipment considered/decided on
- Describe how records are going to be kept for 40 years.

PHS 19 THERMAL (HEAT)

Where heat is identified as a hazard the requirements of the thermal regulations must be complied with and the following must be included or referred to:

- Risk assessment done to determine if environment has a WBGT index = >30.
- Proof that employees are certified fit to work in heat environment.
- Proof that employees are acclimatized.
- How provide drinking water of 600 ml per hour is going to be provided.
- The availability of first aid on the premises.
- Training of employees with regards to heat illness and the management thereof.

PHS 20 LIGHTING

Where poor or lack of illumination is identified as a hazard the lighting regulations must be complied with and the following must be included in the H&S Plan:

- How lighting will be ensured/provided where daylight is not sufficient and /or after hours are worked.
- Planned maintenance programme for replacing luminaires.
- Proof of illumination levels of artificial illumination equipment.

PHS 21 HAZARDOUS BIOLOGICAL AGENTS (HBA)

Because of the possible exposure of workers to raw sewage the H&S Plan shall include details of the following:

The conducting of Risk Assessments specifically aimed at exposure to HBA which shall include the following:

- Nature and dose of HBA
- Where HBA may be present and in what physical form
- The nature of work, process
- Steps in the event of failure of control measures
- The effects of the HBA
- The period of exposure
- Control measures

Monitoring of exposure of workers shall be conducted to establish whether any worker is infected with an HBA associated with working or being exposed to raw sewage, in terms of the following:

- By an occupational medicine practitioner
- Before entering the site to establish the workers baseline
- During the period of the contract should the risk assessment indicate possible exposure
- After completion of the contract

Medical surveillance should such be required after the above-mentioned monitoring by an occupational health practitioner

Indicate how all records of assessment, monitoring, etc will be kept, taking into account that records have to be kept for a period of 40 years.

How exposure to HBA is to be controlled

The provision of personal protective equipment

What information and training is to be provided to employees regarding the following:

- The contents of these regulations
- Potential risks to health
- Control measures to be implemented
- The correct use and maintenance of personal protective equipment
- The results of the risk assessment

PART C : Works Particular Specifications

PS 01 DOCUMENT PURPOSE AND INTENT

The specifications contained in this section of the tender documentation provide Particular Specifications pertaining to the associated works of the aforementioned construction site, where specifications may not be fully covered in the Bill of Quantities, Drawings or by Standard Specifications, for the purpose of clarifying the scope and pricing the Tender.

PS 02 ANCHOR TRENCH RESTRICTED EXCAVATION

The anchor trenches shall be excavated by the contractor to line and widths shown on the design drawings, prior to the geosynthetics layers placement. Anchor trenches excavated in clay soils susceptible to desiccation cracking should be excavated only for the length required for that day's geomembrane liner placement. Corners in the anchor trenches shall be slightly rounded where the geomembrane liner adjoins the trench to minimise sharp bends in the geomembrane liner.

PS 02.1 The Edge Berm anchor trench (600mm x 500mm) is for anchoring GCL, HDPE geomembrane and geotextile. Backfill is to be selected material, stabilised with 10% by density with OPC. Cement is to be included in rate.....m³

PS 02.2 Cell Separation Berm anchor trench (600mm x 500mm) is for anchoring GCL, HDPE geomembrane and geotextile. Backfill is to be selected material, stabilised with 10% by density OPC. Cement is to be included in rate.....m³

PS 02.3 The Dams Edge Berm anchor trenches (700mm x 500mm) are for anchoring GCL, HDPE geomembranes, cuspated drain, geotextile and geocells. Backfill is to be selected material, stabilised with 10% by density with OPC. Cement is to be included in rate.....m³

PS 02.4 Testing fill

Tests are to be carried out on fill material in items PS 02.1 to PS 02.3 as per table below:

Table 02.5: Engineered fill and anchor trench backfill construction testing

Test Designation	ASTM Designation	Frequency
Visual-Method Soil Classification	D2488	Continual during excavation and placement of soils
Moisture-Density	D1557	1 per 5,000 m ³ or each material type
Sieve Analysis	D422	1 per 1,500 m ³ or each material type
Atterberg Limits	D4318	1 per 1,500 m ³ or each material type
Nuclear Moisture/Density ¹	D6938	1 Per 500 m ³ , one per lift, or one per day – whichever results in a higher number of tests
Moisture Content	D2216	1 per 20 Nuclear moisture tests
Sand Cone Test, or Drive Cylinder Test	D1556 or D2937	A minimum of 1 Per 20 Nuclear Density Tests

PS 03 STONE LAYER FROM COMMERCIAL SOURCE

Import and place 38mm washed stone aggregate for leachate collection layer, in base sumps and subsoil sumps. The stone shall not be flaky. Flakiness Index measured in accordance with SABS 1083 shall not exceed 20%.

PS 03.1 Conformance Testing

Both pre-construction and construction testing are required for these materials. Pre-construction testing consists of testing proposed materials from samples obtained at the aggregate or on-site borrow source.

Construction testing consists of testing performed from samples obtained during delivery of materials during the module or layer construction.

The tests to be performed, including testing frequency, for each material type are presented in Table PS03.1. The testing frequencies specified in the table may be increased when construction conditions warrant additional tests. Additional testing may be performed on suspect materials as recommended by the Design Engineer.

Table PS03.1 : Drainage gravel layer construction testing

Test Designation	Specification	Designation Frequency
Sieve Analysis	D422	1 per 1,500 m ³ or each material type
Aggregate Crushing Value	SANS 3001-AG10	1 per 1,500 m ³ or each material type
Flakiness Index	SANS 5847	1 per 1,500 m ³ or each material type

PS 03.2 Plant

Notice the following with respect to Plant in laying the drainage gravel layer:

- Care is to be taken when placing the drainage layer on the HDPE geomembrane, so that the geomembrane is not punctured or damaged during placement operations. Appropriate light ground pressure equipment is to be used and that equipment must avoid sharp turns.
- If the equipment or material placement procedures do not comply with the Project Specifications, the geomembrane shall be exposed and inspected for potential damage.
- Unless otherwise agreed, the maximum permitted machinery weight for the drainage layer placement shall be 10 tonne and at no point shall tracked placement equipment operate on a working platform of less than 150 mm thickness of material above the protection geotextile.

PS 03.3 Construction

- Where applicable, carefully place the leachate drainage layer on the liner ensuring any potential for geomembrane damage is minimised.
- The crushed rock aggregate must be inspected and approved by the Design Engineer and CQA Engineer prior to being placed on the liner system.
- Under no circumstances may a machine or truck track be directly on the protection geotextile, separation geotextile or the geomembrane liner once laid to its specification.
- Where the slope, upon which the leachate drainage layer is to be constructed, is steeper than 1V:5H, construction is to proceed from the lower level, in an upwards direction only.

- e) The aggregate shall be placed by trucking the material over previously placed aggregate and unloading on the previously placed material.
- f) The aggregate shall be no less than 0.75 m thick where wheeled vehicles are to traverse the aggregate. The method of working shall comprise end-tipping and spreading from previously placed material, or a method agreed with the Engineer prior to work commencement.
- g) Spreading of the aggregate to the required 150mm thick layer shall be carried out with low bearing pressure equipment.
- h) The drainage aggregate shall also be placed around the leachate collection pipes as shown on the Drawings. The Contractor shall take care to ensure that the aggregate is worked around the leachate collection pipes to provide uniform support around the pipes.
- i) Spreading of the stone to be carried out in a manner that prevents stretching, tearing, distortion or other damage to the protection geotextile, separation geotextile and the geomembrane.
- j) Locking of tracks of dozers is prohibited. Stopping shall be carried out slowly. To prevent any possible rotational strain on the underlying geosynthetics, no turns over a tight radius will be permitted. Where sudden stoppage of a vehicle or tight turns are witnessed, the underlying geosynthetics shall be exposed to assess if damage has occurred.
- k) The Contractor may elect to prepare a trial pad to allow the Engineer to assess the proposed equipment and/or plant.

PS 04 GEOSYNTHETIC CLAY LINER

Geosynthetic Clay Liner (GCL): A factory manufactured hydraulic barrier consisting of Sodium Bentonite clay sandwiched between, supported and encapsulated by two geotextiles, held together by needle punching. Contractor to supply and install 3.7kg/m² Geosynthetic Clay Liner manufactured in accordance with GRI-GCL3 specifications.

PS 04.1 Conformance Testing

Acceptable GCL's for this Contract include any needle punched GCL's that meet all the requirements of this specification as detailed within the design drawings and specification document. Before considering an alternative GCL material to the specifications as detailed in the Contract Documents, the Contractor shall submit with his Tender certified test results and statements of quality from the proposed GCL supplier to the Engineer, indicating without exception that the proposed GCL meets the requirements of the specification. The same testing shall be carried out on samples taken from site during the construction process and sent to an independent geosynthetics laboratory for conformance testing.

Table PS4.1: GCL Testing

			M Q TESTING (m²)	TEST METHOD
GEOTEXTILE COVER LAYER	PP non-woven white	g/m²	4 000	ASTM D5261
GEOTEXTILE CARRIER LAYER	PP slit film woven	g/m²		
	PP non-woven white	g/m²		
	Composite	g/m²		
BENTONITE LAYER	Quality	Montmorillonite content > 75%, Sodium Cation Na ⁺ > 60%		
(Bentonite mass at 0% moisture content)	Sodium Bentonite Powder	g/m²	4 000	ASTM D5993
	Swell index	ml/2g	Per 50 tonnes	ASTM D5890
GCL MASS PER UNIT AREA		g/m²	4 000	ASTM D5993
BONDING PROCESS		Fully Needle-punched and thermally locked		
GRAB STRENGTH	Machine	N	4 000	ASTM D4632
	Across	N		
CBR BURST	Strength	N	20 000	ISO 12236
	Elongation	%		
HYDRAULIC CONDUCTIVITY		m/s	25 000	ASTM D5887
PEEL STRENGTH		N/m	4000	ASTM D6496

Notes:

- 1) Minimum Average Roll Values (MARV) are reported unless otherwise stated.
- 2) A high shear grade GCL is required for this Contract.

PS 04.2 Quality Control

- a) The GCL shall be tested for compliance with conformance with the GRI GCL3 and GRI GCL5 as amended Standard specifications and the Project Specifications by the test methods indicated on the material specification. 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. GCL's produced on a line that is not equipped with on-

line needle detection facilities will not be considered for acceptance. Candidate GCL materials may be tested and pre-approved at the manufacturing location.

- b) The GCL manufacturer shall issue Quality Control Certificates to the Project Engineer, CQA Inspector or other designated party for each delivery of material. The certifications shall be signed by the quality control manager of the GCL manufacturer or other responsible party and shall include the following information:
- Shipment Packing List. A list indicating the rolls shipped on a particular truckload.
 - Bill of Loading. The shipping documents for the truck used for the shipment.
 - Letter of Certification. The letter indicating the material is in conformance with the physical properties specified.
 - Physical Properties Sheet. The material specification for the GCL supplied in accordance with this specification.
- c) Manufacturer Quality Control Submittal. The GCL manufacturer shall issue Quality Control submittals to the Project Engineer, CQA Inspector or other designated party for each lot of material if necessary. The submittals shall include the following information:
- i) Bentonite Manufacturer Certification. Bentonite manufacturer quality documentation for the particular lot of clay used in the production of the rolls delivered.
 - ii) Geotextile Manufacturer Certification. Geotextile manufacturer quality control documentation for the particular lots of geotextiles used in the production of the rolls delivered.
 - iii) GCL Manufacturer Tracking List. Cross-referencing list delineating the corresponding geotextile and Bentonite lots for the materials used in the production of the rolls delivered.
 - iv) Manufacturing Quality Control Data. The manufacturing quality control test data indicating the actual test values.
- d) Packaging. 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.
- e) Roll Identification and Labelling. 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:
- i) Product name and grade
 - ii) Length and width of roll
 - iii) Total weight of roll
 - iv) Production lot number and individual roll number
- f) Any accessory Bentonite used for sealing seams, penetrations or repairs, shall be high-quality powdered Sodium Bentonite from a recognised producer.

PS 04.3 **Installation**

The following operational procedures are as specific as possible while recognising that the specific requirements of the project may necessitate minor modifications. Significant deviations from these procedures shall be pre-approved by the Project Engineer or other designated party.

A copy of the manufacturer's installation guidelines must be supplied to the CQA Officer and Engineer with the GCL product.

In addition to the manufacturer's installation guidelines, cognisance will be taken of the Standard Guide for Installation of Geosynthetic Clay Liners (ASTM D 6102-97).

- a) Shipping and Handling Equipment. The party responsible for unloading the GCL shall contact the supplier before shipment to determine the correct unloading methods and equipment if different from the pre-approved and specified methods.
- b) GCL's must be supported during handling to ensure worker safety and prevent damage to the product. Under no circumstances should 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.
- c) Suitable handling equipment is described below:
 - i) Spreader Bar Assembly. A spreader bar assembly shall include both 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.
 - ii) 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 should be at least 3.0 metres long and inserted to its full length into the roll core to prevent excessive bending of the roll when lifted.
 - iii) Roller Cradles. Roller cradles consist of two large diameter rollers spaced approximately 75mm apart, which both support the GCL roll and allow it to unroll freely. The use of roller cradles shall be permitted if the rollers support the entire width of the GCL roll.
 - iv) 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.

- d) GCL Inspection upon Delivery. Each roll shall be visually inspected when unloaded to determine if any packaging or material has been damaged during transit.
 - i) Rolls exhibiting damage shall be marked and set aside for close examination during deployment.
 - ii) Minor rips or tears in the plastic packaging shall be repaired with moisture resistant tape before being placed in storage to prevent moisture damage.
 - iii) 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.
 - iv) GCL rolls delivered to the project site shall be only those indicated on GCL manufacturing quality control certificates.
- e) Storage / Stockpiling / Staging. Storage of the GCL rolls shall be the responsibility of the installer 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.
 - i) 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.
 - ii) GCL's should be stored no higher than four rolls high, or limited to the height at which installation personnel may safely manoeuvre the handling apparatus. Stacks or tiers of rolls should be situated in a manner that prevents sliding or rolling by chocking the bottom layer of the rolls.
 - iii) An additional tarpaulin or plastic sheet shall be used over the stacked rolls to provide extra protection for GCL material stored outdoors.
 - iv) Bagged Bentonite material shall be stored under cover. Bags shall be stored on pallets or other suitably dry surfaces that will prevent pre-hydration.
- f) No horizontal joints shall be allowed on any slope during installation of the GCL.

The surfaces upon which the GCL is to be laid shall be suitable for the placement of GCL material, subject to the specification below.

PS 04.4 **Subgrade Preparation**

- a) Subgrades. The surface upon which the GCL material will be installed shall be inspected by the CQA inspector and certified by the earthworks Contractor to be in accordance with the requirements of this specification.
 - i) The subgrade soil shall be well graded containing less than 20% gravel 50mm in diameter.
 - ii) In applications where the GCL is the sole barrier and will be subjected to a hydraulic head that exceeds the confining stress, subgrade surfaces consisting of gravel or granular soils may not be appropriate due to their large void content. For these

applications, the top 150mm of the subgrade soil should possess a particle size distribution where at least 80% of the soil is finer than 0.2mm (#60 sieve).

iii) Site specific compaction requirements should be followed in accordance with the project drawings and specifications. At a minimum, the level of compaction should be such that no rutting is caused by installation equipment or other construction vehicles that traffic the area of deployment.

iv) The surfaces to be lined shall be smooth and free of any debris, vegetation, roots, sticks, sharp rocks, or other deleterious materials larger than 5mm in diameter, as well as free of any voids, large cracks or standing water.

v) Directly before deployment of the GCL, the subgrade shall be final-graded to fill remaining voids or desiccation cracks, and proof-rolled to eliminate sharp irregularities or abrupt elevation changes. The surfaces to be lined shall be maintained in this smooth condition.

vi) On a continuing basis, the project CQA inspector and site supervisor shall certify acceptance of the subgrade before GCL placement.

PS 04.5 Placement

GCL material shall be placed in general accordance with the procedures specified below.

- a) Panel Placement forms must be submitted to the Engineer and approved before commencement of the installation.
- b) GCL Orientation. In the absence of specific guidelines, GCL panels should be placed with the nonwoven side up on slopes to maximise shear strength characteristics.
- c) In 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 HDPE geoemembrane.
- d) GCL Panel Position. Where possible, all slope panels should be installed running down the slope, while panels installed in flat areas require no particular orientation.
- e) Panel Deployment. GCL materials shall be installed in general accordance with the procedures set forth in this section, subject to site specific conditions that would necessitate modifications.
- f) Deployment should proceed from the highest elevation to the lowest to facilitate drainage in case of precipitation.
- g) The GCL may be deployed on slopes by pulling by hand the material from a suspended roll, or securing a roll end into an anchor trench and unrolling each panel by hand while slowly moving backwards. The roll must not be allowed to roll down the slope freely without any form of restraint. All care must be taken not to damage the underlying geosynthetics, where applicable.

- h) 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. Slip-sheet may be used to facilitate positioning of the liner while ensuring the GCL is not damaged by underlying harsh surfaces. All care must also be taken not to damage the underlying geosynthetics, where applicable.
- i) Overlaps shall be a minimum of 300mm and be free of wrinkles, folds or “fish-mouths”.
- j) The Contractor shall only install as much GCL as can be covered at the end of each working day. Only those GCL panels that 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 temporary water-resistant sheeting until work commences again.
- k) Anchoring. All GCL material installed on slopes greater than 7h: 1v shall be anchored to prevent potential GCL panel movement.
- l) Standard Anchor. The GCL shall be placed into and across the base of the excavated trench, stopping at the back wall of the excavation.
- m) “Run-Out” Anchor. 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 Project Engineer before the use of this method.
- n) Overlap seams shall be a minimum of 300mm on panel edges and 300mm on panel ends.
- o) Bentonite paste manufactured in accordance with the GCL supplier’s specification should be placed between panels at a minimum rate of 900 grams per linear metre of seam. Where a product is claimed to be self-sealing along the edges, the manufacturer shall provide proof of this claim. This impregnation is to extend inward 500mm (minimum 300mm) from the edges of the roll, in the long direction.
- p) Detailing. 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.
- q) Cutting of the GCL should be performed using a sharp utility knife. Frequent blade changes are recommended to avoid damage to the geotextile components of the GCL during the cutting process.

- r) Although direct vehicular contact with the GCL is to be avoided, lightweight, low ground pressure vehicles (such as light weight loader with rubber wheels) may be used to facilitate the installation of the overlaying HDPE membrane.
- s) Care should be taken to minimise “dragging” the GCL. Slip-sheet maybe used to facilitate positioning of the liner while ensuring the GCL is not damaged by underlying harsh surfaces.
- t) Do not leave GM/GCL composite liners exposed to the atmosphere for extended periods of time (site and condition specific). Backfilling (as per the design specification) in a timely manner should be adequate to prevent movement of GCL due to shrinkage.

PS 04.6 **Damage Repair**

Before cover material placement, damage to the GCL shall be identified and repaired by the installer. Damage is defined as any rips or tears in the geotextiles, delamination of geotextiles or a displaced panel.

- a) Rip and Tear Repair (flat surfaces). Rips or tears may be repaired by completely exposing the affected area, removing all foreign objects or soil, and by then placing a patch cut from unused GCL over the damage (damaged material may be left in place), with a minimum overlap of 300mm on all edges.
- b) Accessory Bentonite paste should be placed between the patch edges and the repaired material at a rate of 900 grams per lineal metre of edge spread in a continuous 150mm wide fillet, 5mm thick.
- c) Rip and Tear Repair (slopes). Damaged GCL material on slopes shall be repaired by the same procedures above. However, the edges of the patch should also be adhered to the repaired liner with a suitable adhesive to keep the patch in position during backfill or cover operations.
- d) 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 above procedure.
- e) Premature Hydration. If the GCL is prematurely hydrated, the installer shall notify the QA/QC technician and Project 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, dependent upon the degree of damage.

PS 04.7 **Weather Conditions for Installation**

No GCL shall be installed during any rainfall, including light rainfall (<5mm / hr intensity). Heavy direct raindrop impact should also be avoided. Should a sudden and unforeseen rainfall event occur

during construction, the panels can be covered with a tarpaulin or plastic sheet if there is not enough time to complete the cover placement.

PS 05 GEOMEMBRANE

The contractor is to supply and install 1.5mm H.D.P.E smooth geomembrane liner manufactured in accordance with GRI-GM13 specifications. Smooth geomembrane is required on the Cell base and in the dams. The Cell side slopes require a 1,5mm double sided HDPE geomembrane with the coarser texturing facing downwards. The joining of the smooth to textured geomembrane is to take place 1m beyond the slope toe, on the floor of the cell, and not directly at the toe of the slope.

Installation of the geomembrane is to be done in accordance with SANS 10409 specification.

PS 05.1 For the purposes of this Project, all applicable conditions of GRI GM13 are to be met, in addition to the following conditions:

- i. Thickness to be nominal, not -5%, and the lowest individual thickness for any of the ten (10) values is to be -10%, as per ASTM D559.
- ii. Break elongation to be minimum 200%, as per ASTM D6693 Type IV.
- iii. Puncture resistance to be a minimum of 450N for 1.5mm and 600N for 2mm, as per ASTM D4833.
- iv. Standard OIT to be 200 minutes, as per ASTM D3895.
- v. HP OIT to be 600 minutes, as per ASTM D5885.
- vi. Larger Asperity Height - Minimum Asperity Height, as per ASTM D7466.
- vii. Smaller Asperity Height - Minimum Asperity Height, as per ASTM D7466.
- viii. Texturing is to be embossed.

PS 05.2 Conformance Testing

It is recognised that due to differences in the chemical constituents of materials making up the geomembrane liner, as well as the variations in the manufacturing process, the physical and chemical properties may vary. The tenderer shall thus submit the following data (Table below) and appropriate test results as specified to enable evaluations and comparisons of the materials to be made.

Table PS06-1: Geomembrane Conformance Testing

Property	Test Method	Unit	Testing Frequency
Nominal thickness variation	ASTM D5994 / SANS 1526 :2015	%	1 per 15 000m ²
Asperity Height (if applicable)	D 7466	mm	1 per 15 000m ²
Formulated Density	D 1505 / D792	g/cm ³	1 per 15 000m ²
Puncture Resistance	D 4833	N	1 per 15 000m ²
Tear Resistance	D 1004	N	1 per 15 000m ²
Tensile Stress at Yield	D 6693	kN/m	1 per 15 000m ²
Tensile Stress at Break	D 6693	kN/m	1 per 15 000m ²
Elongation at Yield	D 6693	%	1 per 15 000m ²
Elongation at Break	D 6693	%	1 per 15 000m ²
Stress Crack Resistance	D 9357	hr	per GRI GM10

Carbon Black Content	D 4218	%	1 per 15 000m2
Carbon Black Dispersion	D 5596	%	1 per 15 000m2
OIT – Standard Pressure	D 3895	min	1 per 15 000m2
OIT – High Pressure	D 5885	min	1 per 15 000m2
Oven aging at 85°C – Standard and High Pressure	D 5721, D 3895, D 5885	%	1 per 15 000m2
UV Resistance High Pressure OIT % retained after 1600 hrs	D 7238, D 5885	%	1 per 15 000m2

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.

PS 05.3 Submittals

Prior to geosynthetic installation, the following Geosynthetic Installer's Quality Control submittals shall be submitted to the Design Engineer to confirm that materials meet the Project Specifications.

- a) Geosynthetic material samples, name of Manufacturer, and minimum material specifications which shall include the Manufacturer's minimum physical properties of the material, test methods (SANS and ASTM Standards) used, and factory and site seaming methods
- b) Manufacturer's Quality Control Manual followed during the manufacturing process.
- c) The origin (supplier's name and production plant), identification (brand name and number) and material properties of the resin used to manufacture the product.
- d) Geosynthetics Installer's Quality Control Manual, for the installation and testing of the geosynthetic.
- e) Resume (Curriculum Vitae) of the Installer Superintendent, Master Seamer, and Seamers to be assigned to this project (geomembrane only).
- f) A copy of each of the Quality Control Certificates on each lot of resin issued by the resin Supplier for the specific material for this project. Geomembrane submittals shall include certification of the resin for extrusion welding rod.
- g) The result of quality control testing conducted on the resin used in manufacturing the specific material for this project.
- h) A listing which correlates the resin to the individual geosynthetic rolls and extruded materials.
- i) A copy of the geosynthetic roll Quality Control Certificates which shall be supplied at a minimum frequency of one (1) per every five thousand (5 000) square metres of geosynthetic material continuously produced and supplied to the project.
- j) The conformance testing frequency shall be at a rate of 1 per 15 000 square metres, or one sample per lot, whichever results in the greater number of conformance tests. Samples shall be taken across the entire width of the roll and shall not include the first metre. The samples shall be a minimum of 1 metre wide by the roll width and shall be submitted to the CQA Engineer.
- k) A panel layout drawing for geomembrane showing the proposed installation layout identifying field seams as well as any variance or additional details which deviate from the Project Drawings.
- l) A detailed installation schedule for the project.
- m) Certification that the extrusion welding rod to be used is comprised of the same resin type as the geomembrane to be used (geomembrane only).

Additional Submittals (In-Progress and at Completion).

- n) Geomembrane installation warranty.
- o) Daily written acceptance of subgrade surface.
- p) Low temperature seaming procedures, if applicable.
- q) Prequalification test seam samples.
- r) Field seam non-destructive test results.

- s) Field seam destructive test results.
- t) Daily field installation reports.
- u) Installation record drawing.

Noncompliance with this part of the specification may be considered sufficient grounds to reject the tender.

Samples that do not meeting the specified requirements shall result in the rejection of applicable rolls/panels. As a minimum, rolls/panels produced immediately prior to and immediately after the failed roll/panel shall be tested for the same failed parameter. Testing shall continue until a minimum of three successive rolls/panels on both sides of the original failing roll/panel pass the failed parameter.

PS 05.4 **Quality Control**

Manufacturer's Qualifications

The manufacturer of geomembrane of the type specified or similar product shall have at least five years' experience in the manufacture of such geomembrane. In addition, the geomembrane manufacturer shall have manufactured at least 1,000,000 m² of the specified type of geomembrane or similar product during the last five years.

Installer's Qualifications

- i. The Geomembrane Installer shall be the approved Manufacturer's Installer or a contractor approved by the Owner's Representative / CQA Officer to install the geomembrane.
- ii. The Installer shall demonstrate, to the Engineer's satisfaction, his/her competence in installing HDPE 1.5mm geomembrane material and 2mm geomembrane material.
- iii. All seaming, patching, other welding operations and testing shall be performed by qualified technicians employed by the Geomembrane Installer.

Geomembrane Installation Warranty

The Geomembrane Installer shall guarantee the geomembrane installation against defects in the installation and workmanship for 1 year commencing with the date of final acceptance.

PS 05.5 **Geomembrane Installation**

- a) The subgrade shall be prepared in accordance with the project specifications. The geomembrane subgrade shall be uniform and free of all sharp or angular objects that may damage the geomembrane prior to installation of the geomembrane.
- b) The Geomembrane Installer and Owner's Representative/CQA Officer shall inspect the surface to be covered with the geomembrane on each day's operations prior to placement of geomembrane to verify suitability.
- c) The Geomembrane Installer and Owner's Representative/CQA Officer shall provide daily written acceptance for the surface to be covered by the geomembrane in that day's operations. The surface shall be maintained in a manner, during geomembrane installation that ensures subgrade suitability.

- d) All subgrade damaged by construction equipment and deemed unsuitable for geomembrane deployment shall be repaired prior to placement of the geomembrane. All repairs shall be approved by the Owner's Representative/CQA Officer and the Geomembrane Installer. The definitions regarding damage, repair and the responsibilities of the contractor and Geomembrane Installer shall be defined in the preconstruction meeting.

Geomembrane Placement

- a) No geomembrane shall be deployed until the applicable certifications and quality control certificates listed in this Plan are submitted to and approved by the Owner's Representative/CQA Officer. Should geomembrane material be deployed prior to approval by the Owner's Representative/CQA Officer, it will be at the sole risk of the Geomembrane Installer and/or Contractor. If the material does not meet project specifications it shall be removed from the work area at no cost to the owner.
- b) The geomembrane shall be installed to the limits shown on the project drawings and essentially as shown on approved panel layout drawings.
- c) No geomembrane material shall be unrolled and deployed if the material temperatures are lower than five (5) degrees Celsius unless otherwise approved by the Owner's Representative/CQA Officer. The specified minimum temperature for material deployment may be adjusted by the Owner's Representative/CQA Officer based on recommendations by the manufacturer. Temperature limitations should be defined in the preconstruction meeting. Typically, only the quantity of geomembrane that will be anchored and seamed together in one day should be deployed.
- d) No vehicular traffic shall travel on the geomembrane other than an approved low ground pressure All-Terrain Vehicle or equivalent.
- e) Sandbags or equivalent ballast shall be used as necessary to temporarily hold the geomembrane material in position under the foreseeable and reasonably expected wind conditions. Sandbag material shall be sufficiently close-knit to prevent soil fines from working through the bags and discharging on the geomembrane. Sand filling to be approved by the Engineer prior to placing.
- f) Geomembrane placement shall not be done if moisture prevents proper subgrade preparation, panel placement or panel seaming. Moisture limitations should be defined in the preconstruction meeting.
- g) The Contractor shall only lay as much geomembrane as can be seamed by the end of each working day.

- h) Damaged panels or portions of the damaged panels, which have been rejected, shall be marked and their removal from the work area recorded.
- i) The geomembrane shall not be allowed to "bridge over" voids or low areas in the subgrade. In these areas, the geomembrane shall be installed so as to allow it to rest in intimate contact with the subgrade.
- j) Wrinkles caused by panel placement or thermal expansion should be minimised in accordance with Section 4.7 B.11. Wrinkle heights should not exceed 2 times the width of the wrinkle (i.e., $H < 2W$), as recommended by Toepfer G.W. (2015), *The Complete Field Guide to Ensuring Quality Geosynthetics Installation, Volume 1*. Should the wrinkle exceed this (during the time stipulated for placement of the cover material), remedial measures indicated by the CQA Engineer must be performed prior to placement of the cover material.
- k) Considerations on Site Geometry: In general, seams shall be oriented parallel to the line of the maximum slope. In corners and odd shaped geometric locations, the total length of field seams shall be minimised. Seams shall not be located at low points in the subgrade unless geometry requires seaming at such locations and if approved by the Owner's Representative/CQA Officer.
- l) Overlapping: The panels shall be overlapped prior to seaming to whatever extent is necessary to affect a good weld and allow for proper testing. In no case shall this overlap be less than 75mm.
- m) The method and equipment used to deploy the panels must not damage the geomembrane liner or the supporting subgrade surface.
- n) No personnel working on the geomembrane liner will wear shoes that can damage the geomembrane liner or engage in actions which could result in damage to the geomembrane liner.
- o) When using welding/seaming equipment, a protection sheet shall be placed on the geomembrane liner and used as a working surface. All tools and equipment shall be placed on this sheet when not in use.
- p) Adequate temporary loading and/or anchoring (i.e., sand bags, tyres), which will not damage the geomembrane liner, will be suitably placed to prevent wind lifting up the geomembrane liner.
- q) The geomembrane liner will be deployed with enough slack to allow for typical thermal effects. Measures should be taken to prevent and / or accommodate wrinkling of the geomembrane liner resulting from any possible dimensional instability.

- r) Any area of a panel seriously damaged (torn, twisted or crimped) will be marked and repaired in accordance with clauses elsewhere in of this specification.
- s) The use of steel pegs driven through the geomembrane liner, as a means of securing it in anchor trenches, will not be permitted.
- t) Irregular panels shall be cut so as to allow adequate overlaps for seaming.
- u) The geomembrane is to be covered as soon as possible after installation, to prevent extended exposure times. Exposure times are to be approved by the Owner's Representative/CQA Officer at the pre-construction meeting. If exposed geomembrane cannot be permanently covered timeously, it shall be temporarily covered to prevent thermal conductivity impacts.
- v) During the geomembrane placement, interface shear testing as per test method ASTM D5321 is to be undertaken, at a frequency (but no less than three (3) No. tests) and as directed by the Engineer on site, to verify/confirm that the minimum design shear strengths are being met.

Seaming Procedures

- a) No geomembrane material shall be seamed when the ambient temperature is below 5°C or above 45°C; if the temperatures are above 5°C but frost, ice, etc. is visible on the geomembrane then the overlap needs to be visually inspected and approved by the Owner's Representative/CQA Officer prior to the commencement of the pre-qualification test seam. If the ambient temperature is above 45°C, no seaming will commence.

The following conditions need to be complied with:

- i. The Geomembrane Installer shall submit to the Owner's Representative/CQA Officer for approval, detailed procedures for seaming at low temperatures, possibly including the following:
 - Preheating of the geomembrane.
 - The provision of a tent or other device if necessary, to prevent heat losses during seaming and rapid heat losses subsequent to seaming.
 - Number of test welds to determine appropriate seaming parameters.
- ii. Upon inspection if it is noted that there is ice, frost or moisture on the geomembrane overlap due to cold conditions, welding must be stopped until the geomembrane has defrosted sufficiently to be dried.
- b) No geomembrane material shall be seamed when the temperature of the geomembrane sheet is above 75°C as measured by an infrared thermometer or

surface thermocouple unless otherwise approved by the Owner's Representative/CQA Officer. This approval will be based on recommendations by the manufacturer and on a field demonstration by the Geomembrane Installer using prequalification test seams to demonstrate that seams comply with the specification.

- c) If seaming operations are conducted at night, lighting equipment shall be sufficient to allow the Installer and CQA Officer to adequately and safely perform their duties.
- d) Seaming shall primarily be performed using automatic fusion welding equipment and techniques. Extrusion welding shall be used where fusion welding is not possible, such as at pipe penetrations, patches, repairs and short (less than a roll width) runs of seams.
- e) Fishmouths or excessive wrinkles at the seam overlaps, shall be minimised and when necessary, cut along the ridge of the wrinkles back into the panel so as to effect a flat overlap. The cut shall be terminated with a keyhole cut (nominal 10 mm diameter hole) so as to minimise crack/tear propagation. The overlay shall subsequently be seamed. The keyhole cut shall be patched with an oval or round patch of the same base geomembrane material extending a minimum of 150 mm beyond the cut in all directions.
- f) The panels of the geomembrane liner shall be overlapped by 150mm prior to welding.
- g) The seam area must be cleaned prior to seaming to ensure the area is clean and free of moisture, dust, dirt, or debris of any kind.
- h) The panels must be adjusted so that seams are aligned with the fewest possible number of wrinkles and "fishmouths".
- i) When extrusion welding is required:
 - Whenever possible, the sheets shall be bevelled prior to heat tacking commencement.
 - The panels of the geomembrane liner shall be overlapped a minimum of 75mm.
 - Using a hot air device, the panels of the geomembrane liner to be welded should be temporarily tacked, taking care not to damage the geomembrane liner by overheating.
 - The seam area must be cleaned prior to seaming to assure the area is clean and free of moisture, dust, dirt and debris of any kind.
 - The seam overlap should be ground prior to welding within one (1) hour of the welding operation in a manner that does not damage the geomembrane liner. Grind marks should be covered with extrudate whenever possible. In all cases,

grinding should not extend more than 5mm past the edge of the area covered by the extrudate during welding.

- The extruder should be purged prior to beginning the seam in order to remove all heat degraded extrudate from the barrel and care should be taken not to dispose of hot extrudate on the geomembrane liner.
- The welding rod should be kept clean and dry.

Pipe and Structure Penetration Sealing System

- a) Provide penetration-sealing system as shown in the Project Drawings.
- b) Penetrations shall be constructed from the base geomembrane material, flat stock, prefabricated boots, and accessories as shown on the Project Drawings. The prefabricated or field fabricated assembly shall be field welded to the geomembrane as shown on the Project Drawings so as to prevent leakage. This assembly shall be tested as outlined in section 4.13.5 b). Alternatively, where field non-destructive testing cannot be performed, attachments will be field spark tested by standard leak detectors in accordance with ASTM 6365.
- c) Spark testing should be done in areas where both air pressure testing and vacuum testing are not possible.
 - i) Equipment for spark testing shall be comprised of, but not limited to: A handheld holiday spark tester and conductive wand that generates a high voltage.
 - ii) The testing activities shall be performed by the Geomembrane Installer by placing an electrically conductive tape or wire beneath the seam prior to welding (if necessary). A trial seam containing a non-welded segment shall be subject to a calibration test to ensure that such a defect (non-welded segment) will be identified under the planned machine settings and procedures. Upon completion of the weld, enable the spark tester and hold approximately 25mm above the weld moving slowly over the entire length of the weld in accordance with ASTM 6365. If there is no spark, the weld is considered to be leak free.
 - iii) A spark indicates a hole in the seam. The faulty area shall be located, repaired, and retested by the Geomembrane Installer.
 - iv) Care should be taken if flammable gases are present in the area and the gases are to be tested.

PS 05.6 Field Quality Control

The Owner's Representative/CQA Officer shall be notified prior to all prequalification and production welding and testing, or as agreed upon in the preconstruction meeting.

- a) Prequalification Test Seams

- i. Test seams shall be prepared and tested by the Geomembrane Installer to verify that seaming parameters (speed, temperature and pressure of welding equipment) are adequate.
- ii. Test seams shall be made by each welding technician and tested in accordance with ASTM D 4437 at the beginning of each seaming period. Test seaming shall be performed under the same conditions and with the same equipment and operator combination as production seaming. The test seam shall be a minimum of 3.3 m long for fusion welding and 1 m long for extrusion welding with the seam centred lengthwise.
- iii. The Installer shall perform pre-weld testing at the beginning of each crew shift and immediately following any work stoppage (e.g., for lunch, weather, etc.) of 30 minutes or more. Seaming operation shall not commence until the CQA Officer has determined that the seaming process meets the Project Specifications.
- iv. Three 25 mm wide specimens shall be cut by the Geomembrane Installer from the test seam. These specimens shall be tested by the Geomembrane Installer using a field tensiometer testing both tracks for peel strength and also for shear strength. Each specimen shall fail in the parent material and not in the weld, "Film Tear Bond" (FTB failure). Seam separation equal to or greater than 10% of the track width shall be considered a failing test.
- v. The minimum acceptable seam strength values to be obtained for all specimens tested are listed in subsection 4.13.5 c) iv) of this Section. All four specimens shall pass for the test seam to be a passing seam.
- vi. If a test seam fails, an additional test seam shall be immediately conducted. If the additional test seam fails, the seaming apparatus shall be rejected and not used for production seaming until the deficiencies are corrected and a successful test seam can be produced.
- vii. A 300mm sample from each test seam shall be labelled. The label shall indicate the date, geomembrane temperature, number of the seaming unit, technician performing the test seam and pass or fail description. The sample shall then be given to the Owner's Representative/CQA Officer for archiving.
- viii. The CQA Officer shall record the trial seam test results on a trial seam log form.
- ix. Table 1(b) below shows the required parameters for the peel & shear tests on both hot wedge welding and extrusion fillet welding.

Table 1(b) – Seam Strength and Related Properties of Thermally Bonded **Smooth and Textured** High Density Polyethylene (HDPE) Geomembranes (**S.I. Units**)

Geomembrane Nominal Thickness	0.75 mm	1.0 mm	1.25 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm
Hot Wedge Seams ⁽¹⁾							
shear strength, N/25 mm.	250	350	438	525	701	876	1050
shear elongation at break ⁽²⁾ , %	50	50	50	50	50	50	50
peel strength, N/25 mm	197	263	333	398	530	661	793
peel separation, %	25	25	25	25	25	25	25
Extrusion Fillet Seams							
shear strength, N/25 mm	250	350	438	525	701	876	1050
shear elongation at break ⁽²⁾ , %	50	50	50	50	50	50	50
peel strength, N/25 mm	170	225	285	340	455	570	680
peel separation, %	25	25	25	25	25	25	25

b) Field Seam Non-destructive Testing

- i. All field seams shall be non-destructively tested by the Geomembrane Installer over the full seam length before the seams are covered. Each seam shall be numbered or otherwise designated. The location, date, test unit, name of tester and outcome of all non-destructive testing shall be recorded and submitted to the Owner's Representative/CQA Officer.
- ii. Testing should be done as the seaming work progresses, not at the completion of all field seaming, unless agreed to in advance by the Owner's Representative / CQA Officer. All defects found during testing shall be numbered and marked immediately after detection. All defects found should be repaired, re-tested and remarked to indicate acceptable completion of the repair.
- iii. Non-destructive testing shall be performed using vacuum box, air pressure or spark testing equipment.
- iv. Non-destructive tests shall be performed by experienced technicians familiar with the specified test methods. The Geomembrane Installer shall demonstrate to the Owner's Representative/CQA Officer all test methods to verify the test procedures are valid.
- v. Extrusion seams shall be vacuum box tested by the Geomembrane Installer in accordance with ASTM D 4437 and ASTM D 5641 with the following equipment and procedures:
 - Equipment for testing extrusion seams shall be comprised of, but not limited to: a vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft rubber gasket attached to the base, porthole or valve assembly and a vacuum gauge; a vacuum pump assembly equipped with a pressure controller and pipe connections; a rubber pressure/vacuum hose with fittings and connections; a plastic bucket; wide paint brush or mop; and a soapy solution.
 - The vacuum pump shall be charged and the tank pressure adjusted to approximately 35 kPa (5 psig).
 - The Geomembrane Installer shall create a leak tight seal between the gasket and geomembrane interface by wetting a strip of geomembrane approximately 0.3m by 1.2m (length and width of box) with a soapy

solution, placing the box over the wetted area, and then compressing the box against the geomembrane. The Geomembrane Installer shall then close the bleed valve, open the vacuum valve and maintain initial pressure of approximately 35 kPa for approximately 5 seconds. The geomembrane should be continuously examined through the viewing window for the presence of soap bubbles, indicating a leak. If no bubbles appear after 5 seconds, the area shall be considered leak free. The box shall be depressurised and moved over the next adjoining area with an appropriate overlap and the process repeated.

- All areas where soap bubbles appear shall be marked, repaired and then retested.
 - At locations where seams cannot be non-destructively tested, such as pipe penetrations, alternate non-destructive spark testing (as outlined in section 4.13.4 b)) or equivalent should be substituted.
 - All seams that are vacuum tested shall be marked with the date tested, the name of the technician performing the test and the results of the test.
- vi. Double fusion seams with an enclosed channel shall be air pressure tested by the Geomembrane Installer in accordance with ASTM D 5820, ASTM D 4437 and the following equipment and procedures:
- Equipment for testing double fusion seams shall be comprised of, but not limited to: an air pump equipped with a pressure gauge capable of generating and sustaining a pressure of 30-35 kPa mounted on a cushion to protect the geomembrane; and a manometer equipped with a sharp hollow needle or other approved pressure feed device.
 - The Testing activities shall be performed by the Geomembrane Installer. Both ends of the seam to be tested shall be sealed and a needle or other approved pressure feed device shall be inserted into the tunnel created by the double wedge fusion weld. The air pump shall be adjusted to a pressure of 30-35 kPa, and the valve closed. Allow 2 minutes for the injected air to come to equilibrium in the channel and sustain pressure for 5 minutes. If pressure loss does not exceed 3 kPa after this five-minute period, the seam shall be considered leak tight. Release pressure from the opposite end verifying pressure drop on needle to ensure testing of the entire seam. The needle or other approved pressure feed device shall be removed and the feed hole sealed.
 - If loss of pressure exceeds 3 kPa during the testing period or pressure does not stabilise, the faulty area shall be located, repaired and retested by the Geomembrane Installer.
 - Results of the pressure testing shall be recorded on the liner at the seam tested and on a pressure testing record.

c) Destructive Field Seam Testing

- i. One destructive test sample per 150 linear metre seam length of each seaming apparatus or another predetermined length in accordance with GRI GM 14 shall be taken by the Geomembrane Installer from a location specified by the Owner's Representative/CQA Officer. The Geomembrane Installer shall not be informed in advance of the sample location. In order to obtain test results prior to completion of geomembrane installation, samples shall be cut by the Geomembrane Installer as directed by the Owner's Representative/CQA Officer as seaming progresses.
- ii. All field samples shall be marked with their sample number and seam number. The sample number, date, time, location and seam number shall be recorded. The Geomembrane Installer shall repair all holes in the geomembrane resulting from obtaining the seam samples. All patches shall be vacuum box tested or spark tested. If a patch cannot be permanently installed over the test location the same day of sample collection, a temporary patch shall be tack welded or hot air welded over the opening until a permanent patch can be affixed.
- iii. The samples shall be taken centred over the seam and prioritized as follows:
 - All areas identified as suspect during non-destructive testing/monitoring
 - Seams that appear suspect to the CQA Officer
 - A minimum of one sample per day
 - A minimum of one sample for each geomembrane seaming apparatus
 - A minimum of one sample for each representative working conditions (e.g. weather condition)
 - A minimum of one sample every 150 metres of seaming for each apparatus
- iv. Two types of samples shall be obtained at each location. The first sample shall consist of two specimens, each cut approximately 25 mm wide by 200 mm long, taken 1 m apart. These specimens shall be tested for peel and shear strength in the field by the Installer using a calibrated field tensiometer capable of quantitatively measuring peel and shear strengths. The CQA Officer shall observe all field tests and record the test results.
- v. If one or both of the specimens fail, the Installer shall take additional test samples 3m from the point of the failed test in each direction and repeat the field test procedure. If these additional tests fail, then the procedure shall be repeated until the length of the poor-quality seam is established.
- vi. If the initial field tests pass, the second type of sample shall be taken between the passing specimens. The second sample type shall be approximately 1 m along and 300 mm across.

The sample shall be divided into three equal sections and distributed and tested as follows:

- One sample - Manufacturer/Installer for their use
 - One sample - CQA Officer for destructive testing
 - One sample - CQA Officer for site archives
- vii. Each sample shall be subject to the following destructive tests at a GRI-LAP accredited CQA geosynthetics laboratory (or similar approved by CQA Officer) or at the CQA Site Office and tested per ASTM D6392 with appropriate calibrated equipment:
- Seam shear strength (five tests)
 - Seam peel strength (five tests)
- viii. For fusion seams, one peel strength test refers to testing of both sides of the seam. A passing test must have all five passing tests for the shear test and peel test.
- ix. Failed destructive tests shall be subject to additional testing until a passing area is found. The Installer shall take another test sample 3 m from the point of the failed test in each direction and repeat the field test procedure. If subsequent tests fail, then the procedure is repeated until the length of the poor-quality seam is established. Once the field tests have passed, a second sample shall be taken between the passing specimens and tested by the Independent CQA Laboratory.
- x. Failed seams shall be tracked according to the welding apparatus and the machine operator. All failed seams shall be bounded by locations from which passing Independent CQA Laboratory tests have been taken.
- xi. The Installer shall be responsible for patching all areas cut for test samples in accordance with the Project Specifications and the Manufacturer's recommended procedures, and for non-destructive testing (e.g., vacuum box, spark testing etc.) of the patched seams. The CQA Officer shall record all test locations, results, actions taken in conjunction with destructive test failures, and repairs.
- xii. Daily Field Installation Reports: At the beginning of each day's work, the Installer shall provide the Engineer with daily reports for all work accomplished on the previous workday. Reports shall include the following:
- Total amount and location of geomembrane placed.
 - Total length and location of seams completed, name of technicians doing seaming and welding unit numbers.
 - Results of prequalification test seams.
 - Results of non-destructive testing.
 - Results of vacuum testing of repairs.

PS 05.7 Construction Quality Assurance

The engineer, or his representative, shall have full access to all test results carried out by the contractor. In addition, he shall be entitled to be present whenever such tests are carried out.

Should it be deemed necessary, additional tests may be called for by the engineer and the contractor shall give full co-operation in obtaining samples for such tests.

The CQA Officer shall approve areas of the geomembrane prior to coverage of the geomembrane by other materials. Acceptance of areas shall follow these procedures:

- i. As-built panel layout survey
- ii. Full documentation of all seams
- iii. Full documentation of non-destructive testing on all seams and repairs
- iv. Full documentation of repairs on all defects
- v. Full documentation of passing destructive tests
- vi. A final "walk-over" of the area to observe any subsequent damages or non-addressed items
- vii. All submittals required by the CQA Plan or the Project Specifications.

PS 06 NON-WOVEN GEOTEXTILE FOR PROTECTION

The supply and installation of Non-woven, Needle-punched geotextile, with nominal mass 1000g/m² - as liner protection below stone leachate collection layer and over sump stone and riser pipe stone cover material- is to be in accordance with the specifications below.

Geotextile is to be manufactured in accordance with GRI-GT12(a) specifications.

PS 06.1 Conformance Testing

The geotextile manufacturer shall provide production test certificates for rolls delivered to site demonstrating that the test values specified for the proposed product have been attained. Test methods employed shall be in accordance with those stated below unless otherwise agreed by the CQA Engineer.

Certificates relevant to a batch of geotextile shall be furnished to the CQA Engineer prior to that batch of geotextile being incorporated in the works.

Table 6.1: Geotextile Testing

Property	Test Method SANS / ASTM	Unit	Testing Frequency
Thickness (at 2kPa)	SANS 9863:13	mm	1 per 15 000m ²
Mass per	SANS 10221:07	g/m ²	1 per 15 000m ²
Tensile Strength – 200mm wide strip (weaker direction)	SANS 1525:13	kN/m	1 per 15 000m ²
CBR Puncture Strength	SANS 12236:13	kN	1 per 15 000m ²
Puncture Resistance Diameter of hole (max)	SANS 13433:13	mm	1 per 15 000m ²

The Contractor shall also conduct conformance testing at the frequencies detailed in Table 6.1 above or one sample per lot, whichever results in the greater number of conformance tests. Samples shall be 1.0m wide by the width of the roll and shall not include the first metre.

Samples shall be split into three: 1 No. for the CQA Engineer, 1 No. for the Contractor and 1 No. for conformance testing. The Contractor shall supply prior to commencement of the works a statement of which geosynthetic laboratory he proposes to use.

All of the parameters listed in Table 6.1 above will be tested to ensure the material is in accordance with the quoted Test Values. The Contractor shall supply to the CQA Engineer a copy of the laboratory test results immediately on receipt. If testing shows that the geotextile is not in accordance with any one of the quoted Test Values, then this may be cause for rejection of the material from the works.

PS 06.2 Plant

The Contractor will be required to provide plant specific to the geotextiles and geosynthetics used to prevent damage and/or reduction of the geotextiles and geosynthetics properties specified.

Due to the nature of the geosynthetics, "Bobcat" compact track like plant will need to be used to prevent damage of the geosynthetics during the installation thereof and the construction and installation of the layers above. The Contractor is to ensure that the plant utilized for the spreading of aggregate is not to exceed 5 tonnes operating weight and is to be track mount plant. The proposed plant is to be submitted to the engineer prior to placement of aggregate for written approval.

PS 06.3 Construction

Handling and Placement

The installer's personnel shall handle the geotextiles in such a manner as to minimize damage and shall comply with the following:

- a) A copy of the manufacturer's installation guidelines must be supplied to the CQA Officer and Engineer with the geotextile.
- b) The geotextile shall be delivered to site in rolls covered with an opaque plastic sheet to prevent damage from sunlight and should be stored as per the supplier's specification.
- c) Panel Placement forms must be submitted to the Engineer and approved before commencement of the installation.

- d) The method of installation shall ensure that the geotextile is in continuous contact with the surface subgrade. The geotextile shall not be stretched or bridged over hollows or humps.
- e) On slopes, the geotextile shall be securely anchored and then rolled down the slope in such a manner as to keep the geotextile panel in tension.
- f) No horizontal joints shall be allowed on any slope during installation of the geotextile.
- g) The geotextile shall be held in place with sandbags to prevent wind uplift. Sandbags shall be installed during the placement and shall remain until replaced with the overlying layer/s. Sandbags shall be filled with fine grained material and must be handled with care to prevent rupture.
- h) Geotextiles shall be kept continually under tension to minimize to presence of wrinkles in the geotextile.
- i) Care should be taken not to drag the geotextile on the HDPE geomembrane and the leachate drainage layer, as this could damage the material.
- j) Where the geotextile is being placed onto the geomembrane and underlying geosynthetics, it shall be deployed by hand so as not to damage the geomembrane and geosynthetics in any way. Special care shall be taken by the Installer to prevent damage of the geomembrane and underlying geosynthetics.
- k) Geotextiles shall be cut using an approved geotextile cutter only (i.e., upward cutting hook blade).
- l) After installation, the entire surface of the geotextile shall be examined, and harmful foreign objects, shall be removed.
- m) A minimum thickness of 300mm of cover shall be kept between heavy equipment and the geotextile at all times.
- n) No construction traffic shall be allowed directly on any of the laid geotextile.
- o) All laid and approved geotextile is to be covered within fifteen (15) days to prevent damage due to UV exposure.

Seams and Overlap

- a) Overlap widths are site specific and generally at the discretion of the CQA engineer.

- b) On side slopes, the geotextile shall be securely anchored in the anchor trench, then unroll to prevent wrinkles and folds. End of roll overlaps shall be lapped upslope over down slope, and the overlap shall be a minimum of 300mm. Adjacent end of roll overlaps (down slope) should be offset by a minimum of 200mm.
- c) All rolls (placed alongside one another or end-on-end) shall overlap by a minimum of 300mm or be sewn with a polyester thread or shall be heat bonded along overlapping edges, or all three methods, as per the supplier's specification.
- d) For curves, the geotextile should be folded or cut and overlapped in the direction of the turn (previous geotextile on top).

PS 06.4 Repairs

- a) Holes in the geotextile shall be patched with geotextile of the same unit weight and material.
- b) Sufficient overlap shall be provided to ensure that a suitable thermal seam can be produced, that will not come apart and, when used as a filter, will contain soil.
- c) Patches shall be placed over the damaged area and extend 200mm beyond the perimeter of the damaged area and be thermally bonded.
- d) Care shall be taken to remove any soil or other material which may have penetrated the torn geotextile.

The Contractor shall submit a summary of the manufacturer's qualifications and a copy of the manufacturer's quality control manual together with the Tender Document. The geotextile manufacturer shall provide a qualified and experienced representative to be available on an as needed basis during construction. The representative shall visit the site for consultation at least twice during construction, or as requested by the Contractor.

One properly identified 600 by 600 mm minimum size geotextile sample is to be submitted at the beginning of the Contract. The geotextile sample is intended for visual demonstration prior to product delivery.

PS 07 NON-WOVEN GEOTEXTILE FOR SEPARATION

The supply and installation of Non-woven, Needle-punched geotextile, with minimum nominal mass 200g/m² - as a separation layer- is to be in accordance with the specifications under PS 06.1 to PS 06.4. Throughflow to be minimum 100 l/s/m² under 100mm head.

Manufacture of separation geotextile is to be in accordance with GRI-GT13(a).

PS 08 WOVEN GEOTEXTILE FOR SEPARATION

The Woven geotextile to be installed as separation/drainage layer above leachate collection layer. The geotextile is to have with a nominal mass of 200g/m² and throughflow of at least 50 l/s/m² under 100mm head. The woven geotextile is to be handled and installed in accordance with Particular Specifications PS 06.2 to PS 06.4.

PS 09 WOVEN TAPE CELLULAR LATTICE STRUCTURE GEOTEXTILE (OR GEOCELLS)

Supply and installation of 100mm thick woven tape cellular lattice structure geotextile filled with 5 Mpa concrete. Concrete to be included in rate.

PS 09.1 Construction

- a) Geocells to be constructed from the base section upwards to the channel crest. Geocells to be spread out on the base and slopes by means of sufficiently weighted sandbags and rope used to stretch the geocells to their functioning position.
- b) It is recommended that a long bar / rod be used to tension long sections of geo-cells at a time (to be weighted down by sandbags filled with fine graded materials to the Engineers approval).
- c) 5 MPa Concrete to be placed inside the cells only once sufficiently taut / tensioned.
- d) **Steel pegs and binding wire may NOT be used for rigging of the geo-cells.**
- e) It is essential that the Contractor ensures that the cells are rigged extremely taut. Rigging strings are not to be omitted. Rigging and weighting of the cells are required to prevent collapse of the cells during filling, to prevent the cells floating on the concrete and to ensure an intimate contact of the cells with the base.
- f) Geocells to be 100mm thick, not be used in conditions that exceed their design specifications and shall be UV resistant.

PS 10 CUSPATED DRAIN (GEO-COMPOSITE DRAINAGE LAYER)

Supply and install Cuspated Drain with a minimum core height of 7mm under load with geotextile backing heat bonded to cusps to prevent intrusion into drainage cores.

PS 10.1 Conformance Testing

The conformance testing frequency shall be at a rate of 1 per 15 000 square metres, or one sample per lot, whichever results in the greater number of conformance tests.

Samples shall be taken across the entire width of the roll and shall not include the first metre. The samples shall be a minimum of 1 metre wide by the roll width. The CQA Engineer shall mark the machine direction and roll number on the sample, and date the sample was obtained and forward the sample to the independent geosynthetic laboratory for conformance testing.

Geocomposite Installation Warranty

The geocomposite Installer shall guarantee the geocomposite installation against defects in the installation and workmanship for 1 year commencing with the date of final acceptance.

PS 10.2 Installation

- a) Where possible, geocomposites should be deployed continuously down slopes. If the slope is too long and end joining becomes necessary, joining may be done using plastic ties (300mm).
- b) Edge-to-edge placement shall be conducted and ties should be 1.5 meters o.c. The geotextile flap (upper geotextile layer) shall cover the edge-to-edge joint and shall be heat spot-tacked 600mm or per project specifications.
- c) Under no circumstances shall geocomposites' drainage components be overlapped unless required by project specifications or manufacturers installation recommendations.
- d) The components of the geocomposite (e.g., geotextile-geonet-geotextile) are not bonded together at the ends and edges of the rolls. The CQA Officer will document that the geocomposite is overlapped and secured or seamed in accordance with the Technical Specifications.
- e) Geocomposite layers are to terminate 300mm into the respective drainage sumps.

- PS 10.3 Repairs**
- a) Any holes or tears in the geocomposite must be repaired in accordance with the Technical Specifications, and the repairs must be verified by the CQA Officer.
- PS 11 TREATMENT OF SUBGRADE UNDER BARRIERS**
- 150mm in-situ subgrade preparation and compaction of materials to a minimum of 93% modified AASHTO maximum density including ripping, watering, shaping and compaction of in-situ materials in the cell or dam as shown on drawings.
- The contractor shall be responsible for preparing and maintaining the base preparation layer and in a condition suitable for the installation of the geomembrane liner or GCL, as applicable. The geomembrane/ GCL subgrade shall be uniform and free of all sharp or angular objects that may damage the geomembrane prior to installation of the geomembrane / GCL. Specifications PS04.4 and PS 05.5 shall apply respectively.
- PS 12 SUMP RISER PIPE**
- Supply and installation of 250mm diameter (Φ) PE 100 PN 12.5 riser pipes for leakage detection to include all fittings. Details to leak detection monitoring manhole as shown on drawings.
- PS 13 LEACHATE COLLECTION PIPES**
- Supply and install 160mm diameter (Φ) double walled corrugated HDPE pipe with slotted perforations and ring stiffness > 450 kPa - in the leachate collection layer to include all couplings, bends etc. SANS ISO 4427 to apply.
- PS 14 LEAKAGE DETECTION PIPES**
- Supply and install 110mm diameter (Φ) double walled corrugated HDPE pipe with slotted perforations and ring stiffness > 450 kPa - in the leachate collection layer to include all couplings, bends etc. SANS ISO 4427 to apply.
- PS 15 PRE-FABRICATED HDPE MANHOLES**
- Pre-fabricated HDPE manholes 1200mm diameter (Φ), wall thickness of 20mm including base end cap, extrude welded, complete with HDPE step irons and removable cover and frame for leachate leak detection and collection.
- PS 16 CONCRETE FOOTING FOR HDPE MANHOLE**
- 1,5 x 1,5m concrete footing for manhole, 200 thick 25 MPa with 1 layer mesh reference 193 reinforcement (placed centrally), to be cast in situ on 20mm sand blinding layer.
- PS 17 EMERGENCY OVERFLOW**
- Construct emergency overflow comprising excavating, shaping and compacting sub-grade to minimum 93% Mod AASHTO. Concrete to be 100mm thick 25 Mpa concrete, with 1 layer mesh reference 193 reinforcement (placed centrally) and concrete expansion joints every linear 4 meters up to head wall of culvert per drawing ES-754-2022-029-A. Concrete to be cast in-situ on 20mm sand blinding layer. Concrete culvert and headwalls to be measured elsewhere.
- PS 18 CONCRETE PIPE CULVERTS**
- All pipes to be 100D concrete interlocking joint type pipes to SABS 677 with a minimum of 600mm cover. Specification PSLE 3.1 to apply with respect to Engineer's approval.
- PS 19 PERIMETER FENCE: CLEARVIEW**
- Supply and install 2400mm high black PVC coated Clearview Wiretech fence with square posts including spiked top flat bar and 23-strand Electric fence 'piggy-backed' with aluminium rail on

inside face. Rate to include all pvc bobbins, wiring, energiser, safety signs and 25 Mpa concrete footing and footing excavation complete- to match existing fence.....m

PS 20 PERIMETER FENCE: RAZOR MESH

Supply and install 2400mm high HDG Razor diamond mesh fence 300X150mm including flat wrap razor coil fixed to top with 100mmDia HDG corner and strain post with 50mm stays, planted 600mm deep in 20Mpa concrete, 'Y' dropper standard planted n.e 4m apart, 4 x HDG strain wires etc complete.....m

PS 21 INTERNAL FENCE: RAZOR MESH

Supply and install 1800mm high HDG diamond mesh fence with 100mmDia HDG corner and strain post with 50mm stays, planted 600deep in 20Mpa concrete, 'Y' dropper standard planted n.e 4m apart, 4 x HDG strain wires etc complete.....m

PS 22 PERIMETER FENCE GATES

Supply and install new 12m wide heavy duty non-motorized sliding gates as per drawing, including sliding rail concreted in-situ, stand posts and guide posts complete. To suit Fence.sum

PS 23 INTERNAL FENCE GATES

Supply and install new double leaf HDG access gates to suit 1800mm HDG diamond mesh fence.

a) 4.5m wide HDG double leaf gates.....No.

PS 24 TOPSOIL PLACEMENT

Unless noted otherwise on the drawings, topsoil to landscaped areas and side slopes to be 100mm thick, placed from the lowest area working upslope.....m²

PS 25 CREST SAND PROTECTION LAYER

A soil protection layer 500mm thick to be placed on perimeter berm crest. To be placed in layers not exceeding 200mm thick and nominally compacted. No heavy equipment to be driven on the berm crest. Soil material to be approved by the Engineer on site, and should not contain any boulders, or stones larger than 75mm.

PS 25 SEPTIC TANK

Double chamber septic tank 4m x 1.5m x 2.2m deep in 230mm brickwork on mesh (one layer ref. 395) reinforced 30 MPa concrete base 150mm thick. 150mm thick cover slab, with two 600 x 600 openings, to be reinforced concrete with 1 layer mesh ref 395. 2 cast iron manhole lid and frames cast in- SABS 558 Type 9B or similar approved by the Engineer. 110mm uPVC inlet and outlet pipes. Outlet to percolation trench.

Price to include percolation trench 1m deep x 500mm wide backfilled with gravel around perforated HDPE pipe or pitch fibre pipe 110 mm diameter. Gravel size 38mm to 53mm. Length of trench to be priced at 20m long. There should be a 1m wide by 0,5m deep 70/150mm packed stone pit at end of trench, below trench invert.

Price to include a junction manhole 2m from tank inlet. Manhole to be precast concrete 675mm inside diameter on 1,5m diameter concrete base. Manhole cover and frame SABS 558 Type 4 or similar approved round cover. Allow for two inlets to manhole, and one outlet, all 100mm uPVC. All backfilling included.....Lump Sum

PS 26 SOLAR ELECTRICAL SUPPLY

Allow for wiring of solar electricity connection for three phase electrical supply to Offices and Workshop including supply cables, termination and testing etc.

Supply and install solar equipment including panels, panel mounting, 8Kva inverter-controller and 2 x 10Kw lithium Iron batteries.

PS 27 WEATHER STATION

A solar powered weather station, with backup battery and optional wi-fi connectivity is to be supplied and installed that will measure and digitally record and store the following information:

- Wind speed
- Wind direction
- Temperature
- Humidity
- Barometric pressure

The tendered price to include display console, mounting pole, calibration and installation. The weather station is to be sourced locally from a supplier that provides a warranty and backup support. The mounting is to be galvanised metal pipe minimum 75mm diameter, set in 25 MPa concrete for a minimum depth of 300mm. Height to manufacturer's specification. The positioning of the station is to be approved by the Engineer.

PS 29 WASHBAY

Installation of modular wash bay including concrete base slab approximately 12m x 4m x 150mm thick with 2 layers mesh ref 245. Side precast concrete channels to collect runoff, each discharging into a cast in-situ concrete sump of size 750mm x 750mm x 500mm deep with metal gratings over channels and sumps.....P/sum

PS 30 INDEPENDENT ELECTRIC LEAK LOCATION TESTING: ARC TESTING

Overview

The arc testing method is generally preferred for bare geomembranes, since no water is required to perform the test and it can be more sensitive than the water-based methods because the leak detection does not depend on water getting through the leak. The minimum sensitivity is a 1 mm diameter leak per ASTM D7953.

This type of test requires that the geomembrane is in contact with the subgrade. If the separation distance is greater than 3 cm, such as on a wrinkle or other "poor contact" conditions, the instrument is not likely to arc. The surface of the geomembrane must be clean and dry.

Applicable Standard

ASTM D7953 – 14 – Standard Practice for Electrical Leak Location on Exposed Geomembranes Using the Arc Testing Method.

Materials / Equipment

- Battery Power supply (800V – 35 000V)
- Current electrode (Negative grounding electrode)
- Electric cable (insulated)
- Arc testing wand (Positive electrode)
- Spray paint
- Handheld GPS

Calibration of Arc Testing Equipment

A test pad is to be constructed on site, replicating the layer works in the design, to the level of the exposed geomembrane layer to be tested. Punctures to the geomembrane are made at random locations and to varying sizes. The arc testing equipment is then set up and adjusted to successfully locate the punctures on the liner. Once all the punctures are located and adjustments made to the sensitivity of the arc tester, if any, the arc tester is calibrated.

Survey Methodology

The site will be visually inspected by the Electronic Leak Location (ELL) Technician to assess the site-specific conditions. A critical requirement for ELL testing methods is complete isolation of the survey area, and this will be checked and confirmed by the ELL Technician prior to the

commencement of testing. In addition to the site being isolated, the exposed geomembrane must be clean and dry as stated in the ASTM Standard D7953 for arc testing to commence.

No personal or equipment is allowed in the testing area during the testing process. The ELL technician will use the arc testing wand to sweep through the surface of the exposed geomembrane until the entire area requiring testing has been covered.

If a leak is detected, the ELL technician will mark and label the leak using spray paint, log the position using a handheld GPS and take a picture for record keeping. The ELL technician will then notify the relative site personal of the damages found in order for repairs to be done to the geomembrane liner.

General

- a) The lining contractor shall be available on site in the event that repairs are required.
- b) Repairs are to be carried out in accordance with Section 4.13.3 procedures.
- c) Testing of the repair seams shall be captured and documented.
- d) Complete isolation of the cell/dam being constructed, and any existing adjacent cells must be maintained.
- e) No site personal is allowed to handle any ELL testing equipment except the ELL technician.

PS 31 INDEPENDENT ELECTRIC LEAK LOCATION TESTING: DI-POLE TESTING

Scope

This specification is written in conjunction with ASTM D7007 and ASTM D6747 or ASTM D8265 for the proposed Electric Leak Location (ELL) testing of the HDPE geomembrane to be installed in the cell and leachate dam and contaminated water dam.

Description

The dipole method has a unique distinction in that it is the only ASTM standardized ELL practice that can locate damage to covered geomembranes after cover material placement.

The dipole geo-electric method according to ASTM D7007 uses the intrinsic insulation properties of geomembranes to localize perforations that enable water to pass from one side of the geomembrane to the other. This method enables leaks be identified and located by a specialized technician.

For surveys with earthen materials on the geomembrane, the earthen materials shall have adequate moisture to provide a continuous path for electrical current to flow through the leak.

A high voltage is applied to the cover material with a positive electrode. The power source is grounded to the subgrade underneath the geomembrane. Voltage measurements are taken in a grid pattern throughout the survey area using a dipole instrument. Leak locations cause a sine wave pattern in the voltage measurements as the dipole instrument travels across a hole location.

Materials / Equipment

- Calibrated excitation power supply
- Current electrodes (positive and negative)
- Electric Cable (insulated)
- Dipole Tester (with measurement electrodes)
- Calibrated Data Logger (measuring device)
- Water Tanker (with hose and fittings)
- Power Supply (Generator)
- Handheld GPS
- Mapping Software

Site / Design Requirements

- a) The maximum cover, over the geomembrane to be tested, should not exceed 600mm thick and the cover material to be as homogenous as possible (to be included in material specification).
- b) The wrinkle sizes on the geomembrane should be reduced as far as possible and the specification should cater for the placement of the cover material to reduce the wrinkles. It is almost impossible to detect damages without intermit contact between the geomembrane and the conductive layer below.
- c) **Most Critical** – The survey area must be electrically isolated, no exceptions.
- d) Anchorage of the geomembrane - **The loose end of the geomembrane to exit the anchor trench and form a flap after the trench has been backfilled.** This is the best way to ensure complete isolation of the area to be tested.
- e) Drainage material or any material covering the geomembrane to only be filled on the inner side of the anchor trench (no contact with in-situ soil).
- f) No access ramps or internal berms to be constructed over the perimeter of the cell unless they are isolated by means of trenches or other isolation methods. Ideally any fill earthworks structures that continue outside the lined area of the cell should only be completed after the ELL survey. No fill over the geomembrane shall exceed 600mm before the test has been concluded.
- g) The protection geotextile over the geomembrane must be kept within the confined isolated area. Wet geotextiles become conductive so this must be considered during placement.
- h) The CCL / GCL moisture content should be a minimum of 10% to ensure conductivity. This should be carefully specified for double composite systems.
- i) If the CCL / GCL has been exposed for an extended period of time it should be hydrated prior to covering.
- j) The in-situ soil conductivity and moisture content should be tested by an accredited laboratory. The results obtained from the ELL survey depends on the in-situ site conditions.
- k) In climates were high rainfall or extreme rain events are expected, a rain flap on the geomembrane should be considered to prevent overflow of the runoff and hence maintain isolation.
- l) Conductive paths such as metal pipes penetrations, pump grounds and batten strips on concrete should be isolated or insulated from the earthen material on the geomembrane whenever practical.
- m) If the leak detection layer is not a gravel, but a geocomposite material then keep in mind that a lot more water will be required as it will need to be saturated before commencing the test.
- n) For the primary geomembrane:
 - i. Material under the primary geomembrane must be conductive (if it is a CCL / GCL it must have sufficient moisture).
 - ii. The conductive layer under the geomembrane must be accessible for an earth (negative electrode).
 - iii. The covering layer on the primary geomembrane, again, must be properly isolated from the underlying layer.

General

- a) The lining contractor shall be available on site in the event that repairs are required.
- b) Complete isolation between the cell being constructed and exiting adjacent cells must be maintained.

- c) A water tanker must be available on site during each day of the ELL survey. If possible the tanker should be stationed inside the lined area of the cell to be tested. If not possible any connections from the water tank (hose pipes etc.) must be isolated (i.e. there should be no leaks in the hose and the hose material should be non-conductive).
- d) The programme and planning for the installation of the lining system must allow for the ELL survey to be conducted on the Secondary and Primary geomembranes.

CAPE WINELANDS DISTRICT MUNICIPALITY

CONTRACT NO. T 2023/022

CONSTRUCTION OF A CLASS B LANDFILL FOR WORCESTER, CWDM

C3.4 Management

C3.4.1 FORMS FOR CONTRACT ADMINISTRATION

The Contractor shall prepare, and submit with each monthly statement for payment, the following updated returns (the format of which are attached in C3.6 Annexes):

- Project Labour Report (Annex 1)

The Project Labour Report must include details of all labour (including that of sub-contractors) that earns less than R200 per day (excluding any benefits) employed from within the target area on this contract in the month in question.

C3.4.2 PARTICIPATION OF TARGETED LABOUR

C3.4.2.1 Minimum targeted labour contract participation goal

In support of the National Department of Public Works' Expanded Public Works Programme which is aimed at the alleviation of poverty through the creation of employment opportunities, the Employer is seeking to increase the intensity of labour, as appropriate, in all of its infrastructure sector projects.

It is a requirement of this contract, therefore, that the work be executed in such a manner so as to maximise the use of labour intensive construction methods in order to provide low and semi-skilled employment opportunities.

To this end, a minimum targeted labour contract participation goal is specified below, which shall be achieved by the Contractor in the performance of the contract, failing which, penalties as described will be applied.

The specified minimum targeted labour contract participation goal (CPGL) is

5 %

The minimum CPGL is such that the Contractor will have to carry out some of the work that would normally have been undertaken using mechanised construction methods, by using labour intensive construction methods instead. It is left to the discretion of the Contractor to identify suitable work activities for the intensification of labour. The Contractor shall, within 5 working days of being requested in writing by the Engineer to do so, submit details of his/her plan to achieve the minimum CPGL.

C3.4.2.2 Definitions

For the purposes of the requirements in respect of the participation of targeted labour, the following definitions shall apply:

“**Target area**” means the geographical area shown on plan in Part C5: Site Information

“**Targeted labour contract participation goal (CPGL)**” means the sum of the wages (excluding any benefits), for which the Contractor, or any of his/her sub-contractors contracts targeted labour in the performance of the contract, expressed as a percentage of the value of the contract.

“**Targeted labour**” means low and semi-skilled individuals, whose wages (excluding any benefits) do not exceed the threshold value, who reside in the target area, that are employed by the Contractor, or any of his/her sub-contractors, in the performance of the contract.

“**Threshold value**” is R200.00 per day. The threshold value is not to be confused with any industry sector minimum wage determined in accordance with the Basic Conditions of Employment Act, No. 75 of 1977.

“**Value of the contract**” means the contract sum (accepted contract amount) less provisional sums, contingencies and VAT.

C3.4.2.3 The selection and recruitment of targeted labour

Where targeted labour is to be drawn from specific local communities (defined in terms of the target area), such labour shall be identified using the relevant Sub-Council Job-Seekers Database. The Contractor shall request a list of suitable candidates from the database, from which the Contractor shall make his/her final selection. The contractor shall enter into written contracts of temporary employment with all targeted labour.

Any difficulty experienced by the Contractor in identifying candidates through the Job-Seekers Database, or as regards any matter relating to the employment of targeted labour, shall be immediately referred to the Engineer.

C3.4.2.4 Contract participation goal credits

Credits towards the achieving the minimum CPG_L shall be granted by converting the total monetary value of wages paid to targeted labour to a percentage of the value of the contract. No credits shall be accorded should the contractor fail to enter into written contracts with the targeted labour. Furthermore, no credits shall be accorded in respect of targeted labour employed on work in respect of provisional sums or prime cost items. Such labour shall nevertheless be recorded on the Project Labour Report which is required to be furnished by the Contractor.

In addition to the forms required for contract administration (the Project Labour Report and Targeted Labour Contract Participation Expenditure Report, in particular), the Contractor shall furnish the Engineer with copies of the employment contracts entered into with targeted labour, as well as evidence of payments to the such labour in the form of copies of payslips or payroll runs.

C3.4.2.5 Training of targeted labour

The Contractor is required to provide all informal (on-the-job) skills training so as to ensure that a minimum level of competence is achieved and maintained, such that the various activities are carried out safely and to the required standard. The cost of informal training shall be included in the rates for the various work activities.

C3.4.2.6 Penalties

The financial penalty to be applied for failing to meet the specified minimum targeted labour contract participation goal in the performance of the contract (unless proven to be beyond the control of the Contractor), is as follows:

$$\text{Penalty} = (\text{CPG}_L^S - \text{CPG}_L^A) \times P^*$$

Where CPG_L^S = the specified minimum targeted labour contract participation goal (expressed as a percentage).

CPG_L^A = the targeted labour contract participation goal achieved (expressed as a percentage).

P^* = the value of the contract.

C3.4.2.6 Supporting Documentation

As local labourers need to be employed, EPWP principles will be applicable on this project with respect to EPWP compliance; the contractor needs to adhere to the following points:

- Please adhere to PPE as per safety plan, make provision for the expense on PPE
- COIDA and UIF registering of labourers
- Contractor should have contracts with workers. (concept will be provided)

- Attendance registers to be signed by each labourer. (concept register will be provided)
- Certified Copy of ID's as well as household information needed.
- Type of payslip for payments made to labourers and signed by them.

The above evidence for each labourer needs to be submitted at the end of the contract in a file to Cape Winelands District Municipality's representative. The above points need to be taken seriously as it will be audited by National Department of Public Works for compliance.

C3.4.3 PARTICIPATION OF TARGETED ENTERPRISE/S

C3.4.3.1 Requirements for development

The Contractor shall provide a competent person/s to provide internal mentorship to the Targeted Enterprise/s in the two agreed developmental areas, as laid out in the **Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts**, as published in **Gazette Notice No. 36190** of 25 February 2013

C3.4.3.2 Format of Communications

The Contractor shall submit to the Employer's Representative:

- Project interim reports, in the specified format (form ED105P) detailing interim value of the CPG that was achieved. Such report shall include a monthly progress report, compiled by the Employer's Representative and the Contractor, detailing an assessment of the enterprise development support provided.
- Project completion report, in the specified format (form ED101P), to the Employer's Representative for acceptance within 15 days of achieving practical completion. The report shall include the value of the CPG that was certified in accordance with the contract, cidb registration numbers of each and every targeted enterprise and the value of the sub-contracted works or the participation parameter of the joint value entered into; and
- Enterprise development declaration (form ED104P).

C3.4.3.3 Key Personnel

The Contractor shall appoint an Enterprise Development Co-ordinator who shall have the following competencies:

- Minimum experience of 5 years in the construction industry as a Site Agent, Contracts Manager, Site Manager, Construction Manager, Business Development Manager or Enterprise Development Manager;
- Minimum of 2 years in training and development in building / construction; and
- National Diploma or B Degree in the Built Environment or Business Management.

C3.4.3.4 Management Meetings

The Contractor shall report to the Employer's Representative on the implementation of the targeted enterprise development and CPG.

C3.4.3.5 Records

The Contractor shall keep records of the targeted enterprise development and of payments made to the targeted enterprise/s in relation to the CPG, and shall ensure all documentation is provided as per the Standard.

C3.4.3.6 Payment Certificates

The Contractor shall submit payment certificates to the Employer's Representative at intervals determined in the contract.

ANNEX 1

CAPE WINELANDS DISTRICT MUNICIPALITY Project Labour Report

Project/Contract Name:						Budget: (tick one) Capital <input checked="" type="checkbox"/> Operating <input type="checkbox"/>				
Project/Contract Number:						WBS No./Cost Centre No				
Contractor:						Project/Contract Start Date:				
Consultant:						Project/Contract End Date:				
CLO Name:			CLO ID Number:			Project/Contract Value (incl. allowance for escalation/excl. VAT):				
Month:						Project Labour Intensity Target/ Specified Minimum Targeted Labour Contract Participation Goal:				
Total value of work done to date (incl. escalation/excl. VAT):										
Number of workers	Name	Surname	ID Number/DOB	Targeted Labour (Y/N)	Daily Rate	Number of days worked this month (incl. training)	Disabled (Y/N)	Number of training days this month	Course Name	Training Service Provider
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
Totals for sheet										
Sheet of										

Signatures

Contractor: _____ Date: _____

Consultant/Project Manager: _____ Date: _____

Part C4: Site information

C4 Site information.....217



Worcester Landfill Site

T 2023/022 : Locality Plan