

TENDER NO. T13/2025	 LANGEBERG MUNISIPALITEIT MUNICIPALITY MASIPALA	
Approved by Supply Chain Manager	Version: 00	Page 1 of 301 (incl. BOQ Pages)

CONTRACT DOCUMENT

FOR THE

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

VOLUME 1: RETURNABLE DOCUMENT

NOTE:

- The Form of Offer and Acceptance (C1.1) is on **page 89** of this document
- Table 1: Preference Schedule (B-BBEE contribution & Locality) is on **page 81** of this document

MAY 2025

Name of Tenderer	
Address (Physical)	
Contact Person	
Contact Number	
Email Address	
Amount (Contingencies and 15% VAT Included)	
B-BBEE Status	
Duration (weeks)	

ISSUED BY:

 LANGEBERG MUNISIPALITEIT MUNICIPALITY MASIPALA THE MUNICIPAL MANAGER LANGEBERG MUNICIPALITY 28 MAIN ROAD ASHTON 6715 TEL: (023) 615 8000	 INVICTUS Engineering Services MODENA BUILDING BELLA ROSA VILLAGE CNR OF BELLA ROSA AND DURBANVILLE AVE BELLVILLE 7530 TEL: (021) 975 1718
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TENDER T13/2025

Tenders are hereby requested for the **BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON**, as specified in the bid document. Completed Bids, in sealed envelopes, clearly marked **TENDER T13/2025 BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON**, should be placed in the tender box, at the Langeberg Municipal Office, 28 Main Road, Ashton, not later than **12:00 on 27 June 2025** when the Bids will be opened in public. Late, faxed or e-mailed tenders will not be considered.

Tenderers must be registered with the CIDB in a class of construction works and have a grading designation equal to or higher than that determined in accordance with the sum tendered or a value determined in accordance with regulation 25 (7A) of the Construction Industry Development Regulations, 2004. It is estimated that tenderers will need a grading designation of 6CE OR HIGHER.

COMPULSORY CLARIFICATION MEETING:

A COMPULSORY CLARIFICATION MEETING WILL BE HELD ON THE 04 JUNE 2025 AT - 10H00, AT THE MUNICIPAL LIBRARY, 23 FAURE STREET, ASHTON. NO LATE COMERS WILL BE ADMITTED AFTER 10H05.

PLEASE NOTE:

The official Bid document must be fully completed in black ink, all pages must be returned and the document should preferably be stapled or bound. Supporting documents must be submitted separately and must be stapled or bound.

The lowest, or any tender, will not necessarily be accepted and council reserves the right to accept any tender. Tenders will be evaluated according to the Council's Supply Chain Management Policy and the 80/20 Preference Point system. The Supply Chain Management Policy can be viewed at Municipal Offices or www.langeberg.gov.za

A minimum functional assessment score of 70 points will apply to this contract

Bid documents are available from **23 MAY 2025**, on the Langeberg Municipal website: www.langeberg.gov.za
Please refer written enquiries to MR C POSTHUMUS (cposthumus@langeberg.gov.za).

DP LUBBE

MUNICIPAL MANAGER

Private Bag X2,

Ashton, 6715

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

General Tender Information

TENDER ADVERTISED :	23 May 2025
ESTIMATED CIDB CONTRACTOR GRADING DESIGNATION :	6CE or higher
SITE VISIT/CLARIFICATION MEETING :	04 June 2025 at 10h00
VENUE FOR SITE VISIT/ COMPULSORY CLARIFICATION MEETING :	Municipal Offices, 28 Main Road, Ashton
CLOSING DATE :	27 June 2025
CLOSING TIME :	12h00
TENDER BOX & ADDRESS :	The Bid Box, at the Entrance of Municipal Office, 28 Main Road, Ashton, LANGEBERG Municipality.

: The Tender Document (which includes the Form of Offer and Acceptance) completed in all respects, plus any additional supporting documents 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 at 12h00.

If the tender offer is too large to fit into the abovementioned box or the box is full, please enquire at the reception 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.

TENDERERS MUST NOTE THAT WHEREVER THIS DOCUMENT REFERS TO ANY PARTICULAR TRADEMARK, NAME, PATENT, DESIGN, TYPE, SPECIFIC ORIGIN OR PRODUCER, SUCH REFERENCE SHALL BE DEEMED TO BE ACCOMPANIED BY THE WORDS "OR EQUIVALENT"

**PART A (MBD1)
INVITATION TO BID**

THE FOLLOWING PARTICULARS MUST BE FURNISHED
(FAILURE TO DO SO WILL RESULT IN YOUR OFFER BEING DISQUALIFIED)

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE LANGEBERG MUNICIPALITY					
BID NUMBER:	T13/2025	CLOSING DATE:	27 June 2025	CLOSING TIME:	12h00
DESCRIPTION:	BREEDE RIVER RAW WATER PUMPSTATION, ASHTON				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM.					

BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT:
ENTRANCE OF THE MUNICIPAL OFFICES 28 Main Road Ashton 6715

SUPPLIER INFORMATION			
NAME OF BIDDER			
POSTAL ADDRESS			
STREET ADDRESS			
TELEPHONE CODE & NUMBER			
CELL PHONE NUMBER			
FACSIMILE CODE & NUMBER			
E-MAIL ADDRESS			
VAT REGISTRATION NUMBER			
TAX PIN		TAX REFERENCE NUMBER	
CSD No			
ORIGINAL AND VALID TAX CLEARANCE CERTIFICATE / TSC PIN SUBMITTED? YES ☐ NO ☐			
A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BEE. NOTE A CERTIFIED COPY OR ORIGINAL IS COMPULSORY			
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE SUBMITTED? (MBD 6.1) YES ☐ NO ☐			
IF YES, WHO WAS THE CERTIFICATE ISSUED BY? (Tick applicable box)			
A VERIFICATION AGENCY ACCREDITED BY SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM (SANAS) ☐			
or			
A SWORN AFFIDAVIT FOR EME'S AND QSE'S ☐			
RECENT MUNICIPAL ACCOUNT OF COMPANY (NOT OLDER THAN 90 DAYS) MUST BE ATTACHED			
RECENT MUNICIPAL ACCOUNTS OF ALL THE DIRECTORS/ SHAREHOLDERS MUST BE ATTACHED			
IF LEASING/RENTING/LODGING – ATTACHED LATEST VALID COPY OF AGREEMENT IF NO PROPERTY REGISTERED IN YOUR NAME SUBMIT AN AFFIDAVIT CONFIRMING THIS.			

BID PRICE OFFERED NB: NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE (see definition on MBD 4 attached)	
TOTAL BID PRICE (INCL Contingencies & 15% VAT)	

ANY ENQUIRIES REGARDING THE BIDDING PROCEDURE MAY BE DIRECTED TO:

LANGEBERG MUNICIPALITY

Contact Person: Mr C. Posthumus

Tel: 023 626 8200

Fax: 023 615 1563

E-mail: cposthumus@langeberg.gov.za

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

YOURS FAITHFULLY,

DP LUBBE
MUNICIPAL MANAGER
MUNICIPAL OFFICES
PRIVATE BAG X2
ASHTON
6715

TEL: 023 626 8200

PART B (MBD 1)
TERMS AND CONDITIONS FOR BIDDING

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 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 TAXPAYERS 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 PARAGRAPH 3 BELOW
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)? ☐ YES ☐ NO
3.2	DOES THE ENTITY HAVE A BRANCH IN THE RSA? ☐ YES ☐ NO
3.3	DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA? ☐ YES ☐ NO
3.4	DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA? ☐ YES ☐ NO
3.5	IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION? ☐ YES ☐ 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

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

CHECK LIST

This list is to assist all bidders to submit complete proposals. Bidders are to check the following points before the submission of their proposals:		
1	All pages of the document have been read by the contractor and initialled.	☐
2	Any discrepancy and/or misunderstanding is cleared with the relevant officials.	☐
3	All pages requiring information have been <u>completed in black ink.</u>	☐
4	The Schedule of Quantities has been checked for arithmetic correctness.	☐
5	Totals from each sub section of the Schedule of Quantities have been carried forward to the summary page and done so correctly.	☐
6	The total from the summary page has been carried forward to the Form of Offer.	☐
7	Surety details where applicable have been included in the proposal.	☐
8	All sections requiring information have been completed.	☐
9	Bidder ensured that all documents is properly completed and signed	☐
10	The contractor has complied with the proposal prerequisites.	☐
11	The document is submitted before 12h00 on the due date at the designated bid box of Langeberg Municipality.	☐

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

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LANGEBERG MUNICIPALITY

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Part T1 Tendering procedures

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LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

T1.1 Tender Notice and Invitation to Tender

LANGEBERG MUNICIPALITY | UMASIPALA | MUNISIPALITEIT

Private Bag X2, Ashton, 6715

☎ (023) 615 8000 📠 (023) 615 1563 @ cposthumus@langeberg.gov.za

🌐 www.langeberg.gov.za



TENDER NOTICE AND INVITATION TO BID			
DEPARTMENT INFRASTRUCTURE			
ADVERTISED IN	MUNICIPAL NOTICE BOARD, MUNICIPAL WEBSITE, DIE BURGER		
BID NO:	T13/2025	PUBLISHED DATE:	23 May 2025
Bids are hereby invited for (Tender Description)	BREEDE RIVER RAW WATER PUMPSTATION, ASHTON		
Closing Time and Date	No later than 12H00	On the Date	27 June 2025
Compulsory Site Meeting	04 June 2025 @ 10h00		CIDB GRADING: 6CE or higher
Bids will be opened immediately thereafter, in public at the Council Chambers of LANGEBERG Municipality, 28 Main Road, Ashton.			
AVAILABILITY OF BID DOCUMENTS			
Tender Documents will be downloadable only form www.langeberg.gov.za			
Date Available	23 May 2025		
BID RULES			
a. Bids are to be completed in accordance with the conditions and bid rules contained in the bid document and supporting documents must be placed in a sealed envelope and externally endorsed WITH THE NAME AND ADDRESS OF THE TENDERER, THE TENDER NO. AND TITLE AND THE CLOSING DATE, and be deposited in the Bid Box, at the Supply Chain Management Unit, Langeberg Municipality, 28 Main Street, Ashton. b. Bids may only be submitted on the bid documentation issued by the Municipality. c. The Langeberg Municipality does not bind itself to accept the lowest or any tender and reserves the right to accept any tender, as it may deem expedient. Tenders will be evaluated according to the Council's Supply Chain Management Policy and the 80/20 Preference Point system. The Supply Chain Management Policy can be viewed at Municipal Offices or www.langeberg.gov.za d. Tenderers who are not yet registered are required to register on the Municipality's Accredited Supplier Database (CSD). Online registration to be completed on the CSD registration platform, website https://secure.csd.gov.za. e. Pre-qualification criteria for preferential procurement is applicable to the tender.			
Tenders shall be evaluated in terms of the latest Langeberg Municipality Supply Chain Management Policy and the Preferential Procurement Regulations.		Bidders may claim preference points in terms of their B-BBEE status level of contribution and locality.	
Preferential Procurement Point System Applicable	80/20	Local Content Requirement	N/A
Compulsory site Meeting/ Information Session	Yes	Validity Period	120 days
TECHNICAL ENQUIRIES: Mr C Posthumus cposthumus@langeberg.gov.za		BIDDING PROCEDURE REQUIREMENTS & ENQUIRIES: Mr C Posthumus cposthumus@langeberg.gov.za	
Section	ENGINEERING SERVICES	Section	SUPPLY CHAIN MANAGEMENT
Contact Person	Mr C Posthumus	Contact Person	Mr S Ngcongolo -
Tel:	E-mail Enquiries Only	Tel:	E-mail Enquiries Only
E-mail	cposthumus@langeberg.gov.za	E-mail	SNgcongolo@langeberg.gov.za

Authorised by:

DP LUBBE

Private Bag X2

MUNICIPAL MANAGER

ASHTON, 6715

NOTICE NR: T13/2025

TEL: 023 626 8000

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

T1.2 Tender Data

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of Government Gazette No. 42622 of 8 August 2019, Construction Industry Development Board (CIDB) Standard for Uniformity in Construction Procurement. (see www.cidb.org.za) which are reproduced without amendment or alteration for the convenience of tenderers as an Annex to this Tender Data.

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
---------------	-------------

C.1	General
------------	----------------

C.1.1	Actions
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C.1.1.1	<i>Add the following:</i>
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The parties agree that this tender, its evaluation and acceptance and any resulting contract shall also be subject to the Employer's Supply Chain Management Policy ('SCM Policy') that was applicable on the date the tender was advertised, save that if the Employer adopts a new SCM Policy which contemplates that any clause therein would apply to the contract emanating from this tender, such clause shall also be applicable to that contract. Please refer to this document contained on the Employer's website.

Abuse of the supply chain management system is not permitted and may result in the tender being rejected, cancellation of the contract, restriction of the supplier, and/or the exercise by the Employer of any other rights and remedies available to it as described in the SCM Policy.

The Employer is the LANGEBERG MUNICIPALITY, represented Mr C Posthumus
28 Main Road, ASHTON, 6715.

C.1.2	Tender Documents <i>Add the following:</i>
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The following documents form part of this contract:

VOLUME 1: The Tender Document issued by the employer (this document), in which is bound:

THE TENDER

Part T1: Tendering Procedure

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: Agreement and contract data

- C1.1 Form of Offer and Acceptance
- C1.2 Contract Data (data provided by the Contractor) – Part 1
- C1.2 Contract Data (data provided by the Employer) – Part 2
- C1.3 Form of Performance Guarantee
- C1.4 Form of Advance Payment Guarantee
- C1.5 Occupational Health and Safety Agreement
- C1.6 Protection of the Environment Declaration
- C1.7 Insurance Broker's Warranty

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/Design
- C3.3 Procurement
- C3.4 Construction

Part C4: Site information

- C4 Site information

Part C5: LANGEBERG Municipality Supply Chain Policy

- C5 Supply Chain Policy

Part C6: Health and Safety Specifications

- C6 Health and Safety Tender Specifications

Part C7: Drawings

- C7 Drawings

Volume 1 is deemed the "Returnable Document" which must be returned to the Employer in terms of submitting a tender offer.

In addition to the above, the following further documents are part of the tender:

VOLUME 2: The General Conditions of Contract for Construction Works, Third Edition, 2015, prepared by the South African Institution of Civil Engineering (SAICE). 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 3: 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.

VOLUME 4: *Model Preambles for Trades (2008 Edition)*. This document is published by and is

Volumes 2, 3 & 4 may also be inspected, by appointment, at the offices of the Employer's Agent during normal office hours.

C.1.4 Communication and employer's agent

Delete the first sentence of the clause and replace with the following:

Verbal or any other form of communication, from the Employer, its employees, agents or advisors 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, unless communicated by the Employer in writing to suppliers by its Municipal Supply Chain Manager or his nominee.

The Employer's Agent is:

Company: Invictus Engineering Services (Pty) Ltd

Name: Francois Ryke (PrEng)

Address: 5th Floor Modena Building, Bella Rosa Village, c/o Durban Road and Bella Rosa Street, BELLVILLE, 7530

Tel: (021) 975 1718 Cell: 082 372 8644

E-mail: francoisr@invictuseng.co.za

C.1.5 Cancellation and Re-Invitation of Tenders

Remove C.1.5.1, C.1.5.2 & C.1.5.3 and replace with the following:

C.1.5.4.1 In the event that, in the application of the 80/20 preference point system as stipulated in the tender documents, all tenders received exceed the estimated Rand value of R50 000 000, the tender invitation must be cancelled.

C.1.5.4.2 In the event that, in the application of the 90/10 preference point system as stipulated in the tender documents, all tenders received are equal to, or below R50 000 000 the tender must be cancelled.

C.1.5.4.3 An organ of state which has cancelled a tender invitation as contemplated in sub-regulations (1) and (2) must re-invite tenders and must, in the tender documents stipulate the preference point system to be applied.

C.1.5.4.4 An organ of state may, prior to the award of a tender, cancel a tender if -

a) due to changed circumstances, there is no longer need for the goods or services tendered for; or

b) funds are no longer available to cover the total envisaged expenditure; or

c) no acceptable tenders are received.

C.1.6.2 Competitive negotiation procedure

Add the following between C.1.6.2 and C.1.6.2.1:

A competitive negotiation procedure will **not** be followed.

C.1.6.3 Proposal procedure using the two-stage system

Add the following between C.1.6.3 and C.1.6.3.1:

A two-stage system will **not** be followed.

Add the following Clauses (C.1.6.4, C1.7) after Clause C.1.6.3 and before clause C.2.

C.1.6.4 Objections, complaints, queries and disputes/ Appeals in terms of Section 62 of the Systems Act/ Access to court

- C.1.6.4.1 Disputes, objections, complaints, and queries
In terms of Regulations 49 and 50 of the Local Government: Municipal Finance Management Act, 56 of 2003 – Municipal Supply Chain Management Regulations (Board Notice 868 of 2005):
a) Persons aggrieved by decisions or actions taken by the **Langeberg 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.
- C.1.6.4.2 Appeals
a) In terms of Section 62 of the Local Government: Municipal Systems Act, 32 of 2000 a person whose rights are affected by a decision taken by the **Langeberg Municipality**, 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) Must be in writing
ii) It must set out the reasons for the appeal
iii) It must state in which way the Appellant's rights were affected by the decision;
iv) It must state the remedy sought; and
v) It must be accompanied with a copy of the notification advising the person of the decision
c) The relevant **Langeberg Municipality** appeal authority must consider the appeal and **may confirm, vary or revoke** the decision that has been appealed, but no such revocation of a decision may detract from any rights that may have accrued as a result of the decision.
- C.1.6.4.3 Right to approach the courts and rights in terms of **Promotion of Administrative Justice Act, 3 of 2000** and **Promotion of Access to Information Act, 2 of 2000**
The sub-clauses above 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.
- C.1.6.4.4 All requests referring to sub clauses C.1.6.4.1; C.1.6.4.2 and C.1.6.4.3 must be submitted in writing to:
The Municipal Manager - Langeberg Municipal Offices
Via hand delivery at: Langeberg Municipality, 28 Main Street, Ashton
Via post at: Private Bag X2, Ashton, 6715
Via fax at: (023) 615 1563
Via email at: mm@langeberg.gov.za
- C.1.7 National Treasury Web Based Central Supplier Database (CSD) Registration
Tenderers are required to be registered on the National Treasury Web Based Central Supplier Database (CSD) as a service provider. Tenderers must register as such upon being requested to do so in writing and within the period contained in such a request, failing which no orders can be raised or payments processed from the resulting contract. In the case of Joint Venture partnerships this requirement will apply individually to each party of the Joint Venture.
- Tenderers who wish to register on the National Treasury Web Based Central Supplier Database (CSD) may do so via the web address **<https://secure.csd.gov.za>**.
- It is each tenderer's responsibility to keep all the information on the National Treasury Web Based Central Supplier Database (CSD) updated.
- C.2 Tenderer's obligations**
- C.2.1.1 *Delete the content of this clause and replace with the following:*
Tenderers must submit a tender offer that complies in all aspects to the conditions as detailed in this document. Only those tenders that comply in all aspects with the tender conditions, specifications, pricing instructions and contract conditions will be declared responsive.

Add the following clauses after C.2.1.2 and before C2.2:

C.2.1.3 Only those tender submissions from which it can be established that a clear and unambiguous offer has been made to Employer, by whom the offer has been made and what the offer constitutes, will be declared responsive.

C.2.1.4 Only those tenders that satisfy the following criteria will be declared responsive:

C.2.1.4.1 Construction Industry Development Board (CIDB) Registration

Only those tenderers who are registered with the CIDB, or capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations, for a CE or GB class of construction work, are eligible to have their tenders evaluated. Tenderers must obtain such active status upon being requested to do so in writing and within the period contained in such a request, failing which their tenders will be declared non-responsive.

Joint Ventures are eligible to submit tenders provided that:

- a) every member of the joint venture is registered with an active status with the CIDB;
- b) **the lead partner has a contractor grading designation of not lower than one level below the required grading designation in the 6CE or higher class of construction work; and**
- c) **the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a CE class of construction work or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations.**

Contractor grading designations and associated parameters as follows:

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

For more details on classes of construction work refer to the CIDB website.

C.2.1.4.2 Compliance with requirements of LANGEBERG MUNICIPALITY SCM Policy and procedures

Only those tenders that are compliant with the requirements below will be declared responsive:

- a) A completed **Compulsory Enterprise Questionnaire** to be provided (applicable schedule to be completed);
- b) A completed **Certificate of Authority for Companies/Partnerships/Joint Ventures/Consortiums** to be provided authorising the tender to be made and the signatory to sign the tender on the partnership /joint venture/consortium's behalf (applicable schedule to be completed);
- c) A copy of the partnership / joint venture / consortium agreement to be provided;
- d) A completed **Declaration of Interest – State Employees** to be provided and which does not indicate any non-compliance with the legal requirements relating to state employees (applicable schedule to be completed);
- e) A completed **Declaration – Conflict of Interest and Declaration of Bidder's past Supply Chain Management Practices** to be provided and which does not indicate any conflict or past practises that renders the tender non-responsive based on the conditions contained

- thereon (applicable schedules to be completed);
- f) A completed **Certificate of Independent Bid Determination** to be provided and which does not indicate any non-compliance with the requirements of the schedule (applicable schedule to be completed);
 - g) The tenderer (including any of its directors or members), has not been restricted in terms of abuse of the Supply Chain Management Policy;
 - h) The tenderer's tax matters with SARS are in order, or the tenderer is a foreign supplier that is not required to be registered for tax compliance with SARS;
 - i) The tenderer is not an advisor or consultant contracted with the Employer whose prior or current obligations creates any conflict of interest or unfair advantage;
 - j) The tenderer is not a person, advisor, corporate entity or a director of such corporate entity, involved with the bid specification committee;
 - k) A completed Authorisation for the Deduction of Outstanding Amounts Owed to the Langeberg Municipality to be provided and which does not indicate any details that renders the tender non-responsive based on the conditions contained thereon (applicable schedules to be completed);
 - l) The tenderer (including any of its directors or members), has not been found guilty of contravening the Competition Act 89 of 1998, as amended from time to time;
 - m) The tenderer (including any of its directors or members), has not been found guilty on any other basis listed in the SCM Policy.

C.2.1.4.3 Minimum score for functionality based on a pre-qualification inspection

Please note that points scored for Quality (functionality) will not have an influence on the total tender evaluation points and will therefore not affect the ranking of the tenderers, it will only be regarded as a pre-qualification. The minimum points required to be eligible to tender is 70 out of a 100.

THE CRITERIA to be applied in evaluating the proposal is set out in the table below:

Calculate the points for functionality according to the following formula:

$$P_s = S_o / M_s \times A_p$$

Where P_s = Percentage scored for functionality by bid under consideration
 S_o = Total score of bid/proposal under consideration
 M_s = Maximum possible score = 500
 A_p = percentage allocated for functionality = 100

Total points by bidder on functionality:

- i) $P_{s(\text{Criterion 1})} = (\text{Indicator allocated/scored out of 5}) \times \text{weight}$
 - ii) $P_{s(\text{Criterion 2})} = (\text{Indicator allocated/scored out of 5}) \times \text{weight}$
- $$P_{s(\text{TOTAL})} = [(P_{s(\text{Criterion 1})} + P_{s(\text{Criterion 2})}) / 5] \times 100$$

Criteria can be amended to suit project complexity or omitted if not applicable.

Projects of a similar scope and nature is regarded as:

Building of pumpstations for municipal water or sewer bulk infrastructure, installation of pipes by trench excavations, bedding, backfilling and compaction of various materials, construction of various brick, mortar and concrete structures for water and reticulation purposes, i.e.: valve chambers, thrust blocks, manholes, etc. to a value >R5m.

Criterion	Weight
1) Relevant Experience (Returnable Schedule 14)	50%
2) Construction Manager Experience (Returnable Schedule 15)	50%
Total	100%

EVALUATION CRITERION 1

Tenderers must have successfully **completed** (please note that current projects will not be included in the evaluation) at least 5 projects of a similar scope and nature in the last 10 years to score full marks on this criterion. Refer to the table below for a measurement of how points will be awarded against this criterion.

A detailed list of successfully completed projects must be completed in/attached to **Schedule 14**.

1. RELEVANT EXPERIENCE	
INDICATOR	Evaluation Criteria for Relevant Experience: (number of similar projects completed by the contractor in the last 10 years)
0	The tenderer has completed zero projects in the last 10 years
1	The tenderer has completed only 1 project in the last 10 years
2	The tenderer has completed exactly 2 projects in the last 10 years
3	The tenderer has completed exactly 3 projects in the last 10 years
4	The tenderer has completed exactly 4 projects in the last 10 years
5	The tenderer has completed 5 or more projects in the last 10 years

EVALUATION CRITERION 2

Detailed, project specific CV's to be included in **Schedule 15** of the Returnable Documents. Failure to do so during tender phase will lead to disqualification of tenderer.

Construction Managers must have successfully **completed** (please note that current projects will not be included in the evaluation) at least 3 projects of a similar scope and nature in the last 10 years to score full marks on this criterion. Refer to the table below for a measurement of how points will be awarded against this criterion.

Please note that no tenderer will be contacted to clarify any experience or construction equipment, or plant submitted with this bid. If insufficient information is shown, the tenderer will **not** be contacted for clarification.

If, during construction, the contractor wishes to replace the construction manager, the contractor will apply in writing to the Engineer as per clause 4.12 of the GCC 2015. Only similarly experienced and competent Construction Managers will be considered.

2. CONSTRUCTION MANAGER	
INDICATOR	Evaluation Criteria for Construction manager: (number of similar projects completed by the Construction manager in the last 10 years)
0	The Construction manager has completed zero projects in the last 10 years
1	The Construction manager has completed only 1 project in the last 10 years
3	The Construction manager has completed exactly 2 projects in the last 10 years
5	The Construction manager has completed exactly 3 or more projects in the last 10 years

The functionality proposal will be evaluated individually on score sheets, by a representative evaluation panel according to the evaluation criteria indicated above. All service providers who scored less than 70 out of 100 points for functionality will not be considered further. At least 3 evaluators will evaluate the quality schedules separately.

NB: Points scored for Quality (functionality) will not have an influence on the total tender evaluation points.

Where the entity tendering is a Joint Venture the tender must be accompanied by a statement

describing exactly what aspects of the work will be undertaken by each party to the joint venture (appended to Schedule 3, Part T2.2: Returnable Schedules).

C.2.1.4.4.3 A copy of the authorisation letter must be submitted together with the bid document at the closing date and time of the bid.

C.2.1.4.5 Compulsory clarification meeting
Tenderers are required to attend a compulsory clarification meeting at which they may familiarise themselves with aspects of the proposed work, services or supply and pose questions. Details of the meeting(s) are stated in the General Tender Information. Only those tenders submitted by tenderers whose attendance at this meeting have been recorded, will be declared responsive.

C.2.1.4.6 Good standing with Bargaining Council
Only those tenders submitted by tenderers who are in good standing with the **Bargaining Council for the Civil Engineering Industry (BCCEI)** at the time of the tender award will be declared responsive. Tenderers must attach such proof to the schedule titled **Declaration in Respect of Compliance with Labour Legislation** or obtain such upon being requested to do so in writing and within the period contained in such a request, failing which their tenders will be declared non-responsive.

C.2.1.4.7 Good standing with SARS/Tax Clearance
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. 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. Bidders may also submit a printed TCS certificate together with the bid (valid and original). In Bids where Consortia/Joint Venture/Sub-contractors are involved each party must submit a separate and Original Valid Tax Clearance Certificate.

C.2.3 Check documents
Delete the clause content and replace with the following:
The Tenderer should check the tender documents on receipt for completeness, missing or duplicated pages, indistinct figures or writing and any obvious errors. The Tenderer must notify the Employer's agent at once of any such problems identified

C.2.7 Clarification meeting
Add the following after the second sentence:
The arrangements for the site visit/clarification meeting are as stated on the General Tender Information page and in the Responsiveness Criteria (if applicable). Failure to provide proof of attendance of this clarification meeting will result in disqualification of the tender. The applicable schedule in the returnable documents must be signed by employer **or** employer's agent as proof of attendance or the signed (signed by attending tenderers) attendance register should be attached to this schedule.

Tenderers should be represented at the clarification meeting by a person who is suitably qualified and experienced to comprehend the implications of the work involved. The Employer or Employer's Agent cannot be held liable for any information discussed during the Clarification Meeting not correctly carried forward to the authorised person signing the tender document.

C.2.8 Seek Clarification

Add the following after the first sentence:

The tenderer warrants that it has:

- a) inspected the Specifications and read and fully understood the Conditions of Contract.
- b) read and fully understood the whole text of the Specifications and Price Schedule and thoroughly acquainted itself with the nature of the goods proposed and generally of all

matters which may influence the Contract.

- c) visited the site(s) where delivery of the proposed works will take place, carefully examined existing conditions, the means of access to the site(s), the conditions under which the delivery is to be made, and acquainted itself 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 construction equipment to and from the site(s) and made the necessary provisions for any additional costs involved thereby.
- d) requested the Employer to clarify the requirements contained in the Specifications and Price Schedule, the exact meaning or interpretation of which is not clearly intelligible to the tenderer.
- e) received any notices to the tender documents which have been issued in accordance with the Employer's SCM Policy.

The Employer will therefore not be liable for the payment of any extra costs resulting from any claim submitted by the tenderer arising from any alleged ambiguity or uncertainty contained in the tender document.

C.2.11 Alterations to documents

Delete the first sentence and replace with the following:

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer in writing, or necessary to correct errors made by the tenderer.

C.2.12 Alternative tender offers

C.2.12.1 *Add the following to C.2.12.1 at the end of the first sentence:*

If a tenderer wishes to submit an alternative tender offer, he shall do so as a separate offer on a separate set of tender documents. The alternative tender offer shall be submitted in a separate sealed envelope on a separate Form of Offer, both clearly marked "Alternative Tender" in order to distinguish it from the main tender offer.

While it is not necessary to duplicate all parts of the main tender offer, the alternative tender offer shall be supported by the following documents as applicable:

- a) the schedule that compares the alternative(s) offered with the requirements of the issued tender documents
- b) preliminary designs, calculations, drawings and all other pertinent technical information and characteristics must be submitted with the alternative tender offer, in order to enable the Employer to evaluate the efficacy of the alternatives proposed
- c) revised Bills of Quantities, or parts thereof, highlighting the changes made, together with a revised Summary, the total of which has been carried to the Form of Offer
- d) details of any proposed amendments to the Pricing Assumptions

An alternative of the highest ranked acceptable main tender offer that is priced higher than the main tender offer may be recommended for award, provided that the ranking of the alternative tender -offer is higher than the ranking of the next ranked acceptable main tender offer.

The Employer's costs in confirming the acceptability of the alternative offer will be, *inter alia*, considered in considering the alternative offer.

The Employer will not be bound to consider alternative tenders and shall have sole discretion in this regard.

If the alternative is accepted, the Contractor shall accept full responsibility that the alternative offer complies in all respects with the Employer's standards and requirements.

C.2.13 Submitting a tender offer

Add the following to C.2.13.1 at the end of the first sentence:

C.2.13.1 Where the tendering entity is a joint venture it is recommended that the standard CIDB Joint Venture Agreement be used.

Delete the following word from C.2.13.2 and add the following sentence after the first sentence:
C.2.13.2 Delete "either electronically (if they were issued in electronic format) or". No electronic submissions will not be accepted unless specifically requested by the Employer in writing.

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 0 (nil) 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, authenticated by a notary public or other official deputed to witness sworn statements, 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.

Delete the clause and replace with the following.
C.2.13.5 The tender submission details are all described on the General Tender Information page.

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: Langeberg Municipal Office
Physical address: Langeberg Municipality, Main Street 28, Ashton
Identification details: Tender number: T13/2025
Title of tender: BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Sealed tenders with the name and address of the tenderer, the tender No. and title and the closing date indicated on the envelope, must be placed in the appropriate 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 (C.3.5).

Add the following new Clauses after C.2.13.9 and before C.2.14:
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.2.13.11 The Employer shall not formally issue tender documents in electronic format and shall only issue tender documents in hardcopy. An electronic version of the issued tender documents, or elements thereof, may be made available to the tenderer at the Employer's discretion, upon written request in terms of this clause, subject to the following:

- a) No Electronic copies of the issued tender documents including BOQ, or parts thereof, will be provided to tenderers.
- b) The Employer shall not accept tenders submitted in electronic format. Only those tenders that have been completed on the issued hard copy tender document shall be considered.
- c) Where Addenda have been issued which amend the Bills of Quantities, then the printed Bills of Quantities shall take these into account. The pages of the issued Bills of Quantities should not be removed from the tender document.
- 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. 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 documents as contemplated in C.2.11, shall render the tender non-responsive. 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.

C.2.15 Closing time

Add the following to C.2.15.1 after the first sentence:

C.2.15.1 The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.

C.2.16 Tender offer validity

Add the following to C.2.16.1 after the first sentence:

C.2.16.1 The tender offer validity period is **120 days**.

C.2.16.2 *Delete the clause and replace with the following:*

Notwithstanding the period stated above, bids shall remain valid for acceptance for a period of twelve (12) months after the expiry of the original validity period, unless the Municipality is notified in writing of anything to the contrary by the bidder. The validity of bids may be further extended by a period of not more than six months subject to mutual agreement and administrative processes and upon approval by the Municipal Manager.

C.2.17 Clarification of tender offer after submission

Add the following to C.2.17 at the end of the third sentence:

A tender will be rejected as non-responsive if the tenderer fails to provide any clarification or supporting documents requested by the Employer within the time for submission stated in the Employer's written request for such clarification or documents.

C.2.18 Provide other material

Delete the following word in C.2.18.1:

C.2.18.1 "notarized"

Add the following to C.2.18.1 at the end of the first paragraph:

Provide, on written request by the Employer, where the transaction value (tendered amount) inclusive of VAT **exceeds R 10 million**:

- a) audited annual financial statement for the past 3 years, or for the period since establishment if established during the past 3 years, if required by law to prepare annual financial statements for auditing;
- b) a certificate signed by the tenderer certifying that the tenderer has no undisputed commitments for municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 30 days;
- c) particulars of any contracts awarded to the tenderer by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract;
- d) a statement indicating whether any portion of the goods or services are expected to be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality or municipal entity is expected to be transferred out of the Republic.

Each party to a Consortium/Joint Venture shall submit separate certificates/statements in the above regard.

Add the following Clauses after C.2.18.2 and before Clause C.2.19:

C.2.18.3 Tenderers shall fully cooperate with the Employer's external service provider appointed to perform a due diligence review and risk assessment upon receipt of such written instruction from the

Employer.

Failure to fully cooperate could result in a tender being declared as non-responsive.

C.2.18.4 Compliance with Occupational Health and Safety Act, 85 of 1993

Tenderers are to note the requirements of the Occupational Health and Safety Act, 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 Tenderer shall submit with his tender or upon request, appended to Schedule 21: Health and Safety Plan in T2.2: Returnable Schedules, a draft Health and Safety Plan in respect of the Works in sufficient detail to demonstrate the necessary competencies and resources to perform the construction work all in accordance with the Act, Regulations and Health and Safety Specification in Part C6 in the Scope of Work.

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, 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 Contractor shall prepare and maintain a Health and Safety File in respect of the project, which shall always be available for inspection on Site 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 C1.5 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.2.23 Certificates

Add the following after the first sentence:

The tenderer is required to submit the following:

C.2.23.1 Evidence of tax compliance

Tenderers shall be registered with the South African Revenue Service (SARS) and their tax affairs must be in order and they must be tax compliant subject to the requirements of clause C.2.1.4.2.h. In this regard, it is the responsibility of the Tenderer to submit evidence in the form of a valid Tax Clearance Certificate issued by SARS to the Employer at the Supplier Management Unit located within the Supplier Management / Registration Office 28 Main Street, Ashton. (Tel 023 656 8200) or included with this tender. The tenderer must also provide its Tax Compliance Status PIN number on the **Compulsory Enterprise Questionnaire**

Each party to a Consortium/Joint Venture shall submit a separate Tax Clearance Certificate.

Before making an award the Langeberg Municipality must verify the bidder's tax compliance status.

Where the recommended bidder is not tax compliant, the bidder should be notified of the non-compliant status and be requested to submit to the Langeberg Municipality, within 7 working days, written proof from SARS that they have made arrangement to meet their outstanding tax obligations. The proof of tax compliance submitted by the bidder must be verified by the Langeberg Municipality via CSD or e-Filing. The Langeberg Municipality should reject a bid submitted by the bidder if such bidder fails to provide proof of tax compliance within the timeframe stated herein.

Only foreign suppliers who have answered “NO” to all the questions contained in the Questionnaire to Bidding Foreign Suppliers section on the **Details of Tenderer** pages of the tender submission, are not required to register for a tax compliance status with SARS.

C.2.23.2 Broad-Based Black Economic Empowerment Status Level Documentation

In order to qualify for preference points, it is the responsibility of the tenderer to submit documentary proof, either as certificates, sworn affidavits or any other requirement prescribed in terms of the B-BBEE Act, of its B-BBEE status level of contribution in accordance with the applicable Codes of good practise as issued by the Department of Trade and Industry, to the LANGEBERG MUNICIPALITY at the Supplier Management Unit located within the Supplier Management / Registration Office, 28 Main Street, Ashton.(Tel: 023 626 8200) or included with the tender submission.

Consortiums/Joint Ventures will qualify for preference points, provided that the **entity** submits the relevant certificate/scorecard in accordance with the applicable codes of good practise. Note that, in the case of unincorporated entities, a verified consolidated B-BBEE scorecard must be submitted in the form of a certificate with the tender.

Tenderers are further referred to the content of the **Preference Schedule** for the full terms and conditions applicable to the awarding of preference points.

The applicable code for this tender is the **Amended Codes for Measuring Broad-Based Black Economic Empowerment in the Construction Sector**.

The tenderer shall indicate in Section 25 of the **Preference Schedule** the Level of Contribution in respect of the enterprise status or structure of the tendering entity (the supplier).

Add the follow new clause after C.2.23.2

C.2.24 Proposed Deviations and Qualifications

Where the tenderer cannot tender in all respects in accordance with the provisions contained in the tender documents, all deviations therefrom shall be clearly and separately listed in the schedule titled **Proposed Deviations and Qualifications by Tenderer** in T2.2 Returnable Schedules, or in a tenderer's covering letter expressly referenced in this schedule.

The tenderer accept that the Employer will examine such deviations in terms of clause C.3.8.2 and shall not be bound to accept any such deviations or qualifications.

It must be clearly stated by the tenderer whether the sum tendered in the Tender Offer includes for all such deviations or qualifications listed or referred to in the schedule titled **Proposed Deviations and Qualifications by Tenderer** or not.

C.3 The Employer's undertakings

C.3.2 Issue Addenda

Delete the first sentence and replace with:

If necessary, issue addenda in writing that may amend or amplify the tender documents to each tenderer during the period from the date the tender documents are available until one week before the tender closing time stated in the Tender Data. The Employer reserves its rights to issue addenda less than one week before the tender closing time in exceptional circumstances.

Add the following to C.3.2 at the end of the paragraph:

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. It is therefore of great importance that the contact details provided during the compulsory clarification meeting is legible and contactable.

C3.4 Opening of tender submissions

Add the following to C.3.4.2 at the end of the paragraph:

The location for opening of the tender offers is the Tender Submission Office at the address as stated on the General Tender Information page.

C.3.8 Test for responsiveness

C.3.8.2 *Replace the final sentence of C.3.8.2 with the following:*

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

Add the following after clause C.3.8.2

C.3.8.3 The Employer reserves the right to accept a tender offer which does not, in the Employer's opinion, materially and/or substantially deviate from the terms, conditions, and specifications of the tender documents.

C.3.9 Arithmetical errors, omissions, and discrepancies

Add the following after clause C.3.9.4

C.3.9.5 In the event of tendered rates or lump sums being declared by the Employer to be unacceptable to it because they are not priced, 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 in accordance with this clause.

Should the Tenderer fail to amend his tender in a manner acceptable to and within the time stated by the Employer, the Employer may declare the tender as non-responsive.

C.3.10 Clarification of a tender offer

Delete the clause and replace with the following:

C3.10 The Employer may, after the closing date, request additional information or clarification from any tenderer, in writing on any matter affecting the evaluation of the tender offer or that could give rise to ambiguity in a contract arising from the tender offer, which written request and related response shall not change or affect their competitive position or the substance of the tenderer's offer.

C.3.11 Evaluation of tender offers

Add the following Clauses after clause C.3.11.1 and before Clause C.3.12

C.3.11.2 Where the scoring of functionality forms part of a bid process, each member of the Bid Evaluation Committee must individually score functionality. The individual scores must then be interrogated and calibrated if required where there are significant discrepancies. The individual scores must then be added together and averaged to determine the final score.

C.3.11.3 The tender will be evaluated in terms of the requirements of the Preferential Procurement Regulations of 2022 as follows:

C.3.11.3.1 The preference point system applicable to this tender is the 80/20 preference point system.

C.3.11.3.2 Price and specific goals will be scored, as relevant, to two decimal places.

C.3.11.3.3 Confirm that tenderers are eligible for the preferences claimed in accordance with the provisions of the tender data and reject all claims for preferences where tenderers are not eligible for such preferences.

Points will be awarded to tenderers who are eligible for preferences in terms of the **Preference Schedule** (where preferences are granted in respect of B-BBEE contribution) which is included in T2.2 Returnable Schedules.

The terms and conditions of the **Preference Schedule** shall apply in all respects to the tender evaluation process and any subsequent contract.

In addition, the various deemed B-BBEE Status Level of Contributor in accordance with the relevant Codes can be attained and such tenderers must be awarded the appropriate number of points.

It should be noted that such Deemed B-BBEE Status Level of Contribution can be enhanced or discounted in accordance with the relevant clauses in the applicable Codes.

C.3.11.4 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:

- a) reasonableness of the financial offer
- b) reasonableness of unit rates and prices
- c) the tenderer's ability to fulfil its obligations in terms of the tender document, that is, that the tenderer can demonstrate that he/she/it possesses the necessary professional and technical qualifications, professional and technical competence, financial resources (Bank Ratings will be requested), equipment and other physical facilities, managerial capability, reliability, capacity, experience, reputation, personnel to perform the contract, etc.; the Employer reserves the right to consider a tenderer's existing contracts with the Employer in this regard
- d) any other matter relating to the submitted bid, the tendering entity, matters of compliance, verification of submitted information and documents.

The conclusions drawn from this risk analysis will be used by the Employer in determining the acceptability of the tender offer in terms of C.3.13.

C.3.13 Acceptance of tender offer

Delete first sentence of C.3.13 and replace with the following):

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

Delete C.3.13 a) and replace with the following):

a) is not under restrictions, has any principals who are under restrictions, or is not currently a supplier to whom notice has been served for abuse of the supply chain management system, preventing participation in the employer's procurement;

Add the following below C.3.13 f)

If an award cannot be made in terms of anything contained herein, the Employer reserves the right to consider the next ranked tenderer(s). The Employer does not bind himself to accept the lowest priced tender, highest evaluation points tender or any tender offer. The Employer has the right to

accept any part of a tender as he may deem expedient subject to negotiation with the successful tenderer for the whole tender.

- C.3.13.1 The Employer reserves the right not to make an award, or revoke an award already made, where the implementation of the contract may result in reputational risk or harm to the Langeberg Municipality as a result of (inter alia):
- a) reports of poor governance and/or unethical behaviour;
 - b) association with known family of notorious individuals;
 - c) poor performance issues, known to the Langeberg Municipality;
 - d) negative social media reports; and
 - e) adverse assurance (e.g. due diligence) report outcomes.

- C.3.13.2 The Employer reserves the right to nominate an alternative bidder at the time when an award is made and in the event that a contract is terminated during the execution thereof, the LANGEBERG MUNICIPALITY may consider the award of the contract, or non-award, to the alternative bidder in terms of the procedures included its SCM Policy.

- C.3.13.3 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.

- C.3.13.4 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 after the first sentence:

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

Add the following Clauses after C.3.18:

- C.3.19 Negotiations with preferred tenderers
The Employer may negotiate the final terms of a contract with tenderers identified through a competitive tendering process as preferred tenderers provided that such negotiation:
- a) does not allow any preferred tenderer a second or unfair opportunity;
 - b) is not to the detriment of any other tenderer; and
 - c) does not lead to a higher price than the tender as submitted.

If negotiations fail to result in acceptable contract terms, the Municipal Manager (or his delegated authority) may terminate the negotiations and cancel the tender or invite the next ranked tenderer for negotiations. The original preferred tenderer should be informed of the reasons for termination of the negotiations. If the decision is to invite the next highest ranked tenderer for negotiations, the failed earlier negotiations may not be reopened by the LANGEBERG MUNICIPALITY.

Minutes of any such negotiations shall be kept for record purposes.

The provisions of this clause will be equally applicable to any invitation to negotiate with any other tenderers.

In terms of the PPPFA Regulations, 2017, tenders must be cancelled in the event that negotiations fail to achieve a market related price with any of the three highest scoring tenderers.

- C.3.20 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/Employer's Agent after the submission of any tender and the Tenderer shall be deemed to have:

- a) inspected the Contract Drawings and read and fully understood the Conditions of Contract.
- b) 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.
- c) 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 construction equipment to and from the site and made the necessary provisions for any additional costs involved thereby.
- d) 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.
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/Employer's Agent at once to have the same rectified, as no liability will be admitted by the Employer/Employer's Agent in respect of errors in any tender due to the foregoing.
- e) received any Addenda to the tender documents which have been issued in accordance with the Employer's Supply Chain Management Policy.

C.3.21 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;
- 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;
 - whether a spouse, child or parent of the provider or of a director, manager, shareholder 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; or
- c) 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.

The Contract Price shall not be subject to any contract price adjustment, the rates and prices tendered in the bills of quantities shall. In this regard, tenderers shall complete Schedule 1, Part T2.2: Returnable Schedules: Compulsory Enterprise Questionnaire. Failure to complete this Schedule may result in the tender not being considered.

C.3.22 Combating abuse of the Supply Chain Management Policy

In terms of the Municipality's 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 Municipality 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 Part T2.2: Returnable Schedules: Declaration of Tenderer's Past Supply Chain Management Practices (in terms of the Municipal Finance Management Act). Failure to complete this Schedule may result in the tender not being considered.

C.3.23 UIF payments

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

C.3.24 Price variations

Tender document or part thereof. Only those tenders that have been completed on the issued hard copy tender 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/Employer's Agent 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.

Adjustment in rates or prices shall be subject to the provisions of Part C1.2: Contract Data.

C.3.25 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.2.13.2 and 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.
- 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.

- C.3.26 Bidders who do not submit B-BBEE Status Level Verification Certificates or are non-compliant contributors to B-BBEE do not qualify for preference points for B-BBEE but should not be disqualified from the bidding process. They will score points out 80 for price only and zero (0) points out of 10 for B-BBEE. A trust, consortium or joint venture must submit a consolidated B-BBEE Status Level Verification Certificate for every separate bid

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 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 is in a position to 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 in order 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 manner in which 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 of C.8 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 into 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 in order 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 complies 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, in order 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 as a consequence:
 - a) an individual firm, or a joint venture as a whole, 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 Non-disclosure
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 as a result 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 by definition 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 or not tender offers are complete
- c) Determine whether or not 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 into 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.

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BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

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T2.1 List of Returnable Documents

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

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T2.2 Returnable Schedules

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TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

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:

Section 2: VAT registration number, if any:

Section 3: CIDB registration number, if any:

Section 4a: National Treasury Central Supplier Database registration number:

Section 4b: SARS Tax Compliance Status PIN:

Section 5: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

Section 6: Particulars of companies and close corporations

Company registration number... ..

Close corporation number... ..

Tax reference number... ..

Section 7: MBD4 – Attached to this document

Section 8: MBD6 – Attached to this document

Section 9: MBD8 – Attached to this document

Section 10: MBD9 – Attached to this document

Section 11: Foreign Bidding Suppliers	
Is tenderer the accredited representative in South Africa for the Goods / Services / Works offered?	☐ Yes ☐ No If yes, enclose proof
Is tenderer a foreign based supplier for the Goods / Services / Works offered?	☐ Yes ☐ No If yes, answer the Questionnaire to Bidding Foreign Suppliers (below)
Questionnaire to Bidding Foreign Suppliers	
a) Is the tenderer a resident of the Republic of South Africa or an entity registered in South Africa?	☐ Yes ☐ No
b) Is the tenderer a resident of the Republic of South Africa or an entity registered in South Africa?	☐ Yes ☐ No
c) Does the tenderer have a permanent establishment in the Republic of South Africa?	☐ Yes ☐ No
d) Does the tenderer have any source of income in the Republic of South Africa?	☐ Yes ☐ No
e) Is the tenderer liable in the Republic of South Africa for any form of taxation?	☐ Yes ☐ No
The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise: i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order; ii) confirms that the neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004 or Database of Restricted Suppliers; iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption; iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and v) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.	

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 2: Clarification meeting attendance certificate

Refer to tender conditions C.2.7 in section T1.2 Tender data

This is to certify that I/we,
(the representative(s))

representing (the tenderer)

of address

Telephone and cellphone number

fax number

on (date)

attended the clarification meeting, have examined the Site of the Works and its surroundings for which I/we am/are submitting this Tender and have, so far as is practicable, familiarized myself/ourselves with all the information, risks, contingencies and other circumstances which may influence or affect my/our Tender.

Attendance of the above person(s) at the Clarification Meeting is confirmed by:

EMPLOYER'S AGENT / REPRESENTATIVE: . (Name).....

SIGNED BY EMPLOYER'S AGENT / REPRESENTATIVE:

.....

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 3: Certificate of Independent Tender determination (MBD9)

I, the undersigned, in submitting this tender for TENDER NO. **T13/2025: BREDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON** in response to the invitation for the tender made by the Langeberg Municipality, 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 Tenderer)

1. I have read, and I understand the contents of this Certificate;
2. I understand that this tender will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the tenderer to sign this Certificate, and to submit this tender on behalf of the tenderer;
4. Each person whose signature appears on this tender has been authorized by the tenderer to determine the terms of, and to sign, the tender, on behalf of the tenderer;
5. For the purposes of this Certificate and this tender, I understand that the word "competitor" shall include any individual or organization, other than the tenderer, whether affiliated with the tenderer or not, who:
 - (a) has been requested to submit a tender in response to this invitation to tender;
 - (b) could potentially submit a tender in response to this invitation to tender, based on their qualifications, abilities, or experience; and
 - (c) provides the same goods and services as the tenderer and/or is in the same line of business as the tenderer;
6. The tenderer has arrived at this tender independently from, and without consultation, communication, agreement, or arrangement with any competitor. However, communication between partners in a joint venture or consortium¹ will not be construed as collusive tendering;
7. In particular (without limiting the generality of paragraph 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 tender;
 - (e) the submission of a tender which does not meet the specifications and conditions of the tender; or
 - (f) tendering with the intention not to win the tender;
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 invitation to tender relates;
9. The terms of this tender have not been, and will not be, disclosed by the tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender 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 tenders and contracts, tenders 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.

¹ 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.

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 4: Certificate of Authority (for Companies/Joint Ventures/etc.)

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.

Date

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. Lead partner need to be clearly stated.

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 5: Declaration of Tenderer's past Supply Chain Management practices (MBD8)

Where the entity tendering is a joint venture, each party to the joint venture must sign a declaration in terms of the Municipal Finance Management Act, 56 of 2003, and attach it to this schedule.

1 The tender offer of any tenderer may be rejected if that tenderer or any of its directors/members 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).

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

Item	Question	Yes	No
2.1	Is the Tenderer or any of its directors listed on the National Treasury's Database of Restricted Suppliers as a company or person prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the <i>audi alteram partem</i> rule was applied). The Database of Restricted Suppliers now resides on the National Treasury's website www.treasury.gov.za and can be accessed by clicking on its link at the bottom of the home page.	Yes ☐	No ☐
2.1.1	If so, furnish particulars:		
2.2	Is the Tenderer 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, 12 of 2004? The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.	Yes ☐	No ☐
2.2.1	If so, furnish particulars:		
2.3	Was the Tenderer 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 ☐

2.3. 1	If so, furnish particulars:		
2.4	Does the Tenderer 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 ☐
2.4. 1	If so, furnish particulars:		
2.5	Was any contract between the Tenderer 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 ☐
2.5. 1	If so, furnish particulars:		

I, _____, the
undersigned,
(full name in block letters)

certify that the information furnished on this declaration form is true and correct, and accept that, in addition to cancellation of a contract, action may be taken against me should this declaration prove to be false.

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANEGERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 6: Declaration of interest – State Employees (MBD 4 amended)

- No bid will be accepted from:
 - 1.1 persons in the service of the state¹, or
 - 1.2 if the person is not a natural person, of which any director, manager or principal shareholder² or stakeholder is in the service of the state, or
 - 1.3 from persons, or entities of which any director, manager or principal shareholder or stakeholder, has been in the service of the Langeberg Municipality during the twelve (12) months after the Langeberg Municipality employee has left the employ of the Langeberg Municipality, or
 - 1.4 from an entity who has employed a former Langeberg Municipality employee who was at a level of T14 or higher at the time of leaving the LANEGERG Municipality's employ and involved in any of the Langeberg Municipality's bid committees for the bid submitted, if:
 - 1.4.1 the Langeberg Municipality employee left the Langeberg Municipality's employment voluntarily, during a period of twelve (12) months after the Langeberg Municipality employee has left the employ of the Langeberg Municipality;
 - 1.4.2 the Langeberg Municipality employee left the Langeberg Municipality's employment whilst facing disciplinary action by the Langeberg Municipality, during a period of twenty-four (24) months after the Langeberg Municipality employee has left the employ of the Langeberg Municipality, or any other period prescribed by applicable legislative provisions, after having left the Langeberg Municipality's employ.
- Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the tenderer 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.

- 3.1 Full Name of tenderer or his or her representative:.....
- 3.2 Identity Number:.....
.....
- 3.3 Position occupied in the Company (director, trustee, shareholder²):.....
- 3.4 Company or Close Corporation 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 who may be involved with the evaluation and or adjudication of this bid? **YES / NO**

3.10.1 If yes, furnish particulars:

.....
.....
.....

3.11 Are you, aware of any relationship (family, friend, other) between any other supplier and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid? **YES / NO**

3.11.1 If yes, furnish particulars

.....
.....
.....

3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? **YES / NO**

3.12.1 If yes, furnish particulars:

.....
.....
.....

3.13 Are any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? **YES / NO**

3.13.1 If yes, furnish particulars:

.....
.....
.....

13.4 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract? **YES / NO**

3.14.1 If yes, furnish particulars:

.....
.....
.....

3.15 Have you, or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company been in the service of the LANGEBERG Municipality in the past twelve months? **YES / NO**

3.15.1 If yes, furnish particulars:

.....
.....
.....

3.16 Do you have any employee/s who was/were in the service of the LANGEBERG Municipality at a level of T14 or higher at the time they left the employ of the LANGEBERG Municipality, and who was involved in any of the LANGEBERG Municipality's bid committees for this bid? **YES / NO**

3.16.1 If yes, furnish particulars:

.....
.....
.....

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

Full Name	Identity Number	State Employee Number

If the above table does not sufficient to provide the details of all directors / trustees / shareholders, please append full details to the tender submission.

The tenderer hereby certifies that the information set out in this schedule and/or attached thereto is true and correct, and acknowledges that failure to properly and truthfully complete this schedule may result in the tender being disqualified, and/or (in the event that the tenderer is successful) the cancellation of the contract, restriction of the tenderer or the exercise by the employer of any other remedies available to it

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) *an executive 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.*

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 7: Authorisation for the deduction of outstanding amounts owed to the Langeberg Municipality

To: THE MUNICIPAL MANAGER, LANGEBERG MUNICIPALITY

From: _____
(Name of tenderer)

The tenderer:

- a) hereby acknowledges that according to SCM Regulation 38(1)(d)(i) the Municipal Manager may reject the tender of the tenderer if any municipal rates and taxes or municipal service charges owed by the tenderer (or any of its directors/members/partners) to the LANGEBERG MUNICIPALITY, or to any other municipality or municipal entity, are in arrears for more than 3 (three) months; and
- b) therefore hereby agrees and authorises the LANGEBERG MUNICIPALITY to deduct the full amount outstanding by the Tenderer or any of its directors/members/partners from any payment due to the tenderer; and
- c) confirms the information as set out in the tables below for the purpose of giving effect to b) above;
- d) The tenderer hereby certifies that the information set out in this schedule and/or attached hereto is true and correct, and acknowledges that failure to properly and truthfully complete this schedule may result in steps being taken against the tenderer, the tender being disqualified, and/or (in the event that the tenderer is successful) the cancellation of the contract and/or steps in terms of abuse of the Supply Chain Management Policy.

Physical Business address of the Tenderer	Municipal Account number(s)

If there is not enough space for all the names, please attach the additional details to the Tender Document

Name of Director / Member / Partner	Identity Number	Physical residential address of Director / Member / Partner	Municipal Account number(s)

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 8: Declaration in respect of compliance with labour legislation

Tenderers must be registered with the relevant Bargaining Council as contained in the tender conditions and must append to this schedule a certificate of compliance / letter of good standing in terms of the relevant Government Gazette that indicates compliance / validity at the time of tender award.

Each party to a Consortium/Joint Venture shall append separate certificates in the above regard.

Declaration in respect of labour legislation

The tenderer, by signing this schedule, declares that it will comply with all labour legislation, as may be applicable.

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 9: Declaration for procurement above R10 million (MBD5)

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

1. Are you by law required to prepare annual financial statements for auditing?***YES / NO**
 - 1.1. If yes, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years.
.....
.....
2. Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days?***YES / NO**
 - 2.1 If no, this serves to certify that the bidder has no undisputed commitments for municipal services towards any municipality for more than three months or other service provider in respect of which payment is overdue for more than 30 days.
 - 2.2 If yes, provide particulars.
.....
.....
3. Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract?***YES / NO**
 - 3.1 If yes, furnish particulars
.....
.....
4. Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic?***YES / NO**
 - 4.1 If yes, furnish particulars
.....
.....

** Delete if not applicable*

CERTIFICATION:

I, THE UNDERSIGNED

(NAME).....

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS CORRECT. I ACCEPT THAT THE STATE MAY ACT AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 10: Confirmation of Central Supplier Database (CSD) registration

<u>CENTRAL</u> SUPPLIER DATABASE REGISTRATION		
COMPANY NAME	REGISTERED YES/NO	REGISTRATION NUMBER IF APPLICABLE

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 11: Tax Clearance Certificate

<u>SARS Tax Compliance Status PIN</u>	
COMPANY NAME	SARS Tax Compliance Status PIN

Bidders are required to submit their unique personal identification number (pin) issued by SARS to enable the organ of state to view the taxpayers' profile and tax status.

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.

Bidders may also submit a printed TCS certificate together with the bid (valid and original). In Bids where Consortia/Joint Venture/Sub-contractors are involved each party must submit a separate and Original Valid Tax Clearance Certificate.

Failure to submit proof of good standing with SARS (Tax Clearance Certificate) will result in the invalidation of the tender/bid. **Certified copies of the Tax clearance Certificate will not be acceptable.**

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 12: Confirmation of Contractor Enterprise Registration

CIDB REGISTRATION

We hereby confirm our registration on Construction Industry Development Board (CIDB) Contractor Database:

COMPANY NAME	CIDB CONTRACTOR GRADING DESIGNATION	CRS REGISTRATION NUMBER AS APPLICABLE

I/We attach a printed copy of the Active Contractor's Listing off the CIDB website www.cidb.org.za as documentary proof of the Contractor's Registration issued by the Construction Industry Development Board (CIDB) 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.

Failure to affix such documentation as proof of Contractor Enterprise registration as prescribed to this Schedule shall result in this tender not being further considered for the award of the Contract.

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

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 13: Tenderer's banking details

Notes to tenderer:

- 1. The tenderer shall attach to this form a letter from the bank at which he declares he conducts his account. The contents of the bank's letter must state the credit rating (Bank Code) that it, in addition to the information required below, accords to the tenderer for the business envisaged by this tender. The Employer will also do an independent Bank Rating investigation via the Employer's Agent's independent source.**
- 2. The tenderer's banking details as they appear below shall be completed.**
- 3. If the tenderer is a joint venture enterprise, details of all the members of the joint venture shall be similarly provided and attached to this form. The nominated bank account that will be used for this project need to be completed below. Only one bank account may be used, shown below.**

The method used to obtain a bank rating is an online service provided by ABSA bank. If the tendered contract period is three months or more, an average 3-month cash flow for each tender submitted will be calculated and used as input into the online service. This process ensure that an equivalent method is used when determining the bank ratings of each tenderer. The Employer will obtain codes from the relevant independent financial institutions. The evaluation of your offer will be based on the Bank Rating received from our own independent investigation and not the Bank Rating attached by the tenderer himself. This is to ensure a fair and equal evaluation of bids.

Bidders must provide their banking details below.

The tenderer shall provide the following:

Name of Account Holder:

Account Number:

Bank name:

Branch Number:

Bank and branch contact details

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

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 14: Schedule of work experience of Tenderer

The tenderer shall insert in the spaces provided below a list of completed contracts and those currently being undertaken with a scope of similar nature. This information is deemed to be material to the award of the Contract.

Projects of a similar scope and nature is regarded as:

Building of pumpstations for municipal water or sewer bulk infrastructure, installation of pipes by trench excavations, bedding, backfilling and compaction of various materials, construction of various brick, mortar and concrete structures for water and reticulation purposes, i.e.: valve chambers, thrust blocks, manholes, etc. to a value >R5m.

Please note that no tenderer will be contacted to clarify any experience or construction equipment, or plant submitted with this bid. If insufficient information is shown, the tenderer will not be contacted for clarification.

The information provided in this schedule will be utilized to calculate the pre-qualification functionality scores. Tenderers must have successfully completed (please note that current incomplete projects will not be included in the evaluation) at least 5 projects of a similar scope and nature in the last 10 years to score full marks on this criterion.

A detailed list of successfully completed projects must be completed below (or attached to this schedule).

COMPLETED SIMILAR 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

CURRENT SIMILAR PROJECTS				
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

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

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 15: Details of qualifications and experience of staff

Tenderers shall set out in the Schedule hereunder details of the Construction Manager and General Foreman's experience in work of a similar nature to that for which their Tender is submitted. Detailed, project specific CV's to be included in this Schedule. Failure to do so during tender phase will lead to disqualification of tenderer.

Construction managers must have successfully **completed** (please note that current projects will not be included in the evaluation) at least 3 projects of a similar scope and nature in the last 10 years to score full marks on this criterion. Projects of a similar scope and nature is regarded as:

Building of pumpstations for municipal water or sewer bulk infrastructure, installation of pipes by trench excavations, bedding, backfilling and compaction of various materials, construction of various brick, mortar and concrete structures for water and reticulation purposes, i.e.: valve chambers, thrust blocks, manholes, etc. to a value >R5m.

. Please note that no tenderer will be contacted to clarify any experience or construction equipment, or plant submitted with this bid. If insufficient information is shown, the tenderer will **not** be contacted for clarification.

CONSTRUCTION MANAGER/SITE AGENT	NAME:			
CLIENT/CLIENT AGENT'S NAME AND CONTACT DETAILS	NATURE OF WORK	POSITION HELD	VALUE OF WORK	YEAR COMPLETED

GENERAL FOREMAN/CONSTRUCTION SUPERVISOR	NAME:			
CLIENT/CLIENT AGENT'S NAME AND CONTACT DETAILS	NATURE OF WORK	POSITION HELD	VALUE OF WORK	YEAR COMPLETED

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

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDER RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 16: Schedule of construction equipment

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

CONSTRUCTION EQUIPMENT IMMEDIATELY AVAILABLE

DESCRIPTION, SIZE, CAPACITY	NUMBER

CONSTRUCTION EQUIPMENT ON ORDER

(State details of arrangements made, with delivery dates)

DESCRIPTION, SIZE, CAPACITY	NUMBER

CONSTRUCTION EQUIPMENT 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:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 17: Preliminary programme (for information purposes only)

The tenderer shall attach a preliminary programme, reflecting the proposed sequence and tempo of execution of the various activities comprising the work for the Contract, to this page.

This programme shall be in the form of a bar chart (Gantt chart) or similar acceptable time/activity form reflecting the proposed sequence and tempo of the various activities and the quantities that will be carried out every week under each of the elements, comprising the work for this contract. The programme shall also indicate the point where the tenderer intends to commence work operations and the direction in which the work will proceed. The working hours shall be indicated.

The tenderer shall also take into account the additional requirements stated in the Project Specifications when drawing up the programme.

Details of the preliminary programme shall be appended to this Schedule.

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

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 18: Proposed work plan

The tenderer shall append their proposed work plan to this Schedule.

It should be noted that while a programme may form part of the required work plan, more than a programme is expected in response to this requirement. The work plan must indicate the approach and methodology that the tenderer intends following to reach the required outcomes. The work plan must show that the tenderer has comprehended the Scope of Work and has good insight as to what actions or activities are required to comply with the Employer's objectives.

The proposed work plan must not exceed two A4 pages.

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY**TENDER NO. T13/2025****BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON****Schedule 19: Schedule of estimated monthly expenditure**

The tenderer shall state his estimated expenditure indicating the value of work done and materials not yet built into the Permanent Works for each month of the Contract period which he estimates will arise based on his preliminary programme and tendered rates, as set out in the table below. The total of the monthly amounts shall be equal to the tender sum.

MONTH	VALUE
SUBTOTAL	R
CONTINGENCIES (5%)	R
SUBTOTAL	R
VAT (15%)	R
TOTAL (INCLUDING VAT @ 15%)	R

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 20: Schedule of sub-contractors

We notify you that it is our intention to employ the following sub-contractors for work (excluding work covered by provisional sums and contingencies) in this contract.

Acceptance of this tender shall not be construed as approval of all or any of the listed sub-contractors. Should any of the sub-contractors not be approved subsequent to acceptance of the tender, this shall in no way invalidate the contract, and the tendered unit rates for the various items making up the work activities shall remain final and binding.

Local Sub-Contractors must be utilized.

SUB-CONTRACTORS		
Sub-contractor's name	Work activities to be undertaken by the Sub-contractor	Estimated value of work (Rand)

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

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 21: Health and Safety plan

Tenderers are referred to the requirements of Clause C.2.18.4 in Part T1.2 Tender Data and shall append the required draft Health and Safety Plan to this Schedule.

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

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 22: Proposed deviations and qualifications by tenderer

The Tenderer should record any **proposed** deviations or qualifications he may wish to make to the tender documents in this Returnable Schedule. Alternatively, a tenderer may state such proposed deviations and qualifications in a covering letter attached to his tender and reference such letter in this schedule. Any proposed deviations or qualifications contained in a covering letter which is not referenced in this schedule will not be considered.

The Tenderer's attention is drawn to clause C.3.8 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 qualifications are proposed, the schedule hereunder is to be marked NIL and signed by the Tenderer.

PAGE	CLAUSE OR ITEM	PROPOSED DEVIATION OR QUALIFICATION

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

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 23: Functionality criteria

The Tenderer shall provide information for the functionality criteria listed in this Returnable Schedule.

The Tenderer's attention is drawn to clause C.2.1.4.3 in the Tender Data for a more detailed explanation of the functionality criteria given in the table below and how the score will be calculated (with applicable values).

Please note that points scored for Quality (functionality) will not have an influence on the total tender evaluation points and will therefore not affect the ranking of the tenderers, it will only be regarded as a pre-qualification. The minimum points required to be eligible to tender is 70 out of a 100.

THE CRITERIA to be applied in evaluating the proposal is set out in the table below:

Calculate the points for functionality according to the following formula:

$$P_s = S_o / M_s \times A_p$$

Where

P_s	=	Percentage scored for functionality by bid under consideration
S_o	=	Total score of bid/proposal under consideration
M_s	=	Maximum possible score = 500
A_p	=	percentage allocated for functionality = 100

Total points by bidder on functionality:

i)	$P_{s(\text{Criterion 1})}$	= (Indicator allocated/scored out of 5) x weight
ii)	$P_{s(\text{Criterion 2})}$	= (Indicator allocated/scored out of 3) x weight
	$P_{s(\text{TOTAL})}$	= $[(P_{s(\text{Criterion 1})} + P_{s(\text{Criterion 2})}) / 5] \times 100$

Criteria can be amended to suit project complexity or omitted if not applicable.

Projects of a similar scope and nature is regarded as:

Building of pumpstations for municipal water or sewer bulk infrastructure, installation of pipes by trench excavations, bedding, backfilling and compaction of various materials, construction of various brick, mortar and concrete structures for water and reticulation purposes, i.e.: valve chambers, thrust blocks, manholes, etc. to a value >R5m.

Criterion	Weight
1) Relevant Experience (Returnable Schedule 14)	50%
2) Construction Manager Experience (Returnable Schedule 15)	50%
Total	100%

EVALUATION CRITERION 1

Tenderers must have successfully **completed** (please note that current projects will not be included in the evaluation) at least 5 projects of a similar scope and nature in the last 10 years to score full marks on this criterion. Refer to the table below for a measurement of how points will be awarded against this criterion.

A detailed list of successfully completed projects must be completed in/attached to **Schedule 14**.

Please note that no tenderer will be contacted to clarify any experience or construction equipment, or plant submitted with this bid. If insufficient information is shown, the tenderer will **not** be contacted for clarification.

5. RELEVANT EXPERIENCE	
INDICATOR	Evaluation Criteria for Relevant Experience: (number of similar projects completed by the contractor in the last 10 years)
0	The tenderer has completed zero projects in the last 10 years
1	The tenderer has completed only 1 project in the last 10 years
2	The tenderer has completed exactly 2 projects in the last 10 years
3	The tenderer has completed exactly 3 projects in the last 10 years
4	The tenderer has completed exactly 4 projects in the last 10 years
5	The tenderer has completed 5 or more projects in the last 10 years

EVALUATION CRITERION 2

Detailed, project specific CV's to be included in **Schedule 15** of the Returnable Documents. Failure to do so during tender phase will lead to disqualification of tenderer.

Construction managers must have successfully **completed** (please note that current projects will not be included in the evaluation) at least 5 projects of a similar scope and nature in the last 10 years to score full marks on this criterion. Refer to the table below for a measurement of how points will be awarded against this criterion.

Please note that no tenderer will be contacted to clarify any experience or construction equipment, or plant submitted with this bid. If insufficient information is shown, the tenderer will **not** be contacted for clarification.

If, during construction, the contractor wishes to replace the construction manager, the contractor will apply in writing to the Engineer as per clause 4.12 of the GCC 2015. Only similarly experienced and competent construction managers will be considered.

2. CONSTRUCTION MANAGER	
INDICATOR	Evaluation Criteria for Construction manager: (number of similar projects completed by the Construction manager in the last 10 years)
0	The Construction manager has completed zero projects in the last 10 years
1	The Construction manager has completed only 1 project in the last 10 years
3	The Construction manager has completed exactly 2 projects in the last 10 years
5	The Construction manager has completed exactly 3 or more projects in the last 10 years

The functionality proposal will be evaluated individually on score sheets, by a representative evaluation panel according to the evaluation criteria indicated above. All service providers who scored less than 70 out of 100 points for functionality will not be considered further. At least 3 evaluators will evaluate the quality schedules separately.

NB: Points scored for Quality (functionality) will not have an influence on the total tender evaluation points.

Where the entity tendering is a Joint Venture the tender must be accompanied by a statement describing exactly what aspects of the work will be undertaken by each party to the joint venture (appended to Schedule 4, Part T2.2: Returnable Schedules).

SIGNED ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 24: Preference Schedule: Measuring B-BBEE in the construction sector and Locality

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 80/20 preference point system.
- b) The 80/20 preference point system will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the accurate system once tenders are received.

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	80
SPECIFIC GOALS	20
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) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;
- (d) **“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
- (e) **“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 Application of preference point system

3.1.1.1 The Municipality will, in the tender documents, stipulate —

- (a) the preference point system applicable; and
- (b) any specific goal as envisaged in section 2(1)(d) and (e) of the Preferential Procurement Act.

3.1.1.2 If it is unclear whether the 80/20 or 90/10 preference point system applies—

- (a) in the case of a tender to generate income or to dispose of or lease assets, the highest acceptable tender; or
- (b) in the case of any other tender, the lowest acceptable tender, must be used to determine the applicable preference point system.

3.1.2 Points for Price: 80/20 preference point system for acquisition of goods or services with Rand value equal to or above R30 000 and up to R50 million

3.1.2.1 The following formula must be used to calculate the points out of 80 for price in respect of a tender with a Rand value equal to or above R30 000 and up to a Rand value of R50 million, inclusive of all applicable taxes:

$$P_s = 80 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where-

P_s = Points scored for price of tender under consideration;

P_t = Price of tender under consideration; and

$P_{\min}$ = Price of lowest acceptable tender.

3.1.2.2 A maximum of 20 points may be awarded to a tenderer for the specified goals envisaged in section 2(1)(d) and (e) of the Act.

3.1.2.3 The points scored must be rounded off to the nearest two decimal places.

3.1.2.4 The contract must be awarded to the tenderer scoring the highest points.

3.1.3 . Points for price: 90/10 preference point system for acquisition of goods or services with Rand value above R50 million

3.1.3.1 The following formula must be used to calculate the points out 90 for price in respect of a tender with a Rand value above R50 million, inclusive of all applicable taxes:

$$P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where-

P_s = Points scored for price of tender under consideration;

P_t = Price of tender under consideration; and

$P_{\min}$ = Price of lowest acceptable tender.

3.1.3.2 A maximum of 10 points may be awarded to a tenderer for the specified goals envisaged in section 2(1)(d) and (e) of the Act.

3.1.3.3 The points scored must be rounded off to the nearest 2 decimal places.

3.1.3.4 The contract must be awarded to the tenderer scoring the highest points.

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

The following formula must be used to calculate the points for price in respect of a tender to generate income or to dispose of or lease assets, with a Rand value equal to, or above R 30 000 and up to a Rand value of R50 million, inclusive of all applicable taxes:

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

Where-

Ps = Points scored for price of tender under consideration;

Pt = Price of tender under consideration; and

Pmax = Price of highest acceptable tender.

3.2.1 A maximum of 20 points may be awarded to a tenderer for the specified goals envisaged in section 2(1)(d) and (e) of the Act.

3.2.2 The points scored must be rounded off to the nearest 2 decimal places.

3.3.3 The contract must be awarded to the tenderer scoring the highest points.

3.3.4 Points for price:90/10 preference point system for tenders to generate income or to dispose of or lease assets with Rand value equal to or above R50 million

3.3.5 The following formula must be used to calculate the points for price in respect of a tender to generate income or to dispose of or lease assets, with a Rand value above R50 million, inclusive of all applicable taxes:

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

Where-

Ps = Points scored for price of tender under consideration;

Pt = Price of tender under consideration; and

Pmax = Price of highest acceptable tender.

- 3.3.6 A maximum of 10 points may be awarded to a tenderer for the specified goals envisaged in section 2(1)(d) and (e) of the Act.
- 3.3.7 The points scored must be rounded off to the nearest 2 decimal places.
- 3.3.8 The contract must be awarded to the tenderer scoring the highest points.

4. POINTS AWARDED FOR SPECIFIC GOALS

- 4.1 The tendering conditions will stipulate the specific goals, as contemplated in section 2(1)(d)(ii) of the Preferential Procurement Act, be attained.
- 4.2 A maximum of 20 points (80/20 preference points system) or 10 (90/10) preference points system), will be allocated for specific goals. These goals are:
- (a) contracting with persons, or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender or disability (BBBEE);
 - (b) Promotion of enterprises located in the municipal area
- 4.3 Regarding par 4.2 (a) 50% of the 20/10 points will be allocated to promote this goal and points will be allocated in terms of the BBBEE scorecard as follows:

B-BBEE Status Level of Contributor (Construction Sector)	Number of Points for Preference (80/20)	Number of Points for Preference (90/10)
1	20	10
2	18	9
3	14	7
4	12	5
5	8	4
6	6	3
7	4	2
8	2	1
Non-compliant contributor	0	0

- 4.4 A tenderer must submit proof of its BBBEE status level contributor [scorecard] to Construction Sector.
- 4.5 A tenderer failing to submit proof of BBBEE status level of contributor –
- 4.5.1 may only score in terms of the 80/90-point formula for price; and
 - 4.5.2 scores 0 points out of 10/5 BBBEE status level of contributor, which is in line with section 2 (1) (d) (i) of the Act, where the supplier or service provider did not provide proof thereof.

- 4.6 Regarding par 4.2 (b) 50% of the **20/10 points** will be allocated to promote this goal. Points will be allocated as follows.

Locality of Supplier	Points
Within the boundaries of the Municipality	10/5
Outside of the boundaries of the Municipality	0

- 4.7 The policy should not include Pre-qualification goals.
- 4.8 Any specific goal for which a point may be awarded, must be clearly specified in the invitation to submit a tender.
- 4.9 A tenderer failing to submit proof of required evidence to claim preferences for other specified goals, which is in line with section 2 (1) (d) (ii) of the Act.
- 4.9.1 may only score in terms of the 80/90-point formula for price; and
- 4.9.2 scores 0 points out of 10/5 of the relevant specific goals where the supplier or service provider did not stipulate.
- 4.10 The preference points scored by a tenderer must be added to the points scored for price.
- 4.11 The points scored must be rounded off to the nearest two decimal places.
- 4.12 The contract must be awarded to the tenderer scoring the highest procurement points.

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)
BBBEE preference points system Construction Sector	05	10		
Promotion of Enterprises located in the municipal area	05	10		

5. DECLARATION WITH REGARD TO COMPANY/FIRM

Name of company/firm.....

5.1. Company registration number:

5.2. 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]

5.3. 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.

.....
SIGNATURE(S) OF TENDERER(S)

SURNAME AND NAME:

.....

DATE:

.....

ADDRESS:

.....

.....

.....

.....

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Schedule 25: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 ON BEHALF OF TENDERER:	
NAME, SURNAME & POSITION	
DATE	

LANEGERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Part C1: Agreements and Contract Data

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LANGE BERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

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:

TENDER NO. T13/2025: BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

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:

Name of organization/tenderer:

Address of organization/tenderer:

.....

Name and signature of witness: Date:
.....

For official use.		
INITIALS OF MUN. OFFICIALS AT TENDER OPENING		
1.	2.	3.

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: 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 documents 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 parties have signed the table below and confirms receipt from the employer of one fully completed original copy of this agreement, including the schedule of deviations (if any). The tenderer (now contractor) shall within five working days of the agreement coming into effect notify the employer in writing of any reason why he cannot accept the contents of this agreement as a complete and accurate memorandum thereof, failing which the agreement presented to the contractor shall constitute the binding contract between the parties.

The Parties	Employer	Contractor
Business Name		
Business Registration		
Tax number (VAT)		
Physical Address		
Accepted contract sum (incl. tax)		
Accepted contract duration		
Signed (who by signature hereto warrants authority)		
Name of signatory		
Signed: Date		

Signed: Location		
Signed: Witness		
Name of Witness		

**ONLY TO BE
COMPLETED AT
ACCEPTANCE STAGE**

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.
- 1) 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.

ONLY TO BE
COMPLETED AT
ACCEPTANCE STAGE

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

C1.2 Contract Data (Part 1)

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 from 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.

Prepared by the South African Institution of Civil Employer's Agenting (SAICE) shall apply to and from the General Conditions of Contract for this Contract. Copies of these conditions of contract are obtainable from the South African Institution of Civil Employer's Agenting (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 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. Each item of data given below is cross-referenced to the clause in the General Conditions of Contract to which it mainly applies.

The General Conditions of Contract shall be read in conjunction with the variations, amendments and additions set out in the Special Conditions of Contract below.

In the event of any discrepancy and/or ambiguity in the Contract, the following precedence will govern (priority in order from highest to lowest):

1. Contract Data
2. Project Specifications
3. Drawings
4. Bill of Quantities
5. SANS 1200

SPECIAL CONDITIONS OF CONTRACT

In this regard, the Standard Conditions of Contract – GCC 2015 is amended by the numbered clauses set out below, as follows:

- (i) where the Standard Conditions of Contract – GCC 2015 contains no provision with the corresponding clause number, the clause set out herein is inserted into the Contract; and
- (ii) where the Standard Conditions of Contract – GCC 2015 contains a provision with the corresponding clause number, it is amended, as set out herein.

Save as amended in terms of this document, the provisions of the Standard Conditions of Contract – GCC 2015 shall remain unchanged.

1.1 Definitions

- 1.1.1.1 "agreed" means agreed by the Employer and the Contractor; or the Employer's Agent and the Contractor expressly authorised in terms of the Contract, unless specifically stated otherwise.
- 1.1.1.5 "Commencement Date" means the date that the Contract, made in terms of the Form of Offer and Acceptance, comes into effect by signing the Acceptance part and returning one fully completed original copy of this document, the Contract Agreement.
- 1.1.1.7 "Contract" means the documentation of the agreement between the parties in terms of the Form of Offer and Acceptance, and such written amendments or additions to the Contract as may be agreed and signed by both parties.
- 1.1.1.13 "Defects Liability Period" means the period stated in the Contract Data, commencing from the issue of the Certificate of Completion or Certificates of Completion in the event of more than one Certificate of Completion having been issued for different portions of the Works, during which the Contractor has both the right and the obligation to make good defects in the materials, Plant and workmanship covered by the Contract.
- 1.1.1.16 "Employer's Agents" means the person named as the Employers' Agent in the Contract Data, or any other person appointed from time to time by the Employer, and of whom the Contractors is notified, in writing, to act as the Employers Agent for the purposes of the Contract as substitute for the Employer's Agent so named. In terms of this Contract the term "Employers Agent" will mean to be "Engineer" and vice versa.
- 1.1.1.14 "Due Completion Date" means the date or dates of the expiry of the time stated in the Contract Data for achieving Practical Completion for the whole or portions of the Works, calculated from the Commencement Date and as adjusted by such extensions of time or acceleration as may be allowed or agreed in terms of Contract.
- 1.1.1.20 "Form of Offer and Acceptance" means the document defined as the Contract Agreement that formalises the legal process of offer and acceptance and gives rise to the Contract.
- 1.1.1.35 "parties" means the Contractor and the Employer.
- 1.1.1.36 "approved programme" means the latest programme submitted by the Contractor and approved by the Employer's Agent. The latest programme approved by the Employer's Agent supersedes previous approved programmes.

1.2 Interpretations

- 1.2.1 Any written communication between the parties shall have been duly delivered if:
 - 1.2.1.1 Handed to the addressee or to his duly authorised agent; or
 - 1.2.1.2 Delivered at the address of the addressee as stated in the Contract Data, including an e-mail address; and
 - 1.2.1.3 Any notice or claim required in accordance with this Contract shall be communicated separately from

other communications, on a separate cover with specific reference to the clause in terms of which the communication was made

Provided that the Employer, Employer's Agent and Contractor shall be entitled, by written notice to each other, to change their said addresses.

- 1.2.6 Any act or communication, including but not limited to "accept, agree, appoint, approve, certify, decide, delegate, dispute, elect, grant, inform, instruct, issue, notice, object, order, record, refuse, request, require, state, dispute, call for" and their derivatives indicate an act to be carried out in writing.

1.4 Non Variation Clause

- 1.4.1 This Contract is the entire contract between the parties regarding the matters addressed in this Contract. No representations, terms, conditions or warranties not contained in this Contract shall be binding on the parties. No agreement or addendum varying, adding to, deleting or terminating this Contract including this clause shall be effective unless reduced to writing and signed by both parties.

2.4 Ambiguity or discrepancy

- 2.4.2 If compliance with any such instruction shall result in delay to Practical Completion and/or the incurrence of proven additional cost the Contractor shall be entitled to make a claim in accordance with Clause 10.1 as read with Clause 6.3.

2.5 Assignment

- 2.5.1 Neither the Contractor nor the Employer shall, without the written consent of the other, assign the Contract or any part thereof, or any obligation under the Contract, or cede any right or benefit thereunder. Such assignment or cession shall be null and void without the other parties consent.

3.1 Qualifications of the Employer's Agent

- 3.1.1 The natural person appointed by the Employer to administer the Contract shall be a registered professional in a built environment profession that is appropriate to the Scope of Work.

3.2 Functions of the Employer's Agent

- 3.2.1 The function of the Employer's Agent is to administer the Contract in accordance with the provisions of the Contract.

4.1 Extent of obligations and liability

- 4.1.1 The Contractor shall, save insofar as it is legally or physically impossible, design (to the extent provided in the Contract Data), execute and complete the Works and obligations remedy any defects therein in accordance with the provisions of the Contract.

- 4.1.2 Where the Contract Data provides that part of the Works shall be designed by the Contractor,

4.1.2.1 the relevant part of the Works shall be fit for such purposes for which it is intended as are specified in the Contract, and

4.1.2.2 the Contractor shall, notwithstanding approval by the Employer's Agent, be liable for any error or deficiency in any drawing or document supplied by him for that part of the Works, and for any loss or damage arising out of such error or deficiency.

4.1.2.3 the Contractor shall submit to the Employer's Agent the "as-built" documents and operation and maintenance manuals in accordance with the Scope of Works and in sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair this part of the Works. Such part shall not be considered to be completed for the purposes of issuing a Certificate of Practical Completion in terms of Clause 5.14.1 as read with the relevant Contract data until these documents and manuals have been submitted to the Employer's Agent.

- 4.1.4 The Contractor indemnifies the Employer against any liability for any breach of the provisions of Clause 4.1.

4.2 Employer's Agent's instructions

4.2.3 Should the Contractor fail to proceed with due diligence with any Employer's Agent's instruction, the Employer's Agent may notify the Contractor to proceed within 7 days from receipt of such notice. Without further notice, on default by the Contractor, the Employer may employ other parties or use its own resources to give effect to such instruction in addition to any other rights that the Employer may have inter alia in terms of Clause 9.2.1.3.6. The Employer may recover such costs from the Contractor resulting from same.

4.3 Legal provisions

4.3.3 The Employer and the Contractor shall enter into an agreement 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 latest Construction Regulations promulgated thereunder.

4.12 Contractors Superintendence

4.12.2 The Contractor, or a competent and authorized agent or representative approved in writing by the Employers Agent (which approval may at any time be withdrawn in writing), hereinafter called the Construction Manager, shall be on site at all times when work is being performed, or when the Employers Agent shall, with reason, require his presence. The Construction Manager must be in possession of the following:

- a) NQF level 5 for labour intensive construction methods.
- b) Completed at least 5 projects by means of labour intensive construction.
- c) Minimum ND Civil qualification.

5.3 Commencement of the Works

5.3.1 Upon the Employer's Agent's instruction the Contractor shall, save as may be otherwise provided in the Contract or be legally or physically impossible, commence executing the Works. Such instruction shall be subject to the submission by the Contractor, and approval by the Employer, of documentation required before commencement with Works execution, as set out in the Contract Data.

5.3.3 If the Employer's Agent's instruction to commence executing the Works, or to resubmit documentation with reasons after having found to be unacceptable by the Employer, is not received by the Contractor within 7 days from the actual date of the submission of all the documentation referred to in Clause 5.3.1, commencement of the Works shall be taken to be on the expiry of such 7 days. However, deemed commencement of the Works shall not be construed as approval of the documentation submitted.

5.4 Access to Site

5.4.3 If the Contractor suffers delay to Practical Completion and/or incurs proven additional cost from failure of the Employer to give access to or possession in accordance with the terms of this Clause, the Contractor shall be entitled to make a claim in accordance with Clause 10.1, for which purpose the time limits of 28 days provided in Clause 10.1.1.1 shall commence to run only from the time when access to or possession of the Site has actually been given.

5.6 Programme

5.6.1 The Contractor shall deliver to the Employer's Agent as part the documentation required before commencement with Works execution in accordance with Clause 5.3.1, an initial programme and method statement for carrying out the Works in order to meet the Due Completion Date.

5.6.2 The initial programme and all subsequent adjusted programmes shall show and, when relevant, describe in method statements, the entire scope of the Works to be performed including but not limited to:

5.6.2.1 The Commencement Date, commencement of the Works, Due Completion Date(s) or revisions thereof, and the planned date(s) of Practical Completion for the Works as a whole or in respect of different portions of the Works.

5.6.2.8 Health and safety requirements

5.6.2.9 Critical path including the links between all predecessors and successors for activities on the critical path

5.6.3 The Employer's Agent shall, within 7 days after the Contractor has submitted an initial or adjusted programme, approve such programme or rejecting same with reasons and instruct the Contractor to amend such programme. Reasons for rejecting a programme are *inter alia* that it is not in accordance with the Contract or is not reflecting the actual progress. The Employer's Agents failure to approve or reject with reasons the submitted programme,

5.6.3.1 in the event of the submitted programme being an adjusted programme, shall be considered to be the approved programme; and

5.6.3.2 in the event of the submitted programme being an initial programme, shall not be considered to be the approved programme. However, the Contractor shall have the right to suspend the Works in terms of Clause 5.11.1.3 and if the Contractor suffers delay to Practical Completion and/or incurs proven additional cost from such suspension, the Contractor shall be entitled to make a claim in accordance with Clause 10.1.

5.6.4 The programme, method statement and the cash flow forecast shall be subject to updates and review on a monthly basis. The Contractor shall deliver to the Employer's Agent an adjusted programme reflecting actual progress and updated dates in accordance with Clause 5.6.2, even though it may reflect that the planned date(s) of Practical Completion will be later than the corresponding Due Completion Date(s), every month, and in addition;

5.6.4.1 when instructed by the Employer's Agent,

5.6.4.2 when it no longer reflects the actual progress,

5.6.4.3 when a specific event, circumstance, act or omission may delay the execution of the Works, or

5.6.4.4 with each extension of time claim

5.6.5 The submission to and approval by the Employer's Agent of any programme, method statement and/or cash flow forecast or its adjustments, or the delivery of any other relevant particulars, shall not relieve the Contractor of any of his duties or responsibilities under the Contract.

5.7 Progress of the Works

5.7.3 The Employer's Agent may request the Contractor to submit, or the Contractor may submit to the Employer's Agent, a revised programme and cost determined in accordance with Clause 6.4 for accelerating the rate of progress to achieve Practical Completion before the Due Completion Date. If accepted by the Employer, the adjusted Due Completion Date and the conditions for payment of cost shall be agreed in writing and signed by the parties.

5.9 Instructions

5.9.3 The Contractor shall give adequate written notice to the Employer's Agent of any instructions or drawings, which the Contractor may require for the execution of the Works and the Employer's Agent shall deliver such instructions and/or drawings to the Contractor. The notice shall include details of the necessary drawing or instruction, details of by when it should be issued, and details of the nature and amount of the delay likely to be suffered if it is late.

5.11 Suspension of the Works

5.11.1 The Contractor may, after giving fourteen (14) days written notice to the Employer, with a copy to the Employer's Agent, (with specific reference to this Clause) suspend the progress of the Works where the Employer has failed in terms of Clause 6.10.4 to:

5.11.1.1 Deliver a payment certificate, or

5.11.1.2 Make full payment of the amount certified in the payment certificate without prejudice to the Contractor's other rights under this Contract or by law, or

5.11.1.3 Failed to approve an initial programme in terms of Clause 5.6.3.2

5.12 Extension of the time for Practical Completion

- 5.12.1 If circumstances of any kind whatsoever which occurred be such as fairly entitle the Contractor to an extension of time and will actually delay Practical Completion of the Works beyond the Due Completion Date, the Contractor shall claim in accordance with Clause 10.1 such extension of time as is appropriate. Such extension of time shall take into account any special non-working days and all relevant circumstances, including concurrent delays or savings of time which might apply in respect of such claim and the Due Completion Date will be revised accordingly.
- 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 cumulatively for the construction period, 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 cumulative days for normal climatic conditions must be indicated on the initial programme as a single bar item/activity and as the immediate predecessor to Practical Completion and on the critical path of the programme. The normal climatic conditions will be recorded on the specific days, as and when they occur. Should the days listed below for normal climatic conditions not be used, the days, will become float in terms of Clause 5.6.2 of the GCC 2015 (3rd Edition). The float shall belong to the project and shall only be taken up on prior approval by the Employers Agent.

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	3 days
March	4 days
April	4 days
May	4 days
June	5 days
July	5 days
August	4 days
September	4 days
October	3 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.

- 5.12.2.5 Any delay, impediment, or prevention caused by or attributable to the Employer, Employer's Agent, the Employer's personnel or the Employer's other contractor's on the Site.
- 5.12.4 Instead of granting extension of time, if feasible, the Employer's Agent may request the Contractor to accelerate the rate of progress to achieve Practical Completion without extension of time and agree the cost for payment of such acceleration in accordance with Clause 5.7.3.

5.13 Penalties for delay

- 5.13.2.1 Refer to 1.2.2 Contract specific data.

5.14 Completion

- 5.14.1 Save as otherwise provided in the Contract, the Contractor shall be entitled to receive a Certificate of Practical Completion when the Works have reached Practical Completion.

When the Works are about to reach the said stage, the Contractor shall, in writing, request a Certificate of Practical Completion and the Employer's Agent shall, within 14 days after receiving such request, either where the Works;

- 5.14.1.1 has reached Practical Completion issue a Certificate of Practical Completion to the Contractor and to the Employer or
- 5.14.1.2 has not reached Practical Completion, issue a written list to the Contractor defining the incomplete work and defects to be rectified to achieve Practical Completion.

Should the Employer's Agent not issue a Certificate of Practical Completion or such a list within the 14 days, Practical Completion shall be considered to have been achieved on the expiry of the 14 days of the written request in terms of Clause 5.14.1.

- 5.14.2 As soon as the work referred to in the list issued in terms of Clause 5.14.1 has been duly completed and defects that manifested after the list was issued rectified, the Employer's Agent shall deliver to the Contractor and to the Employer a Certificate of Practical Completion together with a further written list setting out the work to be completed to justify the issuing of a Certificate of Completion.
- 5.14.6 The Employer need not occupy the Works before the Due Completion Date
- 5.14.7 If, in terms of the Contract Data stated for Clause 1.1.1.14, different times for achieving Practical Completion are specified in respect of different portions of the Works, the provisions for the Works as a whole shall apply with necessary adjustment in respect of such portions.

6.2 Security

- 6.2.1 The Contractor shall deliver to the Employer, as part of the documentation required before commencement with Works execution in accordance with Clause 5.3.1, at his cost, the type of security for the due performance of the Contract, as selected in the Contract Data.
- 6.2.2 If the Contractor fails to provide or maintain the security as selected in the Contract Data within the time period stated in Clause 5.3.2 or if the performance guarantee is not in accordance with the relevant pro forma performance guarantee, the Employer, in his sole discretion, may either
 - 6.2.2.1 Hand over the Site to the Contractor and withhold payment from the Contractor until the amount withheld is equal to ten per cent (10%) of the Contract Price. Such amount shall be reduced to five per cent (5%) of the Contract Price when the Employer's Agent has issued a Certificate of Completion [5.14.4] and to zero per cent (0%) in the Final Payment Certificate [6.10.9] or
 - 6.2.2.2 Terminate this Contract in terms of Clause 5.3.2 as read with Clause 9.2.1.3.2.
- 6.2.3 If the Contractor is to provide a performance guarantee as security, he shall ensure that it remains valid and enforceable until the Final Approval Certificate is issued. The performance guarantee shall specify an expiry date, and if the Contractor has not become entitled to receive the Final Approval Certificate of the Works by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the performance guarantee until such time that work have been completed and any defects have been remedied.

6.7 Measurement of the Works

- 6.7.3.1 The Construction Manager identified in terms of Clause 4.12.2 will attend to assist the Employer's Agent in making such measurement, or to make such measurement in the presence of the Employer's Agent. Should the Construction Manager fail to attend, Clause 6.7.4.2 will apply.

6.8 Adjustment in rates and/or prices

- 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 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 eleventh 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.

6.10 Payment

6.10.1 With regard to all amounts that become due to the Contractor in respect of the matters set out in Clauses 6.10.1.1, 6.10.1.2, 6.10.1.3, 6.10.1.4, and 6.10.1.5 below, the Contractor shall deliver to the Employer's Agent a monthly statement for payment of all amounts he considers to be due to him (in such form and on such date as may be agreed between the Contractor and the Employer's Agent, or failing agreement, as the Employer's Agent may require) and the Employer's Agent shall, by signed payment certificates issued to the Employer and the Contractor, certify the amount he considers to be due to the Contractor or the Employer, taking into account the following:

6.10.1.5 The value up to the percentage limit stated in the Contract Data of Plant and materials referred to in Clause 6.9.1 not yet built into the Permanent Works. No payment will be made for any Plant and/or materials off site, except if expressly agreed otherwise;

Provided that the Contractor has produced documentary evidence of ownership of such Plant and/or materials and has delivered to the Employer an indemnity, approved in writing by the Employer, against any claim to or in respect of such Plant and/or materials by reason of the Contractor's sequestration or liquidation, or of any defect in the Contractor's title to the Plant and/or materials.

6.10.4 The Employer's Agent shall deliver to the Employer and the Contractor the payment certificate referred to in Clause 6.10.1 within 7 days of the receipt by the Employer's Agent of the Contractor's said statement. The Employer's Agent shall not be relieved from its responsibility to issue a payment certificate whether or not the Contractor submits the said statement. Any dissatisfaction in respect of such payment certificate shall be dealt with in terms of Clause 10.2. The Employer or the Contractor, as the case may be, shall pay the amount due to the other within 28 days of receipt by the Employer and the Contractor of the payment certificate signed by the Employer's Agent. Payment shall be subject to the Contractor or the Employer, as the case may be, submitting a tax invoice, if required by law, to the other party for the amount due.

6.10.8 Within 14 days of the date of the Certificate of Completion, the Contractor shall deliver to the

Employer's Agent a completion statement showing the value of work done in respect of which a Certificate of Completion has been issued and shall supply such further information as the Employer's Agent may reasonably require. The Contractor shall not be entitled to any payment in respect of any matter which has not been included in such completion statement save as provided for in Clauses 5.14, 7.7 and 7.8 in respect of work executed during the Defects Liability Period and/or Clauses 10.3 to 10.11 in respect of any dispute. The Employer's Agent shall deliver to the Employer and the Contractor the payment certificate in respect of the completion referred to above within 14 days of the receipt by the Employer's Agent of the Contractor's said statement, and the Employer or the Contractor, as the case may be, shall pay the amount due to the other party within 28 days after receipt by the Employer and the Contractor of the payment certificate signed by the Employer's Agent.

- 6.10.9 Within 14 days of the date of final approval as stated in the Final Approval Certificate, the Contractor shall deliver to the Employer's Agent a final statement claiming final settlement of all moneys due to him (save in respect of matters in dispute, in terms of Clauses 10.3 to 10.11, and not yet resolved). The Employer's Agent shall within 14 days issue to the Employer and the Contractor a Final Payment Certificate, the amount of which shall be paid to the Contractor or the Employer, as the case may be, within 28 days of the date of such certificate, after which no further payments shall be due to the Contractor (save in respect of matters in dispute, in terms of Clauses 10.3 to 10.11 and not yet resolved).

8.6 Insurances

- 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.

9.2 Termination by Employer

- 9.2.1.3.2 Has failed, in terms of Clause 5.3.2, to submit documentation in time, or to submit acceptable documentation, or to maintain and extend the validity of the performance guarantee until the Certificate of Completion; or
- 9.2.1.3.6 Is not executing the Works in accordance with the Contract, or is neglecting or failing to carry out his obligations under the Contract, *inter alia* to comply with any instruction under Clause 4.2; or

10.1 Contractor's Claim

- 10.1.1 The following provisions shall apply to any claim by the Contractor for an extension of time for Practical Completion of the Works in terms of Clause 5.12, or in terms of any Clause that refers to Clause 10.1 for additional payment or compensation:
- 10.1.1.1 The Contractor shall within 28 days after the commencement of each circumstance, event, act or omission giving rise to such a claim, deliver to the Employer's Agent a written claim, referring to this

Clause and setting out:

- 10.1.1.1.1 The particulars of the circumstance, event, act or omission giving rise to the claim concerned,
 - 10.1.1.1.2 The provisions of the Contract on which he bases the claim
 - 10.1.1.1.3 The length of the extension of time, if any, claimed and the basis of the calculation by incorporating the effects of each circumstance, event, act or omission on the critical path of an Approved Programme, indicating the delay on Practical Completion, and
 - 10.1.1.1.4 The amount of money claimed and the basis of calculation thereof.
- 10.1.1.2 If, by reason of the nature and circumstances of the claim, the Contractor cannot reasonably comply with all or any of the provisions of Clause 10.1.1.1.1 to 10.1.1.1.4 to deliver a claim within the said period of 28 days, he shall:
- 10.1.1.2.1 within the said period of 28 days issue a further notice referring to the relevant notice in terms of Clause 10.1.2 and confirming his intention to make the claim and comply with such of the requirements of Clause 10.1.1.1.1 to 10.1.1.1.4 as he reasonably can, and
 - 10.1.1.2.2 As soon as practicable, comply with such of the requirements of Clause 10.1.1.1.1 to 10.1.1.1.4 as have not yet been complied with.
- 10.1.1.3 If the circumstance, event, act or omission relating to the claim are of an ongoing nature:
- 10.1.1.3.1 the Contractor shall, within 14 days after the commencement of each circumstance, event, act or omission giving rise to such a claim, deliver to the Employer's Agent a written notice of his intention to submit a claim, referring to this Clause and setting out the particulars of the circumstance, event, act or omission. Provided that the additional payment or compensation or delay that occurred before 14 days prior the date on which the notice in terms of this clause was delivered, shall be deemed to be covered by the rates and/or prices set out in the Pricing Data and the time stated in the Contract Data relating to Clause 5.5.1
 - 10.1.1.3.2 The Contractor shall, in addition to delivering the said further notice within 28 days in terms of Clause 10.1.1.2.1, each month deliver to the Employer's Agent, in writing, updated particulars required in terms of Clause 10.1.1.1.1 to 10.1.1.1.4 and, within 28 days after the end of the circumstance, event, act or omission deliver his final claim.
- 10.1.2 The Contractor shall issue an early warning notifying to the Employer's Agent as soon as he becomes aware of any circumstance, event, act or omission which could:
- 10.1.2.1 Increase the Contract Prices,
 - 10.1.2.2 Delay Practical Completion, or
 - 10.1.2.3 Impact on the quality or
 - 10.1.2.4 Impair the performance of the Works in use
- 10.1.3.6 The Employer, the Employer's Agent and the Contractor shall not in any proceedings in accordance with Clauses 10.3 to 10.11 be entitled to give or lead evidence of or rely on any fact or circumstance not recorded in terms of this Clause.
- 10.1.4 If, in respect of any claim to which this Clause refers, the Contractor fails to deliver his claim within the 28 day claim period in terms of Clause 10.1.1.1 or does not deliver a further notice within the period of 28 days in terms of Clause 10.1.1.2.1 or does not deliver his final claim within 28 days after the circumstance, event, act or omission ceased in terms of Clause 10.1.1.3.2, the Due Completion Date shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged all liability in connection with the claim.
- Provided that failure by the Contractor to give an early warning notice in terms of Clause 10.1.2 which an experienced Contractor could have given, the claim shall be assessed by the Employer's Agent and the ruling in terms of Clause 10.1.5 shall be taken into account the lack of mitigation measures employed due the lack of such early warning notice.
- 10.1.5 Unless otherwise provided in the Contract, the Employer's Agent shall within 28 days after the Contractor has delivered his claim in terms of Clause 10.1.1, give effect to Clause 3.1.2 and deliver to the Contractor and the Employer his written and adequately reasoned ruling on the claim referring specifically to this Clause. The amount thereof, if any, allowed by the Employer's Agent shall be

included to the credit of the Contractor the next payment certificate. Where the Employer's Agent fails to make a ruling within such 28 days the claim shall be deemed to be refused;

Provided that:

- 10.1.5.1 The said period of 28 days may be extended if so agreed between the Contractor and the Employer's Agent prior to the expiry of such 28 days, and
- 10.1.5.2 Any amount that has been established to the satisfaction of the Employer's Agent, before his ruling on the whole claim, shall be included to the credit of the Contractor in the next payment certificate.
- 10.3.1 Any dispute of whatsoever nature arising out of this Contract concerning any of the rights and/or obligations of any party thereto, either during the currency of the Contract or after the completion thereof, including any dispute as to the validity of the Contract, shall be referred to adjudication in terms of Clause 10.5. The Contractor or the Employer, hereinafter referred to as "the parties", may deliver to the other a written notice, hereinafter referred to as a "Dispute Notice", of any dispute arising out of or in connection with the Contract;
- 10.10.1 Nothing herein contained shall deprive the Contractor or the Employer of either party's right to institute immediate court proceedings in respect of failure by the Employer or the Contractor, as the case may be, to pay the amount of a payment certificate on its due date, or to pay any amount of retention money on its due date for payment.
- 10.10.3 The Adjudication Board, arbitrator and the court shall have full power to open up, review and revise any ruling, decision, order, instruction, certificate or valuation of the Employer's Agent. The Arbitrator and the court shall have full power to and to reconsider any decision by the Adjudication Board relevant to the matter in dispute, and neither party shall be limited in such proceedings before such arbitrator or court to the evidence or arguments put before the Employer's Agent for the purpose of obtaining his ruling, or the Adjudication Board for the purpose of obtaining a decision.

1.2.2 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:

	<u>CL NO</u>	
DEFECTS LIABILITY PERIOD	1.1.1.13	12 CALENDAR MONTHS
TIME FOR ACHIEVING PRACTICAL COMPLETION	1.1.1.14	MAXIMUM 10 MONTHS – INCLUSIVE OF THE 14 DAY PERIOD REFERRED TO IN CLAUSE 5.3.2 AND INCLUSIVE OF NON-WORKING DAYS REFERRED TO IN CLAUSE 5.8.1, BUT EXCLUSIVE OF SPECIAL NON-WORKING DAYS.
NAME OF EMPLOYER	1.1.1.15	LANGEBERG MUNICIPALITY
NAME OF EMPLOYERS AGENT	1.1.1.16	INVICTUS ENGINEERING SERVICES (PTY) LTD – FRANCOIS RYKE
ADDRESS AND TELEPHONE NUMBER OF EMPLOYERS AGENT	1.2.1.2	5 TH FLOOR MODENA BUILDING BELLA ROSA VILLAGE BELLVILLE 021 975 1718
THE PRICING STRATEGY	1.1.1.26	RE-MEASUREMENT CONTRACT
HEALTH AND SAFETY PLAN	5.3.1	WITHIN 14 DAYS AFTER COMMENCEMENT DATE
INITIAL PROGRAMME	5.3.1	WITHIN 14 DAYS AFTER COMMENCEMENT DATE

THE AGREEMENT IN TERMS OF THE PROVISIONS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT (NO. 85 OF 1993) AND THE CONSTRUCTION REGULATIONS PROMULGATED THERE UNDER MUST BE SIGNED	5.3.1	WITHIN 14 DAYS AFTER COMMENCEMENT DATE
TIME WITHIN WHICH PERFORMANCE GUARANTEE (SECURITY) MUST BE PROVIDED	5.3.1	WITHIN 14 DAYS AFTER COMMENCEMENT DATE
TIME WITHIN WHICH INSURANCE MUST BE PROVIDED	5.3.1	WITHIN 14 DAYS AFTER COMMENCEMENT DATE
LETTER OF GOOD STANDING FROM THE COMPENSATION COMMISSIONER	5.3.1	WITHIN 14 DAYS AFTER COMMENCEMENT DATE
TIME TO SUBMIT DOCUMENTATION BEFORE COMMENCEMENT OF THE WORKS IS	5.3.2	14 DAYS
NON-WORKING DAYS	5.8.1	The special non-working days are: (1) All gazetted public holidays falling outside the year end break. (2) The year end break commencing as published by SAFCEC The following conditions apply: a) No work allowed after 18:00 on weekdays. b) Working times for Saturdays are 08:00 - 14:00. c) No work allowed on Sundays, Public Holidays and year end break as published by SAFCEC. d) Approval for work outside of normal working hours to be obtained from Employer. PENALTY FOR THE TRANSGRESSION OF ABOVE CONDITIONS IS R5 000 / TRANSGRESSION.
SPECIAL NON-WORKING HOURS/DAYS	5.8.1	THE SAFCEC PUBLISHED INDUSTRY SHUTDOWN PERIOD IN DECEMBER AND JANUARY. ALL STATUTORY PUBLIC HOLIDAYS.
AMOUNT OF PENALTY FOR DELAY	5.13.1	R 5 000 PER DAY
THE REQUIREMENTS FOR ACHIEVING PRACTICAL COMPLETIONS ARE	5.14.1	ALL PAYMENT ITEMS IN THE BILL OF QUANTITIES MUST BE INCORPORATED INTO THE WORKS OR AS DETERMINED BY THE EMPLOYER'S AGENT.
LATENT DEFECT PERIOD BEYOND THE DATE OF FINAL APPROVAL CERTIFICATE	5.16.3	10 YEARS
THE SECURITY PROVIDED BY THE CONTRACTOR	6.2.1	PERFORMANCE GUARANTEE OF 10% OF THE CONTRACT SUM PLUS Retention of 10% of the value of the Works
THE PERCENTAGE ALLOWANCE ON THE NET COST OF MATERIALS ACTUALLY USED IN THE COMPLETED WORKS IS	6.5.1.2.3	5%
PERCENTAGE ADVANCE ON MATERIALS NOT YET BUILT INTO THE PERMANENT WORKS IS	6.10.1.5	80% OF VALUE OF MATERIALS ON SITE OR VALUE OF THE MOS GUARANTEE SUBMITTED AND APPROVED, WHICHEVER IS THE LESSER AMOUNT.

		Proof of payment for material must be submitted (before the MOS will be certified) of alternative a MOS guarantee may be provided (at the Contractors cost).
LIMIT OF RETENTION MONEY	6.10.3	TEN PERCENT (10%) OF THE CONTRACT SUM
THE VALUE OF PLANT AND MATERIALS SUPPLIED BY THE EMPLOYER TO BE INCLUDED IN THE INSURANCE SUM IS	8.6.1.1.2	NOT REQUIRED
THE AMOUNT TO COVER PROFESSIONAL FEES FOR THE REPAIRING DAMAGE AND LOSS TO BE INCLUDED IN THE INSURANCE SUM	8.6.1.1.3	15% OF THE CONTRACT SUM
LIMIT OF INDEMNITY OR LIABILITY INSURANCE REQUIRED	8.6.1.3	R 10 000 000-00 FOR ANY SINGLE CLAIM AND THE NUMBER OF CLAIMS TO BE UNLIMITED DURING THE CONSTRUCTION DEFECTS LIABILITY PERIOD
DISPUTE RESOLUTION	10.5.1	AD HOC ADJUDICATION
THE NUMBER OF ADJUDICATION BOARD MEMBERS TO BE APPOINTED IS	10.5.3	ONE

LANEGERG MUNICIPALITY

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BREDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

C1.2 Contract Data (Part 2)

Data provided by the Contractor

The name of the Contractor is

The address of the Contractor is

Physical:

.....

.....

.....

Postal:

.....

.....

.....

Telephone:

Fax:

Email:

CONTRACTOR'S ANNUAL BUILDERS HOLIDAY PERIOD DURING CONSTRUCTION PERIOD

Year 1 contractor's annual holiday period	Start date		End date
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LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

C1.3 Form of Performance Guarantee

PERFORMANCE GUARANTEE

For use with the Conditions of Contract as described in C1.2: Contract Data Part 1: Contract Data provided by the Employer

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means:

"Physical address:

"Employer" means: The Langeberg Municipality, DIRECTORATE.

"Contractor" means:

"Employer's Agent" means: Langeberg Municipality

"Works" means: "T13/2025": BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

"Site" means: The site as defined in the Contract Data.

"Contract" means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contract as may be agreed in writing between the parties.

"Contract Sum" means: The accepted amount inclusive of tax of R

Amount in words:

"Guaranteed Sum" means: The maximum aggregate amount of R

Amount in words:

"Expiry Date" means: The date of issue by the Employer's Agent of the Certificate of Completion of the Works.

CONTRACT DETAILS

Employer's Agent issues: Interim Payment Certificates, Final Payment Certificate and the Certificate of Completion of the Works as defined in the Contract.

PERFORMANCE GUARANTEE

1. The Guarantor's liability shall be limited to the amount of the Guaranteed Sum.
2. The Guarantor's period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of payment in full of the Guaranteed Sum, whichever occurs first. The Employer's Agent and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.

3. The Guarantor hereby acknowledges that:
 - 3.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;
 - 3.2 its obligation under this Performance Guarantee is restricted to the payment of money.
4. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:
 - 4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Employer's Agent in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;
 - 4.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;
 - 4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 4.
5. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:
 - 5.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or
 - 5.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 5; and
 - 5.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.
6. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.
7. Where the Guarantor has made payment in terms of 5, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.
8. Payment by the Guarantor in terms of 4 or 5 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
9. The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
10. The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
11. This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where

after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.

12. This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.
13. Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at

Date

Guarantor's signatory (1)

Capacity

Guarantor's signatory (2)

Capacity

Witness signatory (1)

Witness signatory (2)

ANNEXURE

LIST OF APPROVED FINANCIAL INSTITUTIONS

The following financial institutions are currently (as at 18 October 2016) approved for issue of contract guarantees to the LANGEBERG Municipality:

National Banks:

ABSA Bank Ltd.
FirstRand Bank Ltd.
Investec Bank Ltd.
Nedbank Ltd.
Standard Bank of SA Ltd.

International Banks (with branches in SA):

Barclays Bank plc.
Citibank n.a.
Credit Agricole Corporate and Investment Bank
HSBC Bank plc.
JP Morgan Chase Bank
Societe Generale
Standard Chartered Bank

Insurance companies:

ABSA Insurance
Coface s.a.
Compass Insurance Co.
Constantia Insurance Co.
Credit Guarantee Insurance Co.
Guardrisk Insurance Co.
Hollard Insurance Company Ltd.
Infiniti Insurance Limited
Lombard Insurance
New National Assurance Co.
Regent Insurance Co.
Renasia Insurance Company Ltd.
Santam Limited
Zurich Insurance Co.

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

C1.4 Form of Advance Payment Guarantee

ADVANCE PAYMENT GUARANTEE

For use with the Conditions of Contract as described in C1.2: Contract Data Part 1: Contract Data provided by the Employer

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means:

"Physical address:

"Employer" means: The Langeberg Municipality, DIRECTORATE.

"Contractor" means:

"Employer's Agent" means: Manager: Project Management, Langeberg Municipality

"Works" means: TENDER NO. "T13/2025": BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

"Site" means: The site as defined in the Contract Data.

"Contract" means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contract as may be agreed in writing between the parties.

"Plant and materials" means: The Plant and materials stored at places other than the Site, or in respect of which an advance payment prior to manufacture is required, which the Employer has agreed may be subject to advance payment, such Plant and materials being listed in the Schedule of Plant and materials.

"Schedule of Plant and materials" means: A list of Plant and materials which shows the value thereof to be included in the Guaranteed Advance Payment Sum.

"Guaranteed Advance Payment Sum" means: The maximum aggregate amount of R

Amount in words:

"Expiry Date" means: The date of the payment certificate wherein the Plant and materials have been certified by the Employer's Agent as having been built into the Permanent Works.

CONTRACT DETAILS

Employer's Agent issues: Interim Payment Certificates and Final Payment Certificate.

ADVANCE PAYMENT GUARANTEE

1. The Guarantor's liability shall be limited to the amount of the Guaranteed Advance Payment Sum.

2. The Guarantor's period of liability shall be from and including the date of issue of this Advance Payment Guarantee and up to and including the Expiry Date or the date of payment in full of the Guaranteed Advanced Payment Sum, whichever occurs first.
3. The Guarantor hereby acknowledges that:
 - 3.1 any reference in this Advance Payment Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;
 - 3.2 its obligation under this Advance Payment Guarantee is restricted to the payment of money.
4. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:
 - 4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Employer's Agent in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;
 - 4.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) calendar days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;
 - 4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 4.
5. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Advance Payment Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Advance Payment Guarantee, such demand stating that:
 - 5.1 the Contract has been terminated due to the Contractor's default and that this Advance Payment Guarantee is called up in terms of 5; or
 - 5.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Advance Payment Guarantee is called up in terms of 5; and
 - 5.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.
6. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.
7. Payment by the Guarantor in terms of 4 or 5 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
9. The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Advance Payment Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
10. The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
11. This Advance Payment Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be

returned to the Guarantor after it has expired.

12. This Advance Payment Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.
13. Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at

Date

Guarantor's signatory (1)

Capacity

Guarantor's signatory (2)

Capacity

Witness signatory (1)

Witness signatory (2)

.

Schedule of Plant and materials

For use with Advance Payment Guarantees on contracts using the General Conditions of Contract for Construction Works, Third Edition, 2015.

Employer The Langeberg Municipality, DIRECTORATE

Contractor

Works Contract No. and Title.....

Payment Certificate

Advance payment is requested in respect of the following items of Plant and materials, which have been manufactured and are stored at places other than the Site, or in respect of which a deposit with order is required from the Contractor by a manufacturer/supplier:

Bill of Quantities item no.	Description of Plant and materials	Deposit with order required (Y/N)	Place of storage (or manufacture, if deposit with order is required)	Unit	Quantity	Unit price R c	Total Price R c
Total Value of Plant and materials to be included in Guaranteed Advance Payment Sum							R

Signed at on the day of 20.....

.....
for the Contractor

.....
As witness

.....
Approved by Employer's Agent

LANEGERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

C1.5 Occupational Health and Safety Agreement

**AGREEMENT MADE AND ENTERED INTO BETWEEN THE LANEGERG MUNICIPALITY
(HEREINAFTER CALLED THE "EMPLOYER") AND**

.....,
(Contractor/Mandatarv/Company/CC Name)

**IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, 85 OF 1993 AS
AMENDED.**

I,,
representing

....., as
an employer in its own right, do hereby undertake to ensure, as far as is reasonably practicable, that all work
will be performed, and all construction equipment, machinery or plant used in such a manner as to comply
with the provisions of the Occupational Health and Safety Act (OHSA) and the Regulations promulgated
thereunder.

I furthermore confirm that I am/we are registered with the Compensation Commissioner and that all
registration and assessment monies due to the Compensation Commissioner have been fully paid or that I/We
are insured with an approved licensed compensation insurer.

COID ACT Registration Number:

.....

OR Compensation Insurer: Policy No.:

.....

I undertake to appoint, where required, suitable competent persons, in writing, in terms of the requirements of
OHSA and the Regulations and to charge him/them with the duty of ensuring that the provisions of OHSA and
Regulations as well as the Council's Special Conditions of Contract, Way Leave, Lock-Out and Work Permit
Procedures are adhered to as far as reasonably practicable.

I further undertake to ensure that any subcontractors employed by me will enter into an occupational health
and safety agreement separately, and that such subcontractors comply with the conditions set.

I hereby declare that I have read and understand the Occupational Health and Safety Specifications contained
in this tender and undertake to comply therewith at all times.

I hereby also undertake to comply with the Occupational Health and Safety Specification and Plan submitted
and approved in terms thereof.

Signed aton the.....day
of.....20.....

Mandatory

Witness

Signed aton the.....day
of.....20.....

For and on behalf of **Langeberg Municipality**

Witness

LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

C1.6 Insurance Broker's Warranty

Pro Forma



Letterhead of Contractor's Insurance Broker

Date

LANGEBERG MUNICIPALITY
Municipal Manager
PRIVATE BAG X2
ASHTON
6715
TEL: 023 626 8200

Dear Sir

CONTRACT NO.: T13/2025

CONTRACT TITLE: BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

NAME OF CONTRACTOR:

I, the undersigned, do hereby confirm and warrant that all the insurances required in terms of the abovementioned contract have been issued and/or in the case of blanket/umbrella policies, have been endorsed to reflect the interests of the LANGEBERG MUNICIPALITY with regard to the abovementioned contract, and that all the insurances and endorsements, etc., are all in accordance with the requirements of the contract.

I furthermore confirm that all premiums in the above regard have been paid.

Yours faithfully

Signed: _____

For: _____

LANEGERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

Part C2: Pricing Data

Part C2: Pricing Data 120

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LANGEBERG MUNICIPALITY

TENDER NO. T13/2025

BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON

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 SANS 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 measurement and payment clauses in a specification in which further information regarding the scheduled items is given, are referenced under "Item" (pay items) in the Bills of Quantities. The referenced clauses 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 digits which follow SANS in the SANS 1200 series of specifications, e.g. G for SANS 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 Employer's Agent 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.
7. A price or rate should be entered against each item in the Bills of Quantities, whether the quantities are stated or not. **An item against which no rate is/are entered, or if anything other than a rate or a nil rate (for example, a zero, a dash or the word "included" or abbreviations thereof) is entered against an item, it will also be regarded as a nil rate having been entered against that item, i.e. that there is no charge for that item.** The Tenderer may be requested to clarify nil rates, or items regarded as having nil rates; and the Employer may also perform a risk analysis with regard to the reasonableness of such rates.
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. The Tenderer shall fill in rates for all items where the words “rate only” appear in the “Total” column. “Rate Only” items have been included where:
- (a) an alternative item or material is contemplated;
 - (b) variations of specified components in the make-up of a pay item may be expected; and
 - (c) no work under the item is foreseen at the tender stage but the possibility that such work may be required is not excluded.

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

10. Where Provisional sums or Prime Cost sums are provided for items in the Bill of Quantities, payment for the work done under such items will be made in accordance with the Contract Specifications. The Purchaser reserves the right, during the execution of the works, to adjust the stated amounts upwards or downwards according to the work actually done under the item, or the item may be omitted altogether, without affecting the validity of the Contract.

The Tenderer shall not under any circumstance whatsoever delete or amend any of the sums inserted in the “Amount” column of the Bill of Quantities and in the Summary of the Bill of Quantities unless ordered or authorized in writing by the Purchaser before closure of tenders. Unauthorized changes made by the Tenderer to provisional items in the Bill of Quantities, or to the stated provisional percentages and sums in the Summary of the Bill of Quantities, will not be tolerated.

11. Arithmetical errors found in the Bill of Quantities as a result of faulty multiplication or addition, will be corrected by the Purchaser’s Agent at the tender evaluation stage, as set out in the Condition of Tender and the Tender Data
12. Incorrect entries shall not be erased or obliterated with correction fluid but must be crossed out neatly. The correct figures must be entered above or adjacent to the deleted entry, and the alteration must be initialled by the Tenderer.
13. 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	=	meganewton
m ³	= cubic metre	MN.m	=	meganewton-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

14. **Where fractions of a cent occur in calculations of prices and amounts, they shall be rounded up/down to the nearest whole cent.**
15. The Tenderer is referred to C.2.24 in Part T1.2 Tender Data regarding the pricing of Deviations and/or Qualifications.
16. All descriptions or clauses where trade names or proprietary products are specified, are deemed to include the phrase “or equal approved”
17. Tenderers are referred to Clause 6.8.2 in Part C1.2 Contract Data regarding contract price adjustment.

The following bills in Part C2.2 Bills of Quantities are deemed applicable to the following categories for the purposes of Contract Price Adjustment:

NO.	BILL	CPA CATEGORY
1.	NONE	

C2.2 Bills of Quantities

Bid specifications may not make any reference to any particular trade mark, name, patent, design, type, specific origin or producer, unless there is no other sufficiently precise or intelligible way of describing the characteristics of the work, in which case such reference must be accompanied by the words "or equivalent".

TENDERERS MUST NOTE THAT WHEREVER THIS DOCUMENT REFERS TO ANY PARTICULAR TRADE MARK, NAME, PATENT, DESIGN, TYPE, SPECIFIC ORIGIN OR PRODUCER, SUCH REFERENCE SHALL BE DEEMED TO BE ACCOMPANIED BY THE WORDS 'OR EQUIVALENT'

C2.2: Day Work Schedule

C2.2.1 GENERAL

Tenderers must complete this list which shall be used for the assessment of value of the work which the Engineer instructed in writing that must be done on a day work bases, all in agreement with Clause 6.5 of the General Conditions of Contract for Construction Works 2015. All the rates are fixed and shall be binding until and with the issuing of the final approval certificate, except for statutory increases announced from time to time, only if this Contract is subject to contract price adjustment as specified in Clause 6.8.2 of the Contract Data.

C2.2.2 LABOUR COSTS

Rates for labour as listed below shall include all the allowances as specified in the General Conditions of Contract for Construction Works 2015. If these rates differs from similar rates tendered in the bill of quantities, the rates in the tendered bill of quantities will apply.

Overtime costs attached to this contract shall be paid in the same relation as to that which the employees are actually paid.

Only the net working hours will be measured under dayworks and it will be held that the Contractor has made provision in his rates for possible interruptions and standing time.

DESCRIPTION	UNIT	RATE
Unskilled Labourer	hour	
Semi-skilled Labourer	hour	
Skilled Labourer	hour	
Pipe Layer	hour	
Bricklayer	hour	
Steel Fixer	hour	
Foreman/Section Leader	hour	
General Foreman	hour	
Surveyor	hour	

- * Where there are discrepancies in the rates tendered for similar items in the above table and items listed in the bill of quantities, the rates in the bill of quantities shall govern.
- * All labour not specified above and not listed additionally by the Contractor, will be regarded as "Skilled Labour".

C2.2.3 EQUIPMENT COSTS

Full comprehensive hourly rates, which also include the cost of the operators and other equipment, must be listed below. Rates must also include all the costs of consumable items, maintenance, depreciation, tools and all other coincidences that shall be necessary to operate the equipment for the purpose it is designed for. If these rates differs from similar rates tendered in the bill of quantities, the rates in the tendered bill of quantities will apply.

The rates must also include all the overhead costs, profits, site supervision, insurance, holidays with payment, travelling costs (or travelling allowances) and residence allowances of operators and any other allowances that is applicable. No further percentage allowances shall be applicable on equipment. The Tenderer must list under each heading the fabrication and specification of the equipment available.

The Contractor will be paid the actual net cost of plant hired by him for dayworks and in addition will be paid a percentage allowance on the net cost of such hire which allowance will cover the

Contractors overhead costs and profit.

DESCRIPTION	UNIT	RATE
1. Digger-Loader (TLB)		
	hour	
	hour	
2. Excavators		
	hour	
	hour	
3. Trucks (m ³ specified)		
	hour	
	hour	
4. Water trucks (litres specified)		
	hour	
	hour	
5. Tractors and trailers		
	hour	
	hour	
6. Concrete mixers (litres specified)		
	hour	
	hour	
7. Water pumps		
75 mm	hour	
100 mm	hour	
150 mm	hour	
8. Plate compactors		
	hour	
	hour	
9. Rammer / Jumping Jack Compactors		
	hour	
	hour	
10. Breakers / Jack Hammers		
	hour	
	hour	
11. Compressors		
	hour	
	hour	
12. Drills (electrical or battery operated)		
	hour	
	hour	

DESCRIPTION	UNIT	RATE
13. Generators		
	hour	
	hour	
14. Other equipment (specify)		
	hour	
	hour	
	hour	
	hour	

* Where there are discrepancies in the rates tendered for similar items in the above table and items listed in the bill of quantities, the rates in the bill of quantities shall govern.

C2.3 Bill of Quantities

	<u>Page</u>
BILL OF QUANTITIES	130
SUMMARY	131
DECLARATION	132

Notes:

Tenderers must complete the Bill of Quantities in black ink.

Tenderers attention is drawn to the Pricing Instructions.

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
	SANS 1200 A	<u>SCHEDULE A: PRELIMINARY AND GENERAL</u>				
A.1	8,3	FIXED-CHARGED ITEMS				
A.1.1	8.3.1	Contractual Requirements	Sum	1		
	8.3.2	Establish Facilities on the site				
	8.3.2.1	Facilities for Engineer				
A.1.2		a) Nameboard	No.	1		
	8.3.2.2	Facilities for Contractor				
A.1.3		(a) Offices and Storage sheds	Sum	1		
A.1.4		(b) Workshops	Sum	1		
A.1.5		(d) Living accommodation	Sum	1		
A.1.6		(e) Ablution and latrine facilities	Sum	1		
A.1.7		(f) Tools and Equipment	Sum	1		
A.1.8		(g) Water supplies, Electrical power, Communication facilities	Sum	1		
A.1.9	8.3.3	Other fixed-charge obligations(Specify)	Sum	1		
A.1.10	8.3.4	Removal of site establishment on completion of works	Sum	1		
A.1.11		Health and Safety Plan: Submit for approval (See Part C.5)	Sum	1		
A.2	8,4	TIME-RELATED ITEMS				
A.2.1	8.4.1	Contractual requirements	Sum	1		
A.2.2	8.4.2	Operate and maintainance of facilities on site	Sum	1		
	8.4.2.1	Facilities for Engineer for duration of Contract (SANS 1200 AB)	Sum	1		
TOTAL CARRIED FORWARD						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
A.2.3		a) Nameboard	No.	1		
	8.4.2.2	Facilities for Contractor for duration of				
A.2.4		(a) Offices and Storage sheds	Sum	1		
A.2.5		(d) Living accommodation	Sum	1		
A.2.6		(e) Ablution and latrine facilities	Sum	1		
A.2.7		(f) Tools and equipment	Sum	1		
A.2.8		(g) Water supplies, Electrical power and communication facilities	Sum	1		
A.2.9	8.4.3	Supervision	Sum	1		
A.2.10	8.4.4	Company and Head office overhead costs	Sum	1		
A.2.11	8.4.5	Other time-related obligations(Specify)	Sum	1		
A.3		SUMS STATED PROVISIONALLY BY THE ENGINEER:				
	SD A 8.5(a)	For work to be done by Contractor:				
A.3.1		i) Tests by Engineer	Prov Sum	1	10 000,00	10 000,00
		ii) Employer's Health and Safety Agent	Prov Sum	1	75 000,00	75 000,00
A.4	SD A 8.7	DAYWORK				
A.4.1		Trench excavator with minimum capability of 75 kW Manufacturer:..... Model:.....	h	5		
A.4.2		Front end Loader with minimum capability of 60 kW Manufacturer:..... Model:.....	h	5		
TOTAL CARRIED FORWARD						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
A.4.3		Digger-loader with minimum capability of 50 kW Manufacturer:..... Model:.....	h	5		
A.4.4		Tip truck with minimum capacity of 6m3 Manufacturer:..... Model:.....	h	5		
A.4.5		Grader with minimum capability of 150kW Manufacturer:..... Model:..... Compactors:	h	5		
A.4.6		Selfpropelled single drum vibrating compactor. Minimum mass: 19 t Minimum capability: 97 kW Manufacturer:..... Model:.....	h	5		
A.4.7		Handcontrolled double drum vibrating compactor Minimum drumwidth: 0.39 m Minimum capability: 3.7kW Manufacturer:..... Model:.....	h	5		
A.5	SD A 8.7.1	STANDING TIME COSTS				
A.5.1		Plant	day	5		
A.5.2		Labour	day	5		
A.5.3		Other resources (to be specified)	day	5		
A.5.4	SD A 8.9	Implementation and adherence to the Occupational Health and Safety Act	Sum	1		
A.5.5	SD A 8.10	Environmental Control	Sum	1		
TOTAL CARRIED FORWARD TO SUMMARY						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
	SANS 1200 C	<u>SCHEDULE B: SITE CLEARANCE</u>				
B.1		CLEAR AND GRUB				
	SD C 8.2.1	Clear and grub in :				
B.1.1		a) Pipelines (6m wide)	m	36		
B.1.2		b) Pump Station Area	m ²			
B.1.3		c) PresTank Reservoir	m ²	40		
	8.2.2	Remove and grub large trees and tree stumps of girth :				
B.1.4		a) 1m to 2m	No	3		
B.1.5		b) 2.01m to 3m	No	1		
B.1.6		c) Over 3m	No	1		
B.2		SITE PREPERATION				
	8.2.10	Remove topsoil to a nominal depth 150mm, stockpile and maintain for reuse:				
B.2.1		a) Pipelines (6m wide)	m ³	35		
B.2.2		b) Pump Station Area	m ³			
B.2.3		c) PresTank Reservoir	m ³	6		
B.3		TOPSOILING				
	SD C 8.2.12	Placing of topsoil from stockpile:				
B.3.1		a) Pipelines (6m wide)	m ³	35		
B.3.2		b) Pump Station Area	m ³			
B.3.3	SD C 8.2.14	Remove rubble and dispose of undesirable material not included in rates above	m ³	30		
TOTAL CARRIED FORWARD TO SUMMARY						

EARTHWORKS GENERAL

TOTAL CARRIED FORWARD TO SUMMARY

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
	SANS 1200 DB	<u>SCHEDULE D : EARTHWORKS PIPES</u>				
		<u>PIPELINES</u>				
D.1		EXCAVATION (PIPE TRENCHES)				
	SD DB 8.3.2 (a)	Excavate in all materials for pipe trenches, backfill, compact and dispose of surplus material:				
		For pipe diameters of 75 up to 355 mm by machine excavation				
D.1.1		i) 0,00 - 1,00 m	m			Rate Only
D.1.2		ii) 1,01 - 2,00 m	m	25		
D.1.3		iii) 2,01 - 3,00 m	m			Rate Only
D.1.4		iv) 3,01 - 4.00 m	m			Rate Only
		For pipe diameters of 355 mm up to 700 mm by machine excavation				
D.1.5		i) 0,00 - 1,00 m	m			Rate Only
D.1.6		ii) 1,01 - 2,00 m	m	25		
D.1.7		iii) 2,01 - 3,00 m	m			Rate Only
D.1.8		iv) 3,01 - 4.00 m	m			Rate Only
	SD DB 8.3.2 (b)	Extra-over Items D.1.1 to D.1.8 for excavation in:				
D.1.9		a) Hard rock excavation	m³	5		
D.1.10	SD DB 8.3.2 (c)	Excavate unsuitable material from trench bottom	m³	5		
D.2		EXISTING SERVICES				
	SD DB 8.3.5 (a)	Services that intersect a trench				
D.2.1		a) Water pipes	No	2		
	SD DB 8.3.5 (b)	Services that adjoin a trench				
D.2.2		a) Existing Pumpstation	m	12		
TOTAL CARRIED FORWARD TO SUMMARY						

CONCRETE (STRUCTURAL)

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
	SANS 1200 G	<u>SCHEDULE E : CONCRETE (STRUCTURAL)</u>				
		<u>PUMP STATION BUILDING</u>				
E.1	8.2	FORMWORK				
	8.2.2	Smooth: (Degree of Accuracy II)				
E.1.1		a) Vertical to sides of footings	m ²			Rate Only
E.1.2		b) Vertical to stairs & plinths	m ²			Rate Only
E.1.3		c) Horizontal to floor slab soffit and stairs	m ²			Rate Only
E.1.4		d) Vertical to beams	m ²			Rate Only
E.1.5		e) Horizontal to beam soffit	m ²			Rate Only
E.1.6		f) Vertical to columns	m ²			Rate Only
E.1.7		g) E/O for 25 x 25mm chamfered	m			Rate Only
		<u>PRESTANK RESERVOIR</u>				
E.2	8.2	FORMWORK				
E.2.1		h) Vertical to slab	m ²	7		
E.3	8,3	REINFORCEMENT				
	8.3.1	Steel Bars:				
E.3.1		(a) Mild Steel bars	t	0,05		
E.3.2		(b) High tensile bars	t	1,2		
E.4	8,4	CONCRETE				
	8.4.3	Strength concrete: 30 MPa/19mm:				
		<u>PUMP STATION BUILDING</u>				
E.4.1		a) Blinding (50mm)	m ³			Rate Only
E.4.2		b) Footings	m ³			Rate Only
E.4.3		c) Columns	m ³			Rate Only
E.4.4		d) Beams	m ³			Rate Only
E.4.5		e) Slab	m ³			Rate Only
TOTAL CARRIED FORWARD						

CONCRETE (STRUCTURAL)

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
E.4.6		e) Stairs	m ³			Rate Only
E.4.7		f) Plinths	m ³			Rate Only
		<u>PRESTANK RESERVOIR</u>				
E.4.8		f) Blinding (50mm)	m ³	2		
E.4.9		g) Slab	m ³	10		
	8.4.4	Unformed surface finishes:				
		a) Steel-floated finish (Degree of Accuracy II):				
		<u>PUMP STATION BUILDING</u>				
E.4.10		a) Slab	m ²			Rate Only
E.4.11		b) Plinths	m ²			Rate Only
		c) Wood-floated finish (Degree of Accuracy II):				
		<u>PUMP STATION BUILDING</u>				
E.4.12		a) Footings	m ²			Rate Only
E.4.13		b) Beams	m ²			Rate Only
E.4.14		c) Stairs	m ²			Rate Only
		<u>PRESTANK RESERVOIR</u>				
E.4.15		c) Slab	m ²	30		
E.5	SD G 8.9	SUNDRY CONCRETE ITEMS				
	SD G 8.9.6	Floor Coatings				
E.5.1		a) Mezzanine floor and Stairs painted with Abecote 337WD Primer and 2x coats of Abecote 337 from ABE	m ²			Rate Only
TOTAL CARRIED FORWARD						

CONCRETE (STRUCTURAL)

[illegible]

STRUCTURAL STEEL AND TIMBER

[illegible]

MEDIUM PRESSURE PIPELINES

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
	SANS 1200 L	<u>SCHEDULE G : MEDIUM PRESSURE PIPELINES</u>				
G.1		uPVC CLASS 6				
	SD L 8.2.1	Supply, handle, lay and bed (Class C bedding), joint as described in notes on drawing, test and disinfect pipes for:				
G.1.1		355 mm dia	m	15		
G.1.2		630 mm dia	m	25		
		Reinforced Flexible Pipe CLASS 6				
G.1.3		350 mm dia	m	20		
G.2		SPECIALS AND FITTINGS				
	8.2.2	Extra-over 8.2.1 for supply, lay, handle, bed (Class C bedding), joint, including cut pipes to lengths where required, test and disinfect for:				
		Steel Bends (Plain ended)				
G.2.1		355 mm diam x 45 deg including two Ranger couplings	No	2		
G.2.2		630 mm diam x 45 deg including two Ranger couplings	No	1		
G.2.3		630 mm diam x 90 deg including two Ranger couplings	No	1		
G.3		<u>PUMPS STATION SPECIALS AND FITTING</u>				
G.3.1	8.2.5	Supply and install all pipes, valves and specials as indicated in the pipe schedule on drawing no. 2502382/C/103 (Excl. Pumps)	Sum	1		
G.4		ANCILLARIES				
	SD L 8.2.11	Anchor/thrust blocks				
G.4.1		a) Concrete	m ³	10		
TOTAL CARRIED FORWARD						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
G.5	8.2.5	<u>VALVE CHAMBERS: PIPEWORK ONLY</u>				
G.5.1		Flowmeter Chamber to detail drawing no. 2302582/C/104	No	1		
G.5.2		Strainer Chamber to detail drawing no. 2302582/C/104	No	1		
G.6	SANS 1200 LB	BEDDING (PIPES)				
G.6.1		Provision of Bedding from commercial sources				
G.6.1.1		350 mm dia Flexible Hose	m ³	1		
G.6.1.2		355 mm dia uPVC	m ³	1.5		
G.6.1.3		630 mm dia uPVC	m ³	3.1		
G.6.2		Provision of Blanket from commercial sources				
G.6.2.1		350 mm dia Flexible Hose	m ³	5.3		
G.6.2.2		355 mm dia uPVC	m ³	8		
G.6.2.3		630 mm dia uPVC	m ³	21		
TOTAL CARRIED FORWARD TO SUMMARY						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		<u>SCHEDULE H: BUILDING WORKS</u>				
		<u>BRICKWORK: PUMP STATION BUILDING</u>				
H.1		<u>220mm LOAD BEARING WALLS</u>				
H.1.1		Exterior skin brick walls from clay semi face bricks (FBA) 14MPa min	m ²			Rate Only
H.1.2		Interior skin brick walls from ROK bricks 14MPa min	m ²			Rate Only
H.1.3		Extra over Item I.1.2 for plastering 10mm min	m ²			Rate Only
H.1.4		Brick Grip, every 4 layers, for 230mm walls	m ²			Rate Only
H.2		<u>CONCRETE LINTOLS</u>				
H.2.1		1500mm length - Box Outs	No			Rate Only
H.2.2		1800mm length - Door	No			Rate Only
H.2.3		3000mm length - Double Door	No			Rate Only
H.3	8.2.5	<u>VALVE CHAMBERS: CONCRETE AND MASONRY</u>				
H.3.1		Flowmeter Chamber to detail drawing no. 2302582/C/104	No	1		
H.3.2		Strainer Chamber to detail drawing no. 2302582/C/104	No	1		
H.4		<u>ROOF SHEETING</u>				
H.4.1		IBR roof sheeting 0.6mm thick	m ²			Rate Only
H.4.2		0.8mm thick Galvanised barge board flashing	m			Rate Only
H.4.3		228x12mm Nutec Facia Board	m			Rate Only
H.4.4		228x12mm Nutec Barge Board	m			Rate Only
H.4.5		Supply and install roof ventilation complete as per drawings. Whirley Bird or similar Model 350, rust-resistant aluminium c/w with 5 year warranty. Sealed teflon bearings and aerofoil veins with rolled edges to prevent ingress of rain or dust. C/w waterproof skirting/roof flashing included.	No			Rate Only
TOTAL CARRIED FORWARD						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
H.5		<u>DOORS</u>				
H.5.1		Aluminium Door & Frame SD 30, single leaf louvre, including Yale 3 Lever Complete Mortice Lock Set with Aluminium hinges and screws. See drawing architects drawing	No			Rate Only
H.5.2		Aluminium Door & Frame SD 30-24, double leaf louvre, including Yale 3 Lever Complete Mortice Lock Set with Aluminium hinges and screws. See drawing architects drawing	No			Rate Only
H.5.3		Extra over Item I.7.1 for galvanised steel security gate with non-exposed fixing details	No			Rate Only
H.6		<u>CEILING</u>				
H.6.1		6.4mm thick Lafarge/Gypsum or Rhino ceiling board with H-steel strips fixed to 38x38mm branderling at 450mm c/c	m ²			Rate Only
H.6.2		75mm Cove cornice from Lafarge/Gypsum/Rhino	m			Rate Only
H.6.3		Sisalation	m ²			Rate Only
H.7		<u>PAINT WORK</u>				
H.7.1		Paint work to all internal brick work, paintwork: 1 coat of Plascon Plaster Primer and two coats of Plascon Double Velvet paint (white).	m ²			Rate Only
H.7.2		Paint work to ceiling, paintwork: Plascon 1 coat for interior ceilings (pure brilliant white).	m ²			Rate Only
H.8		<u>RAINWATER</u>				
H.8.1		Marley uPVC streamline double-flo gutter	m			Rate Only
H.8.2		Gutter downpipe complete 80mm x 80mm square with specials as shown on drawing	No			Rate Only
TOTAL CARRIED FORWARD TO SUMMARY						

BEDDING (PIPES)

C2.2.144

MECHANICAL EQUIPMENT

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
	SD PM	<u>SCHEDULE L : MECHANICAL EQUIPMENT</u>				
L.1		PUMPS				
L.1.1	SD PM 5.3.1	Supply and install complete with electrical motor, base plate, coupling, pressure gauges on in and outlets, etc. as specified for Grundfos, KSB or similar approved end suction pump with a duty point of 75 l/s @ 105m head	No	3		
L.1.2		Supply and install complete with electrical motor, coupling, etc. for KSB, Grundfos or similar approved submersible pump with a duty point of 150 l/s @ 15m head. Cost to include manifold for duty standby pump, float assembly and anchoring of float assembly in Breede River.	No	2		
L.1.3		Testing and commissioning of pump station	Sum	1		
TOTAL CARRIED FORWARD TO SUMMARY						

ELECTRICAL INSTRUMENTATION AND CONTROL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		<u>SCHEDULE M : ELECTRICAL</u>				
M.1		SECTION 1: BULK LOW VOLTAGE RETICULATION				
M.1.1		LOW VOLTAGE CABLES (PVC/PVC/SWA/PVC, 600/1000V)				
		Supply and install LV cables in sleeves, on cabletray or within trenches.				
M.1.1.1		120mm ² , 4 core, copper; Generator to MCC	m	100		
M.1.1.2		95mm ² , 4 core, copper	m	1		Rate Only
M.1.1.3		70mm ² , 4 core, copper	m	1		Rate Only
M.1.1.4		185mm ² , 4 core, aluminium (stranded)	m	1		Rate Only
M.1.1.5		150mm ² , 4 core, aluminium (stranded)	m	1		Rate Only
M.1.2		LV CABLE TERMINATIONS				
M.1.2.1		Supply and install, including glands, 120mm ² , 4 core, copper; Generator to MCC	No	4		
M.1.2.2		95mm ² , 4 core, copper	No	1		Rate Only
M.1.2.3		70mm ² , 4 core, copper	No	1		Rate Only
M.1.2.4		185mm ² , 4 core, aluminium (stranded)	No	1		Rate Only
M.1.2.5		150mm ² , 4 core, aluminium (stranded)	No	1		Rate Only
M.1.3		EARTH CONTINUITY CONDUCTORS				
		Supply and install bare copper earth conductor, including lugs on cabletray or within trenches.				
M.1.3.1		95mm ²	m	1		Rate Only
M.1.3.2		70mm ² ; Generator to MCC	m	100		
M.1.3.3		35mm ²	m	1		Rate Only
M.1.3.4		16mm ²	m	1		Rate Only
M.1.3.5		10mm ²	m	1		Rate Only
TOTAL CARRIED FORWARD						

ELECTRICAL INSTRUMENTATION AND CONTROL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
M.1.4		EARTH CONDUCTOR TERMINATIONS				
		Supply and install, including lugs and all sundries to facilitate neat termination of earth conductors.				
M.1.4.1		95mm ²	m	1		Rate Only
M.1.4.2		70mm ² ; Generator to MCC	No	4		
M.1.4.3		35mm ²	No	1		Rate Only
M.1.4.4		16mm ²	m	1		Rate Only
M.1.4.5		10mm ²	m	1		Rate Only
M.1.5		CONSUMER LV EARTH (MAIN AND GENERATOR)				
		4 x 20mm dia x 2.4m long copper (steel reinforced) earth spikes, interconnecting 70mm ² bare copper earth wire, earth clamps and lugs. Crow foot earth formation with 3 x 6m lengths.				
M.1.5.1		Supply and delivery	No	1		
M.1.5.2		Installation	No	1		
TOTAL CARRIED FORWARD						

C2.2.147

ELECTRICAL INSTRUMENTATION AND CONTROL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
M.1.6		EXCAVATIONS				
M.1.6.1		CABLE TRENCHES				
		Excavation by hand and later backfilling and consolidation of cable trench (450mm wide) to depths and in material conditions as classified below, excluding bedding sand, but including compaction in 150mm layers:				
M.1.6.1.1		950mm deep in class 1: Soft rock and earth	m	55		
M.1.6.1.2		950mm deep in class 2: Hard rock	m	5		
M.1.6.1.3		950mm deep in class 3: Very hard rock	m	1		Rate Only
M.1.6.2		BEDDING SAND				
M.1.6.2.1		Importing of bedding sand	m ³	10		
M.1.6.2.2		Installation of bedding sand in trench	m ³	10		
M.1.6.3		PVC DANGER TAPE (300mm wide)				
M.1.6.3.1		Supply and delivery	m	60		
M.1.6.3.2		Installation in trench, excluding excavation and backfilling	m	60		
M.1.6.4		CONCRETE CABLE MARKERS				
M.1.6.4.1		Supply and delivery	No	1		Rate Only
M.1.6.4.2		Installation, including excavation and backfilling	No	1		Rate only
TOTAL CARRIED FORWARD						

ELECTRICAL INSTRUMENTATION AND CONTROL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
M.2		SECTION 2: PUMPSTATION AND EQUIPMENT ELECTRICAL				
M.2.1		MOTOR CONTROL CENTRE (MCC)				
M.2.1.1		Supply and install control panel including PLC, HMI, interface equipment, VSD's, PSU's, and equipment as specified.	PC Sum	1	2 000 000,00	2 000 000,00
M.2.1.2		Profit and Attendance	%		2000000	
M.2.2		LOW VOLTAGE CABLES (PVC/PVC/SWA/PVC, 600/1000V)				
		Supply and install LV cables in sleeves, on cabletray or within trenches.				
M.2.2.1		120mm ² , 4 core, copper	m	1		Rate only
M.2.2.2		95mm ² , 4 core, copper; MCC to Pump	m	30		
M.2.2.3		70mm ² , 4 core, copper	m	1		Rate only
M.2.2.4		16mm ² , 4 core, copper; MCC to River Pump	m	60		
M.2.2.5		2,5mm ² , 2 core, copper; MCC to E/stop	m	30		
M.2.3		LV CABLE TERMINATIONS				
		Supply and install, including glands, shrouds, lugs and all sundries to facilitate neat termination of cables.				
M.2.3.1		120mm ² , 4 core, copper	No	1		Rate only
M.2.3.2		95mm ² , 4 core, copper; MCC to Pump	No	6		
M.2.3.3		70mm ² , 4 core, copper	No	1		Rate only
M.2.3.4		16mm ² , 4 core, copper; MCC to River Pump	No	4		
TOTAL CARRIED FORWARD						

ELECTRICAL INSTRUMENTATION AND CONTROL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
M.2.3.5		2,5mm ² , 2 core, copper; MCC to E/stop	No	6		
M.2.4		EARTH CONTINUITY CONDUCTORS (ECC)				
		Supply and install insulated copper earth conductor, including lugs on cabletray or within trenches.				
M.2.4.1		95mm ²	m	1		Rate only
M.2.4.2		70mm ² ; MCC to Pump	m	30		
M.2.4.3		10mm ² ; MCC to River Pump	m	60		
M.2.5		EARTH CONDUCTOR TERMINATIONS				
		Supply and install, including lugs and all				
M.2.5.1		95mm ²	No	1		Rate only
M.2.5.2		70mm ² ; MCC to Pump	No	6		
M.2.5.3		10mm ² ; MCC to River Pump	No	4		
TOTAL CARRIED FORWARD						

ELECTRICAL INSTRUMENTATION AND CONTROL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
M.2.6		BUILDING ELECTRICAL (RATE PER POINT)				
M.2.6.1		LIGHTING				
		Supply and install, including luminaire, fixing materials, hoisting equipment, conduiting, outlet boxes, wiring, 5A unswitched socket outlets, termination and connection, sundries.				
M.2.6.1.1		36W/4000K LED Vapourproof luminaire, surface, 5yr guarantee	No	6		Rate Only
M.2.6.1.2		20W, 4000K, LED bulkhead, die-cast aluminium, polycarb diffuser, square, surface, 5yr guarantee	No	6		Rate Only
M.2.6.2		LIGHT SWITCHES & ACCESSORIES				
		Supply and install, including conduit, wiring, outlet box, cradle and coverplate, termination and connection, fixing material, sundries.				
M.2.6.2.1		1 x 16A, 1 way, recessed	No	1		Rate Only
M.2.6.2.2		1 x 16A, 2 way, recessed	No	2		Rate Only
M.2.6.2.3		20A Photocell, bulkhead, surface	No	1		Rate Only
M.2.6.3		SMALL POWER				
		Supply and install, including conduiting, wiring, outlet boxes, covers, drawwire, termination and connection and sundries.				
M.2.6.3.1		1 x 16A normal combination switched socket outlet, recessed	No	2		Rate Only
M.2.6.3.2		1 x 16A normal combination switched socket outlet, weatherproof	No	2		Rate Only
TOTAL CARRIED FORWARD						

ELECTRICAL INSTRUMENTATION AND CONTROL

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
M.2.6.4		AUXILLIARY OUTLETS				
		Supply and install, including 25mm dia conduiting, wiring, outlet boxes, covers, drawwire and sundries.				
M.2.6.4.1		50mm dia round outlet box, recessed; Cameras / PIR Detectors	No	8		Rate Only
		50mm dia round outlet box, recessed; Door Contacts	No	2		Rate Only
M.2.6.4.2		100 x 100mm outlet box, Alarm Keypad	No	2		Rate Only
M.2.7		INSTRUMENTATION AND CABLING				
		Supply and install, including termination and connection of instrumentation cable, fixing material, sundries.				
M.2.7.1		Pressure Sensor, analogue	No	1		
M.2.7.2		Level Sensor, ultrasonic	No	1		
M.2.7.3		Dekabon cable, 1mm ² /2 pair	m	100		
M.2.8		CABLE TRAYS				
		Supply and install galv. cabletray, include 90° bends, T-pieces, 45deg offsets, cross covers, splice kits, suspension/wall brackets and hangers, slotted angles, suspension rods, fixing material, wastage, hoisting equipment and sundries.				
M.2.8.1		150mm wiremesh, heavy duty	m	30		
M.2.8.2		300mm wiremesh, heavy duty	m	5		
M.2.9		EQUIPMENT ELECTRICAL CONNECTIONS				
		Supply and install, excluding termination and connection of cable				
M.2.9.1		20A TP Isolator, weatherproof	No	1		
M.2.9.2		20A DP Isolator, weatherproof	No	1		
M.2.9.3		Emergency Stop, twist-to-release, weatherproof	No	3		
M.2.10		TESTING AND COMMISSIONING	Sum	1		
TOTAL CARRIED FORWARD TO SUMMARY						

SUMMARY

SUMMARY	Page No.	Amount	
		R	c
<u>SCHEDULES</u>			
SCHEDULE A: PRELIMINARY AND GENERAL	129		
SCHEDULE B: SITE CLEARANCE	132		
SCHEDULE C: EARTHWORKS GENERAL	133		
SCHEDULE D: EARTHWORKS PIPES	134		
SCHEDULE E: CONCRETE (STRUCTURAL)	137		
SCHEDULE F: STRUCTURAL STEEL AND TIMBER	138		
SCHEDULE G: MEDIUM PRESSURE PIPELINES	140		
SCHEDULE H: BUILDING WORKS	142		
SCHEDULE J: BEDDING (PIPES)	143		
SCHEDULE K: RESERVOIR	144		
SCHEDULE L: MECHANICAL EQUIPMENT	145		
SCHEDULE M: ELECTRICAL INSTRUMENTATION AND CONTROL	152		
SUB-TOTAL:			
ADD: Contingencies of 10%:			
SUB-TOTAL:			
ADD: VAT at the Rate of 15%:			
Carried to Part C1.1 - Form of Offer and Acceptance:			

DECLARATION (In respect of completeness of Tender)

To:

Municipal Manager
Langeberg Municipality
28 Main Street,
Ashton

I/we, the undersigned, do hereby declare that these are the properly priced Bills of Quantities forming Part C2.3 of this Contract Document containing **25 pages** (including the summary page) in consecutive order upon which my/our tender for **TENDER T13/2025 : BREEDE RIVER RAW WATER PUMPSTATION PORTION 2, ASHTON** has been based.

SIGNATURE OF TENDERER/S

DATE

Part C3: Scope of Work

	Page
C3.1 Description of the Works	156
C3.2 Engineering.....	161
C3.3 Procurement	162
C3.4 Construction	163
C3.5 Annexes	286

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 C3.4 and C3.5)
- Standardized Specifications

This **Scope of Works** is set out as follows:

- C 3.1: DESCRIPTION OF THE WORKS** covers a general description of the works or project and the facilities available.
- C 3.2: ENGINEERING** covers a list of drawings and standard drawings supplied separately and/or bound with the tender document
- C 3.3: PROCUREMENT** covers the requirements; resource standard pertaining to targeted procurement, scope of mandatory subcontract works; preferred subcontractors / suppliers; subcontracting procedures; attendance on subcontractors, etc.
- C 3.4: CONSTRUCTION** covers variations and additions to the standard specifications that are applicable to the contract, as well as Particular Specifications that is applicable.

All clauses in the Specification Data are preceded with "SD" followed by the relevant letter(s) and number of the relevant clause of the standard specifications. This will replace, amend or add to the standard specification with the same number. For a new clause, the numbers follow on from the last clause number used in the relevant specification.

Any clause referred to in the standard specification will also include the relevant Specification Data.

The Particular Specifications are the Environmental and Health & Safety Specifications.

- C 3.5: MANAGEMENT** covers the applicable standards and the methods and procedures to be followed in managing the works to the requirements of the Engineer and the Employer.
- C 3.6: ANNEXURES** covers the drawings issued to the Tenderers, project labour report and the Saldanha Bay Preferential Procurement Policy.

C3.1 Description of the Works

C3.1.1 Employer's objectives

This Contract form part of the flood damage repair and upgrade to the Breede River Raw Water Supply Pumpstation. The objective of Langeberg Municipality is to appoint one contractor to construct the all electrical and mechanical equipment inside the new pumpstation building, as well as the floating supply pump, pipelines and storage tank.

C3.1.2 Description of the works

The project entails the construction of a raw water reservoir tank, floating supply pump, electrical and mechanical equipment and various pipework.

C3.1.3 Extent of the Works

The following works is included in the project:

- Installation of electrical and mechanical equipment inside new pumpstation;;
- Supply and installation of floating supply pump;
- Supply and installation of raw water supply reservoir;
- Connecting Pipework;

The bill of quantities and related specification provides more detailed to the above brief outline of the scope of works.

The above description is not necessarily complete and shall not limit the work to be carried out.

C3.1.4 Location of the Works and Access

The Breede River Raw Water Supply Pumpstation is on the banks of the Breede River approximately 13.4km from Robertson on the R317, between Robertson and Bonnievale, at the intersection with DR1358 to Ashton.

C3.1.5 Nature of Ground, Subsoil and Ground Water Conditions

No comprehensive geotechnical investigation was conducted to assess the ground conditions at the proposed pumpstation site, but sandy material with some river boulders is expected.

In general, excavated material will not be suitable for use as bedding for pipelines and material will have to be imported from commercial sources. Allowance will be made in the bill of quantities where bedding or fill material needs to be imported for construction purposes.

Contractors must satisfy themselves regarding the quality and type of material on site, since the Contractor is responsible for the supply of materials in compliance with the minimum requirements for the specific materials.

C3.1.6 Scope of Contract

The scope of the contract includes activities contained in the following schedules:

SCHEDULE A: PRELIMINARY AND GENERAL
SCHEDULE B: SITE CLEARANCE
SCHEDULE C: EARTHWORKS GENERAL
SCHEDULE D: EARTHWORKS PIPES
SCHEDULE E: CONCRETE (STRUCTURAL)
SCHEDULE F: STRUCTURAL STEEL AND TIMBER
SCHEDULE G: MEDIUM PRESSURE PIPELINES
SCHEDULE H: BUILDING WORKS
SCHEDULE J: BEDDING (PIPES)
SCHEDULE K: RESERVOIR
SCHEDULE L: MECHANICAL EQUIPMENT
SCHEDULE M: ELECTRICAL INSTRUMENTATION AND CONTROL

C3.1.7 Construction Program & Methods

C3.1.7.1 Time for Completion and Programme

The contract period must include the normal days of inclement weather as specified in the Specification Data and special non-working days listed in the Contract Data.

The Contractor will be required to develop and maintain for the full duration of the contract, a works programme whose purpose will be to ensure that the work is carried out and controlled in such a way that the contract is completed within the time stated in the tender or in the time extended by the Engineer in writing.

The Contractor shall take all aspects regarding the conditions on site, access, transportation, restricted working space, the availability of material, machines and labour into account during the tender stage and the compiling of a construction programme.

C3.1.8 Known services

The Contractor shall make himself acquainted with all existing works. Under no circumstances shall the Contractor alter or in any way interfere with the existing works or underground services unless authorised by the Engineer.

Where existing works are of such a nature that the Engineer may require them to be moved by the Contractor, the cost of such work will be paid for at scheduled rates or on day works, plant and materials basis. The Contractor will be held responsible for damages to any existing works and any damages caused shall be made good at his own cost without delay.

The Contractor is to exercise care when the proposed work is to cross an existing service, or work is to be performed close to an existing service. Prior to commencement of the relevant portion of the proposed works the Contractor with the Engineer or his duly appointed representative shall also perform a visual inspection of the area in question. This inspection will not waive the Contractor of his obligations with respect care of the works referenced in the General Conditions of Contract.

C3.1.9 Damage to services

Damage that occurs to unknown services during construction will be paid by the Employer. However, all services that have been located and exposed, and are subsequently damaged by the Contractor or his subcontractor, shall be reinstated to the same state as it was before the damage occurred at the time and cost of the Contractor.

C3.1.10 Reinstatement of services and structures damaged during construction

The Contractor shall inform the Engineer immediately when a service or structure is damaged. The extent of the damage and a proposal how to reinstate the service or structure shall be submitted to the Engineer on a sketch with dimensions and time frames.

The Contractor shall not be allowed to reinstate any service or structure unless indicated so by the Engineer. The Contractor shall render all reasonable assistance to the service or structure owner with the reinstatement of the service or the structure if required.

The Contractor shall be liable to reinstate the service or structure to its original state or for the full cost thereof if reinstated by others.

C3.1.11 Services and Site Facilities Provided by the Employer

C3.1.11.1 Water and Electricity Supply

Water for construction is available from the Addo Elephant National Park Main Rest Camp. The Contractor shall arrange with the Park Manager for obtaining water for construction and domestic purposes. The Contractor shall pay for the water at the rates and tariffs as agreed with the Park Manager. The Contractor shall supply and install an approved separate water meter to monitor water usage. The supply and installation of this meter shall be deemed to be included in the rate for fixed price preliminary and general charges of the Bill of Quantities.

The Contractor shall make his own arrangements for the supply of electricity that he may require for the execution of the works and the costs of any connections. All additional reticulation and the supply of electricity shall be borne by the Contractor and shall be deemed to be included in the rate for fixed price preliminary and general charges of the Bill of Quantities.

C3.1.11.2 Fuel

The Contractor must note that there is no fuelling stations near the Site of Works and all fuel for construction must be carted to the site.

C3.1.12 Services and Provided by the Employer

C3.1.12.1 Facilities provided by the Contractor

The Contractor shall provide, maintain and remove his own facilities to the satisfaction of the Engineer. The Contractor shall provide the area around his office, stores and sheds (i.e. the "Camp") with adequate security fences to ensure that unauthorised persons do not enter the camp area and security personnel should he deem it necessary.

The tendered sums as scheduled by the Contractor, whether grouped or individually, shall include all costs for the installation, maintenance and removal of the fencing as specified, in addition to all other facilities specified and as required by the Contractor for his own purposes

C3.1.12.2 Location of Camp Site

The location of the Contractor's camp shall be pointed out at the tender briefing meeting and will be within the boundaries or close to the proposed pumpstation.

The Contractor must note that the site camp is adjacent to the Breede River and this must be taken into consideration when planning the site camp. The camp site shall be properly and neatly fenced using temporary fencing with secure access control. The Contractor shall be responsible for providing and maintaining his own security arrangements for the duration of the Contract.

On completion of the Works, or when ordered by the Engineer, the Contractor shall remove all temporary buildings and latrines and restore the Site to a clean and sanitary condition to the satisfaction of the Engineer.

Access to the site will be in a controlled manner. People visiting the site will have to sign in and out on a daily basis.

C3.1.12.3 Ablution facilities

Ablution facilities are not available on site. The Contractor shall make the necessary arrangement to provide these facilities. Chemical serviced toilets shall be the minimum acceptable standard. These must be placed in a position to be approved by the Engineer. The facilities must be to the Engineer's approval and must be maintained in a clean and sanitary condition.

C3.1.12.4 Housing for Contractor's employees

No housing is available for the Contractor's employees on site and the Contractor shall make his own arrangements for housing his employees and transporting them to and from the site. The Contractor is in all respects responsible for the housing and transporting of his employees, and for the arrangement thereof, and no extension of time due to any delays resulting from this, will be granted.

C3.1.13 Facilities for the Engineer

C3.1.13.1 Office accommodation

No office facilities are required for the Engineer.

C3.1.13.2 Survey equipment and assistants

Both are required for the Contract.

C3.1.13.3 Site instruction book and Site diary

The Contractor shall keep a triplicate book for site instructions on the Site at all times and provide a Site diary for daily completion by the Contractor.

C3.1.14 Laboratory Facilities

The Contractor shall provide and allow for his own facilities, apparatus and procedures for the testing of materials and the process control testing of materials and workmanship in order to ensure compliance with the requirements of the Specifications. The Engineer shall only carry out control tests.

C3.1.15 Other facilities and services

C3.1.15.1 Waste Disposal

The Contractor shall make arrangements for solid and liquid waste disposal with Local Authority. Disposal will take place at an approved Site.

C3.1.15.2 Telephone Facilities

There are no telephone facilities available, but there is normally cellular reception at the Site of Works.

C3.1.16 Notice boards, signs, barricades and advertisements

All notices, signs and barricades may be used only if approved by the Engineer. The Contractor shall be responsible for their supply, erection, maintenance and ultimate removal and shall make provision for this in his tendered rates.

The Engineer shall have the right to instruct the Contractor to move any sign or notice to another position, or to remove it from the Site of the Works if in his opinion it is unsatisfactory, inconvenient or dangerous.

C3.1.17 Dealing with water

The Contractor shall make provision and allow for all dewatering and temporary management of storm water. All costs for this operation for the duration of the contract shall be deemed to be included in the Fixed and Value related charges.

C3.1.18 Dealing with high winds

The site is situated in a region where high winds and seasonal rain can be expected and with strong south-easterly winds during the summer months.

All heaps of materials either forming part of the excavations or imported for use in construction shall be kept covered during high winds to prevent contamination of surrounding in-situ soils.

C3.1.19 Alterations, additions, extensions and modifications to existing works

The Contractor shall within 20 days or 10% of the construction period after taking possession of the site (whichever is the lesser), satisfy himself that the dimensional accuracy, alignment, levels and setting out of existing structures or components thereof are compatible with the proposed works and shall notify the Engineer of any areas of dissatisfaction.

C3.1.20 Wayleaves, Permissions and Permits

The Contractor shall be responsible for obtaining all of the necessary wayleaves, permissions or permits applicable to working near any existing services or other infrastructure on Site, and shall ensure that any wayleaves, permissions or permits obtained by the Employer's Agent prior to the award of the contract are transferred into the Contractor's name.

The Contractor shall abide by any conditions imposed by such wayleaves, permissions or permits.

The Contractor shall ensure that all wayleaves, permissions and permits are kept on site and are available for inspection by the relevant service authorities on demand.

The Contractor shall also ensure that any wayleaves in respect of electricity services are renewed timeously every three months.

C3.1.21 Construction in restricted areas

All working space will be deemed restricted. The construction method used in these restricted areas largely depends on the Contractor's Plant. Notwithstanding, measurement and payment will be strictly according to the specified cross-sections and dimensions irrespective of the method used, and the rates and prices tendered will be deemed to include full compensation for any difficulties encountered by the Contractor while working in restricted areas. No extra payment or any claim for payment due to these difficulties will be considered.

C3.1.22 Spoiling areas

The spoiling area(s) for excess material, as well as the routes to the spoil areas, must be determined by the Contractor and approved by the Engineer.

C3.2 Engineering

C3.2.1 Design Services and Activity Matrix

Works designed by, and per design stage:

Concept, feasibility and overall process	Employer (Engineer)
Basic engineering and detail layout to tender stage	Employer (Engineer)
Final design to approval for construction	Employer (Engineer)
Temporary Works	Contractor
Preparation of "as-built" drawings	Contractor

C3.2.2 Employer's design

The Employer's design is contained in the Tender Documentation and Drawings. Amendments to the design, if necessary, will be issued during the construction phase.

C3.2.3 Design brief

Where the Contractor is to supply the design of designated parts of the permanent Works or temporary Works he shall supply full working drawings supported by a professional engineer's design certificate.

C3.2.4 Drawings

The Contractor shall use only the dimensions stated in figures on the Drawings in setting out the Works, and dimensions shall not be scaled from the Drawings, unless required by the Engineer. The Engineer will, at the request of the Contractor in accordance with the provisions of the Conditions of Contract, provide such dimensions as may have been omitted from the Drawings.

The Contractor shall ensure that accurate as-built records are kept of all infrastructure installed or relocated during the contract. The position of all underground infrastructures shall be given by either co-ordinates or stake value and offset. Where necessary, levels shall also be given. A marked-up set of drawings shall also be kept and updated by the Contractor. This information shall be supplied to the Engineer's Representative on a regular basis.

All information in possession of the Contractor, required by the Engineer and/or the Engineer's Representative to complete the as-built/record drawings, must be submitted to the Engineer's Representative before a Certificate of Completion will be issued.

The Drawings prepared by the Employer for the permanent Works applicable to the contract are issued with this tender document. The Employer reserves the right to issue and/or amended additional drawings during the Contract.

The drawings listed below are issued with the tender document in order to give an overview of the project. Additional construction drawings will, in terms of the General Conditions of Contract, be issued to the Contractor by the Engineer / Employer on the commencement date and from time to time as required.

Drawing Number	Title
CIVIL DRAWINGS	
2302582/C/02	Proposed Upgrades Portion 1 & 2
2302582/C/100	Locality Plan
2302582/C/101	Nameboard Detail
2302582/C/103	Pumpstation Layout, sections & details
2302582/C/104	Pumpstation Chambers
ARCHITECTURAL DRAWINGS	
SD1 – 100	Pumpstation Building Floor Plan
SD1 – 301	Pumpstation Building Sections
ELECTRICAL DRAWINGS	
2302582/E/001	Pumpstation Electrical Reticulation

C3.3 Procurement

C3.3.1 PREFERENTIAL PROCUREMENT

The works shall be executed in accordance with the conditions associated with the granting of preferences detailed in Form SBD 6.1: Preference Points Claim Form in Terms of the Preferential Procurement Policy Framework Act 2017, where preferences are granted in respect of B-BBEE contribution. In particular, the Contractor may not sub-contract more than 25% of the value of the contract to sub-contractors that do not have an equal or higher B-BBEE status level than the Contractor, unless the sub-contractors are exempted micro enterprises that have the capability and ability to execute the sub-contract works. All sub-contracts to be approved by the Engineer.

C3.3.2 SCOPE OF MANDATORY SUBCONTRACT WORK

No mandatory subcontract work is envisaged under this contract.

C3.3.3 SUBCONTRACTORS

C3.3.3.1 Procedure for the selection of sub-contractors/suppliers

Where monetary allowances for provisional sums or prime cost items have been provided in the Bills of Quantities, and where the work is to be executed/supplied by sub-contractors/suppliers then the following selection process shall be followed in respect of the required sub-contractors/suppliers:

The Contractor shall invite three quotations from suitably qualified sub-contractors/suppliers, the selection of which shall be in consultation with, and to the approval of the Engineer, for the required work or items.

The evaluation of the quotation received must include a preference points system as described in 5.11 of the Tender Data.

C3.3.3.2 Attendance on subcontractors

Approval given in terms of subcontracting shall not relieve the Contractor of any responsibility, duty or obligation imposed upon him by the Contract, and the Contractor shall in particular be and remain solely liable and responsible for all acts, omissions, negligence or breaches of contract on the part of the assignee or any of his employees, and for all acts, omissions or negligence of any Sub- Contractor or any of his employees.

C3.4 Construction

PART A: STANDARD SPECIFICATIONS

PART B: SPECIFICATION DATA

The Specification Data contains variations and additions to the SANS 1200 Standardized Specifications.
The Specification Data is contained in Part B.

PART C: PARTICULAR SPECIFICATIONS

PART A: STANDARD SPECIFICATIONS

The **Standard Specifications for Civil Engineering Construction, SANS 1200**, shall form the Standard Specifications applicable to this contract. It is a requirement of this contract that the Contractor shall have a full set of the Standard Specifications available on site full time.

These specifications are obtainable from the South African Institute of Civil Engineers (SAICE), Private Bag X200, Halfway House 1685, Tel: (011) 805-5947, Fax: (011) 805-5971, e-mail: civilinfo@saice.org.za.

The following relevant sections of the Standard Specifications, as listed below, shall apply to this contract:

Section	Description
A:	GENERAL
AB:	ENGINEER'S OFFICE
C:	SITE CLEARANCE
D:	EARTHWORKS
DB:	EARTHWORKS (PIPE TRENCHES)
G:	CONCRETE (STRUCTURAL)
HA:	STRUCTURAL STEELWORK (SUNDRY ITEMS)
L:	MEDIUM PRESSURE PIPELINES
LB:	BEDDING (PIPES)

PART B: SPECIFICATION DATA

The following variations and additions to the SANS 1200 Standardized Specifications will be valid for this contract. The prefix "SD A" indicates an amendment to SANS 1200 A, "SD C" to SANS 1200 C, etc. The numbers following these prefixes are the relevant clause numbers in SANS 1200. This will replace, amend or add to the standard specification with the same number. For a new clause the numbers follow on from the last clause number used in the relevant specification.

SANS A: GENERAL

SD A 1: SCOPE

Replace subclause 1.1 with the following:

"This specification covers requirements, principles and responsibilities of a general nature which are normally applicable to all civil engineering contracts as well as the requirements for the contractor's establishment on site."

SD A 2: INTERPRETATIONS

SDA 2.3: Definitions

(a) General

Add the following definitions:

"General conditions: The general conditions of contract specified for use with this contract and the special conditions of contract as applicable.

Specified: As specified in the standardized specifications, the drawings or the Specification Data. Specifications shall have the corresponding meaning."

(c) Measurement and payment

Replace the definitions for fixed charge, time-related charge and value-related charge with the following:

"Fixed charge: A charge that is not subject to adjustment on account of variation in the value of the contract amount or the contract time of completion.

Time-related charge: A charge, the amount of which is varied in accordance with the time for completion of the work as adjusted in accordance with the provisions of the contract.

Value-related charge: A charge, the amount of which is varied pro rata the final value of the measured work executed and valued in accordance with the provisions of the contract."

A3: MATERIALS

SD A 3: Quality

Substitute the second sentence of the first paragraph of A3.1 with the following:

"Where a material to be used in this Contract is specified to comply with the requirements of an SANS Standard Specification, and such material is available with the official SANS mark, the material used shall bear the official mark."

Substitute the second paragraph with the following:

"Samples on which control testing is required by the Engineer, shall be delivered free of charge to an SANAS approved commercial laboratory. The Contractor is responsible for the cost of all testing to ascertain that the materials do comply with the relevant minimum requirements and all such costs shall be deemed to be included in the tendered rates. The cost of control test done by the Engineer and of which the results do not comply with the minimum requirements shall be for the Contractor's account.

The Contractor shall inform the Engineer of any control testing to be done at least 48 hours before such test are required and must allow in his programme for the time necessary for the tests and the processing of the results thereof."

Add the following sub-clause to Clause A3:

SD A 3.3: Ordering of materials

The quantities set out in the Bill of Quantities have been determined from calculations based on data available at the time and should therefore be considered to be only approximate quantities. The contractor shall therefore, verify the quantities before ordering materials of any kind. No liability or responsibility whatsoever shall be attached to the Employer for materials ordered by the contractor except if they have been ordered in accordance with written confirmation issued by the engineer.

The Contractor shall satisfy himself of the continuous availability of material. No extension of time or additional compensation will be granted if material cannot be obtained locally or has to be sourced elsewhere."

A 4: PLANT

SD A 4.2: Contractor's Office, Stores and Services

Add the following paragraph before the first paragraph:

"The Contractor's construction camp shall be fenced off and shall contain all offices, stores, workshops, testing laboratories, toilet facilities, etc. The camp shall always be kept in a neat and tidy condition.

Add the following the second paragraph:

"One toilet per 10 workmen shall be provided and must be screened from public view and their use shall be enforced.

The contractor shall make arrangements if necessary for the removal of night soil."

Add the following to A 4.2:

"The Contractor's Construction Manager (Site Agent) or representative must be contactable at all times by phone. Should use be made of radio and or cellular-phones, these must be operational at all times with sufficient back-up batteries or recharging facilities.

There exists no housing facilities for the Contractor's work force, and arrangements must be made by the Contractor to accomplish that as well as transport of workers. The Contractor is solely responsible for their housing, or the arranging thereof, and no payment or extension of time will be allowed because of any delay and/or work damage that may arise. No personnel will be allowed to reside on the site. Only night-watchmen may be on the site after hours."

Add the following after Clause A 4.2:

SD A 4.3: Medical facilities and safety equipment

The suitable first aid services required in terms of Subclause 4.2 of SANS 1200 A shall include, inter alia, a First Aid cabinet fully equipped and maintained with at least the minimum contents as listed in the Annexure (Regulation 3) to the General Safety Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), to deal with accidents and ailments which are likely to occur during the construction period.

The Contractor shall provide personal safety equipment and facilities as required by Regulation 2 of the General Safety Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993)."

On completion of the Works the Contractor shall scarify all disturbed areas where offices, stores, etc., were located and all temporary roads and tracks, and he shall place a 100 mm thick layer of approved topsoil over all such areas. These areas shall then be seeded with an approved indigenous grass or other approved seed, watered and fertilized in an approved manner and in such quantity as to promote rapid growth. The cost for placing the 100mm layer of topsoil shall be deemed to be included in the rates tendered for the site facilities.

A 5: CONSTRUCTION

A 5.1: Survey

SD A 5.1.1: Setting out of the Works

Add the following to A 5.1.1:

Setting out of the works is the sole responsibility of the Contractor and shall be done from the control points present on site and shown on the construction drawings.

The Contractor shall within two (2) weeks after the commencement date, check levels over all reference pegs and benchmarks and line pegs. This must be done before the Contractor intends constructing any portion of the Works influenced by such pegs or benchmarks. 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. The Contractor shall advise the Engineer of any conflict between the position of any part of the Works and an existing feature. Any costs or subsequent costs arising from discrepancies, which have not been reported to the Engineer within the aforementioned period, shall be the sole responsibility of the Contractor. 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 benchmarks are correct.

"The Contractor shall be responsible for the true and proper setting out of the Works and for the correctness of the position, levels, dimensions and alignment of all parts of the Works and for the provisions of all necessary instruments, appliances and labour in connection therewith.

The Contractor shall carefully protect and preserve all benchmarks, sight-rails, pegs and other things used in setting out the Works.

The checking of any setting-out or of any line or level by the Engineer shall not relieve the Contractor of his responsibility for the correctness thereof.

If at any time during the progress of the Works, any error shall appear or arise in the position, levels, dimensions or alignment of any part of the Works, the Contractor, on being required to do so by the Engineer, shall at his own expense rectify such error to the satisfaction of the Engineer, but if such error is based on incorrect data supplied in writing by the Engineer or if there is any delay in providing the particulars required, the Contractor shall, in respect of that delay and the Cost of such rectification, be entitled to make a claim in accordance with Clause 10 of General Condition of Contract (Third Edition 2015).

SD A 5.1.2: Preservation and replacement of beacons and pegs subject to the land survey act

Add the following to A 5.1.2:

"Immediately upon taking over the site the Contractor shall identify and mark all relevant cadastral boundary pegs. After the completion of mass earthworks, the Contractor shall, under the direction of the Engineer, search for these pegs and compile a list of such pegs that are apparently in their correct positions. The Contractor shall certify this list for future reference.

In the case where cadastral boundary pegs have already been placed, these pegs will be pointed out and handed over to the Contractor and he shall take all precautions necessary to ensure that such pegs and the pegs referred to in SDA 5.1.1 are not disturbed or destroyed. Any costs in connection with the replacement of pegs for which the Contractor is responsible in terms of Sub-clause 5.1.2 will be recoverable from the Contractor by deduction from the monthly certificate of payment.

A Land Surveyor shall verify all cadastral boundary pegs after the completion of all operations. All disturbed pegs shall be replaced at the Contractors expense."

SD A 5.2: Watching, Barricading, Electric Lighting and Traffic Crossing

Add the following to A 5.2:

"The crossing of existing entrances to sites and streets must be done so that free access is ensured at all times.

The crossing of roads with services must be done in half-widths to ensure vehicular access at all times. Traffic control shall be done with Stop/Go sign control with the relevant road signs during daytime. The Contractor must use hazard lights to warn traffic at night. All excavations must be marked with drums, reflecting tape and warning signs to satisfaction of the Engineer.

Road traffic signs shall comply with the requirements of the "South African Road Traffic Signs Manual"

and shall be approved by the Engineer before construction commences." Refer to chapter 13.

SD A 5.4: Protection of the overhead and underground services

Add the following to A 5.4:

"The Contractor shall as soon as possible after handing over of the site, commence with the detection of existing services, continuously without interruptions and finalize it at least 7 days before excavation starts at that particular section.

Provision must be made for the protection and maintenance of existing services for the duration of the contract. No payment will be made in respect of this and all costs must be included in the tendered rates. All such services, the positions of which have been located at the critical points, shall be designated as "known" services and their positions shall be indicated on a separate set of drawings, a copy of which shall be furnished to the Engineer.

While he is in occupation of the site, the Contractor shall be liable for all damage caused by him to known services as well as for consequential damage arising there from, whether caused directly by his operations or by lack of proper protection."

Various services are known to exist on the site. Their approximate positions are shown on the drawings but, although they are based on the best information available, their accuracy cannot be guaranteed. It is likely that other services that are not shown on the drawings exist along the route of the pipeline.

All services, in particular cables, shall be treated as live until proven otherwise.

Before the commencement of any excavation the Contractor shall confirm the name and telephone number of the relevant officials directly concerned with the known or suspected services, shall acquaint himself with the position of the control points of the services and shall have readily available the equipment necessary to shut-off and isolate any such service. The Contractor shall liaise with the relevant authorities or controlling bodies for the necessary temporary closure of any services during construction.

Before any work that involves services to any property is carried out, the Contractor shall serve notice on the resident, occupier and/or owner of every property, at least 7 working days in advance of any temporary disconnection, advising the nature, time and duration.

In addition to the requirements of Subclause 5.4 the Contractor shall deal with the crossing of known existing services by the pipelines by:

- a) Notifying to the Engineer's Representative and the relevant authority 48 hours prior to executing the work.
- b) Serving notice on the resident, occupier and/or owner of every property affected at least 36 hours in advance of any temporary disconnection, advising the nature, time and duration.
- c) Excavating by hand, under the supervision of the Engineer's Representative and/or the authority involved, on the line of the trench up to 2 m, or such for the distance as may be necessary, in both directions from the indicated position to locate the exact position of the services.

Work done by service authorities:

The Contractor shall give assistance to service authorities with the location, protection, alteration and/or removal of services controlled by that authority.

Electricity cables:

The Contractors shall at all times accept that all underground and overhead cables are live and that Cape Town Municipality nor Eskom nor Telkom, in their 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 the live electricity cables exposed under the Contract.

SD A 5.6: Pollution

The Contractor's attention is drawn specifically to dust disturbance, due to the fact that the works takes place near an existing residential area (See SD D 5.1.4.1).

Add the following sub clause to A 5:

SD A 5.9: Workmen's Compensation Act

It is a requirement of this contract that all labour employed on the site be covered by the Workmen's Compensation Act. The Contractor is to arrange a suitable method of complying with the Act including the payment of the necessary levies."

A7: TESTING

SD A 7.4: Statistical analysis of control tests

Replace A 7.4 with the following:

"Test results will not be analysed by statistical methods, and all results must comply with the minimum requirements of the materials concerned."

A 8: MEASUREMENT AND PAYMENT

A 8.1: Measurement

Add the following sub clause to A 8.1.1:

Free haul and Overhaul

Notwithstanding any clauses in any of the Standardized Specifications or Standard Specification Section dealing with the definition, no measurement and/or payment for overhaul will be made. All haulage will be considered to be free haul and the cost thereof will be deemed to be covered by other rates in the Bill of Quantities."

SD A 8.2: Payment

Add the following sub clause to A 8.2:

SD A 8.2.5: Adjusted payment for time-related items

The payment to the Contractor for time-related items shall be adjusted in accordance with the following formula in the event of the contract being extended:

$$\text{Sum of Tendered amounts for time-related items} \times \frac{\text{Extended Contract Period As Authorised By Variation Order}}{\text{Tender Contract Period}}$$

The abovementioned adjustment of the payment for time-related items shall be made in the Completion Payment Certificate and shall be the only payment for additional time-related costs.

SD A 8.3.2.3: Dealing with water

Add the following to A 8.3.2.3:

In addition to the above, the tendered rates for A 8.3.2.2 (h), Dealing with water, shall include all costs necessary for the control of surface water in all excavations on site as well as for the control of ground water for all excavations except the bulk excavation of the clarifier, which is allowed for under SD D 8.3.15.

SD A 8.3.2.3: Access

Add the following to A 8.3.2.3:

In addition to the above, the tendered rates for A 8.3.2.2 (i), Access, shall include all costs including materials for the building, gravelling and maintenance of access roads to the works, borrow pits and spoil sites, as well as the breaking up and, the removing or clearing and tidying up of such roads on completion of the works, in addition to keeping all spoil routes clean throughout the contract. Upon completion of the Works, all access routes should be in the same condition as is was prior to commencement of the Works, as approved by the Engineer.

SD A8.5(b)1: Amount allowed provisionally by Engineer for work done by nominated Sub-Contractor.....Unit: Prov. Sum

Add the following to A 8.5(b)(i):

"Payment will be in accordance with Clause 6.10 of the General Conditions of Contract (Third Edition,

2015)."

SD A8.5(b)2: Percentage allowed for supervision, management and co-operation with nominated Sub-Contractor..... Unit: %

Add the following to A8.5(b)(ii):

"The tender percentage includes full compensation for supervision and control over the nominated sub-contractor, delays, profits, etc.

The percentage will be calculated on the final amount paid under SD A 8.5."

SD A 8.7: Day work

Add the following:

"Day work will be paid according to the percentage allowance method for items not included in a Schedule of Day work rates. In this case, for calculating the total remuneration the General Conditions of Contract for the Construction of Civil Engineering Work, Third Edition (2015) shall apply, with the amendments as in the appropriate special conditions of contract, which are bound into this document. A day work schedule will be provided for filling in the necessary information. A working day will consist of 9.25 hours per day only."

Add the following sub-clause to A8.7:

SD A 8.7.1: Standing time costs

- a) Plant: Unit: working day
- b) Labour Unit: working day
- c) Other resources (to be specified by Contractor) Unit: working day

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

Standing time will not be paid for any costs that are recoverable through extension of time.

For purpose of calculating the total standing time cost, a working week shall be held to consist of five working days and a working day of 9,25 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 part of a day, will be made pro-rata in proportion to an appropriate factor assessed by the Engineer.

The amounts by which the standing time costs are 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 of boycott. Costs for delays incurred for all other circumstances shall be treated as provided for in the conditions of contract.

The provision of this clause shall in no way prejudice the right of either the Employer or the Contractor to determine the contract in terms of the provisions of Clause 9.1 of the General Conditions of Contract (2015).

The Contractor shall take note that no payment will be considered for additional cost or 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 protecting his equipment and site establishment, or loss incurred in respect of damage to construction plant, equipment and materials supplied and the works. In the event that Clause 5.13.1 of the General Conditions of Contract (2015) becomes applicable, the time on which such penalties are calculated shall be reduced by the total standing time approved by the Engineer.

SD A 8.8.2: Accommodation of traffic..... Unit: Sum

Add the following to A 8.8.2:

"Separate items for traffic accommodation for the various activities on site for which it will be required will not be listed or paid for and all traffic accommodation required anywhere on site for the duration of this contract will be deemed to be allowed for in the tendered rate for this item.

For all of these items the tendered rate covers all costs in respect of the supplying, erection, moving, re-erection and maintenance of all temporary barricades, road signs, lights and flagmen that are required for the protection and safe guarding of the works (all as per the S.A. Road Traffic Signs manual) Chapter 13, for making the necessary traffic arrangements and arrangements with regards to the regulations in respect of moving and/or the re-erection of existing road signs, as well as other costs that may arise during construction in respect of the traffic. No old style signs shall be permitted."

SD A 8.8.5(b) 2: Cost of survey in terms of the land surveying act: Unit: Sum

Replace A 8.8.5 with the following:

"The amount covers all costs in respect of labour, materials and equipment needed for the finding, noting and compilation of a list and protecting of pegs, all of which are described in Clause 5.1.2 of SANS 1200 A."

SD A 8.9: Environmental Control Unit: Sum

The Contractor is required to implement measures and to adhere to the conditions of the Environmental Management Specification for the duration of the contract. The Tendered rate shall be an all-inclusive sum for adhering to the EMP.

SD A 8.10: Implementation and adherence to the Occupational Health and Safety Act Unit: Sum

The Contractor is required to implement measures and to adhere to these conditions for the duration of the contract. The Tendered rate shall be an all-inclusive sum for adhering to the Health and Safety Specifications.

The rate shall also allow for the preparation of a site specific Safety Plan which need to be approved before commencement of the Works, keeping the Safety File up to date for the duration of the project and submitting the final Safety File to the Client's Agent upon completion of the project. 25% of the rate allowed for this item, will only be payable upon approval by the Client's Agent of the final Safety File, comprising the minimum suggestions as per the Health and Safety Specification.

SD A 8.11: Preparation of as-built drawings Unit: Sum

The rate shall allow for the accurate measuring and marking up of all as-built information on a clean set of the working drawings (set of clean drawings to be supplied by the Engineer).

The rate shall also allow for a comprehensive survey (X, Y and Z-coordinates) by a qualified land surveyor of all the works completed under this contract, as well as the existing dry beds, the northern aerobic reactor and the chlorination channel. The survey should include invert levels and cover levels of manholes and chambers, invert levels of pipes at all inlets and outlets, and all the levels of the new clarifier, and existing northern aerobic reactor, dry beds and chlorine contact channel structures. The information should be supplied as a AutoCad drawing (.dwg format), a XYZ file (.txt or .xls format) and a DTM file (.landxml format).

SANS AB: ENGINEERS OFFICE

AB 3: MATERIAL

SD AB 3.1: Name boards

Substitute "South African Institution of Civil Engineers" in the first paragraph of AB 3.1 with "South African Association of Consulting Engineers".

One name board must be erected on site, situated as specified by the Engineer. The board will be as specified on the standard detail drawing bound into this document.

SD AB 3.2: Office Buildings

Substitute "as detailed in the project specification" with "of a 9000 BTU air-conditioner unit"

Add the following to AB 3.2:

k) suitable power supply for computer, lighting and air-conditioner unit

SD AB 3.3 Carports

The Contractor shall provide, maintain and service a parking facility for the use of the Engineer and his personnel. The facility shall consist of one covered carports with closed sides. The carport shall measure at least 6.0 x 3.5m and shall have a roof 2.4m above a free draining gravelled surface.

SD AB 3.4 Protective clothing

The Contractor shall provide and replace when necessary one set of rubber wellington boots (of sizes as required), reflective safety jacket and hard hat to the Engineer and Engineer's Representative.

SD AB 4.2 Medical facilities and safety equipment

The Contractor shall make the first aid services and such personal safety equipment and facilities as are required in terms of SD A 4.3, available to the Engineer and his site staff.

AB 5: CONSTRUCTION

SD AB 5.1: Name boards

Add the following to AB 5.1:

The name board(s) shall be erected within a month of the commencement date of the contract and shall be placed at the positions indicated by the Engineer. Any damage to these boards shall be repaired within fourteen days of a written instruction issued by the Engineer. No payment shall be made in terms of the contract prior to the erection of the name boards.

The Contractor will be permitted to erect a maximum of one of his own name boards, in positions approved by the Engineer. The Engineer reserves the right to order the removal of this board if they are not kept in good repair.

SD AB 5.5: Survey Assistants

Substitute "two or more suitably educated survey labourers" in the first sentence of AB 5.5 with "two semi-skilled labourers."

Add the following sub-clause to Clause AB 8.:

AB 8: PAYMENT

SD AB 8.2.2: Telephone, Fax machine, Photocopy machine, Survey Assistants, Equipment, etc.

No payment will be made in respect of the above-mentioned, and all the costs concerned will be deemed covered by the unit prices for the Contractors' facilities.

SANS C: SITE CLEARANCE

SD C 3: MATERIAL

SD C 3.1: Disposal of material

Substitute the first sentence of C 3.1 with the following:

"Material obtained from clearing and grubbing, demolition of concrete structures and brickwork, dismantling of pipes and removal of any items shall be disposed of off-site at a spoil site to be identified and procured by the Contractor. Materials qualifying for disposal on site will be spoiled and levelled where indicated by the Engineer. All transport costs shall be included in the rates tendered for site clearance."

SD C 5: CONSTRUCTION

SD C 5.1: Areas to be cleared and grubbed

Substitute the first sentence of C 5.1 with the following:

Only areas as directed by the Engineer shall be cleared and grubbed where necessary. The Contractor may proceed with clearing and grubbing after handing over of the site only in areas as approved by the Engineer. Measurement and payment for clearing and grubbing shall only occur for areas as required in writing by the Engineer.

Substitute the last paragraph with the following:

The Contractor shall program his work in such a way that re-clearing will not be necessary. The cost of re-clearing shall be borne by the Contractor.

SD C 5.2.3.2: Individual trees

Add the following to C 5.2.3.2:

Trees outside the construction area, channel and pipeline routes must be left standing and undamaged, except where otherwise ordered in writing by the Engineer.

SD C 5.6: Conservation of Topsoil

Add the following sentence to C 5.6:

All topsoil removed to a nominal depth of 150 mm shall be preserved for reuse and erosion thereof shall be prevented. Measurement and payment shall be in accordance to C 8.2.10.

Add sub clause C 5.9:

SD C 5.9: Topsoiling

Upon completion of construction, a 150mm thick topsoil layer from the stockpile shall be placed and watered until germination of natural seeds in the soil is achieved. Measurement and payment shall be in accordance to SD C 8.2.12.

C 8: MEASUREMENT AND PAYMENT

C 8.2: SCHEDULED ITEMS

Add the following payment items:

SD C 8.2.1: Clear and Grub in:..... Unit m² or m

The clearing operation will be divided into the areas specified in the bill of quantities and shall allow for the clearing all construction areas of all grass, weeds, shrubs, trees with trunks not exceeding 200mm girth, debris, etc., including grubbing up all roots, scoffing up as required and cart away all vegetation and debris.

For clearing along pipeline routes and fence lines, the contractor's rate shall allow for clearing of a 5m wide strip along the centreline of the pipeline route or fence line.

SD C 8.2.3: Remove and grub large trees and tree stumps of girth..... Unit: No.

The rate shall cover the cost to take out and remove trees of specified girth, including grubbing of roots, all excavations and backfilling as required and the cost of loading, transporting and dumping of the material at a dump site to be identified by the Contractor.

SD C 8.2.11: Breakup concrete and brick structures and dispose of materialUnit: m³

Measurement shall be made for the actual volume of the brick, mass concrete or reinforced concrete material removed, e.g. the volume of the walls and floors of manholes and concrete channels, the chlorination contact channel, concrete thrust blocks or any other unspecified structures on site.

The rate shall cover the cost of all excavation, demolition, the costs for precautions required during the demolition and excavations and backfilling as required, the cost of loading, transporting and dumping of the material at a suitable dump site to be identified by the Contractor and approved by the Engineer.

SD C 8.2.12: Remove and dispose of existing surfaces in patchesUnit: m²

a) Asphalt surface: The rate shall include saw cutting of the existing asphalt surface up to 40 mm thick, as well as restricted excavation by hand through the asphalt and underlaying layer works up to 300 mm, removal of the excavated material and spoiling thereof at an approved dump site to be identified by the Contractor and approved by the Engineer.

SD C 8.2.13: Remove and dispose of existing fence.....Unit: m

The rate shall include the cost to dismantle and remove existing wire fences of any type and construction with height as specified, including fence posts, and to dispose thereof at an approved dump site to be identified by the Contractor and approved by the Engineer.

SD C 8.2.14: Remove material from existing reed beds and spoilUnit: m³

The rate shall include the cost to remove all sludge, silt and other material from the existing reed beds downstream of the old septic tank, up to the in-situ invert level of the reed beds, and disposing thereof at an approved spoil site to be identified by the Contractor and approved by the Engineer (typically landfills site or wastewater treatment facility), including all transport and levies to spoil the material at the approved site.

D: EARTHWORKS

SD D 2: INTERPRETATIONS

SD D 2.1: Supporting Specifications

Replace subclause 2.1.2 with the following:

"SD D 2.1.2: Any of the other SANS 1200 specifications may form part of the contract documents."

SD D 2.3: Definition

Replace the definition "Borrow" with the following:

"Borrow material: Material, other than material obtained from excavations required for the works, obtained from sources such as borrow pits or the authorized widening of excavations. 'Borrow' shall have a corresponding meaning."

Replace the definition "Specified density" with the following:

"Specified density: The specified dry density expressed as a percentage of modified AASHTO dry density."

Replace the definition "Stockpile" with the following:

"Stockpile (Verb): The process of selecting and, as maybe necessary, loading, transporting and off-loading material in a designated area for later use and a specific purpose."

D 3.3 Selection

SD 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. Prior to commencing with earthworks, the Contractor shall make trial holes at positions and to depths ordered by the Engineer, to determine the area.

D3: MATERIALS

D 3.1: Classification for Excavation purposes

SD D 3.1.2: Classes of excavation

Add the following to D3.1.2:

For the purposes of measurement and payment in this contract, intermediate and boulder excavation are to be classified as soft excavation, Hard Rock remains as classified in this clause.

D 3.2: Classification for placing purposes

SD D 3.2.1: Material suitable for embankments and terraces

Add the following to D 3.2.1:

Boulders may be used in fill for embankments, provided that no voids result and that the material around the boulders is compacted to the required density containing unsuitable material that is to be spoiled.

D4 PLANT

D5: CONSTRUCTION

D 5.1 Precautions

SD D 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 commencing with construction. After locating the exact position of services 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 record drawings.

SD D 5.1.2.3 Protection of Cables

Substitute "estimated position" in the second sentence of D 5.1.2.3 with "actual or exposed position".

SD D 5.1.4.1 : Dust nuisance

Add the following to D 5.1.4.1:

The Contractor is responsible for dust control and is responsible for all claims which may arise from dust disturbance from the date of site handover to the date of completion of the contract. No payment will be made in respect of the above mentioned and all costs will be deemed as covered by the tendered rates.

SD D 5.1.6: Road traffic control

Add the following to D 5.1.6:

- a) Sufficient road signs must be erected in such a way that motorists are warned well in advance of works, e.g. at the closing of a street sufficient signs to direct traffic must be erected at the preceding intersection.
- b) Bypasses and/or road signs shall be provided and/or erected at all locations where the free flow of traffic is obstructed and shall be approved by the Engineer before the commencement of construction. Where main roads are crossed, detours and temporary traffic signs must be provided.
- c) Where a trench crosses a street or wherever a trench crosses the direction of traffic flow, drums must be placed in the street, and not just along the sides of the street, with warning tape in between.
- d) Drums shall be painted white and provided with retro-reflective warning tape between and around

them.

- e) Drums shall be kept in position with ballast of sand or soil. Stones shall not be used for this purpose. The spacing of drums must be in such a way (maximum 5 m) that they are visible from all directions.
- f) Sufficient safety measures must be utilised for pedestrians.

D 5.2: Methods and Procedures

SD D 5.2.2.3: Disposal

Substitute the second sentence of D 5.2.2.3 with the following:

All surplus and unsuitable material shall be dumped and neatly finished off to the levels as instructed by the Engineer at the dump site which is to be identified by the Contractor, and agreed to by the Engineer.

SD D 5.2.2.4 Excavation by hand around existing services

Where hand excavation is required around existing services it shall be done within 3,0 m above and on both sides of cables and within 500 mm above and on both sides of pipes, as well as underneath the services.

D 5.2.3: Placing and Compaction

SD D 5.2.3.2: Backfilling and Filling against structures

Add the following to D 5.2.3.2:

"After construction of the structures, backfilling and compaction of material against the structure shall commence as follows

- a) General: Selected backfill material, free of rocks or rubble larger than 300mm in diameter, shall be placed in layers of maximum thickness 500mm, and each layer shall be compacted to 90 % Mod AASHTO.
- b) Restricted: Restricted backfill material, free of rocks larger than 150mm in diameter, vegetation matter or other rubble, shall be placed in layers of maximum thickness 300mm, and each layer compacted to 90 % Mod AASHTO.

The tendered rates shall include all costs for selecting and loading from stockpiles, hauling, backfilling, spreading and compacting material as applicable."

SD D 5.2.8: Imported Materials

The imported fill material shall be similar to the sandy material on site.

D 8: MEASUREMENT AND PAYMENT

D 8.3: Scheduled items

SD D 8.3.2: Bulk Excavation

- a) Excavate in all materials and use for embankment or backfill or dispose, as ordered
Unit: m³

Add the following to D 8.3.2 (a):

Payment shall be irrespective of the depth of excavation. No differentiation shall be made between material containing rubble and material not containing rubble.

No payment shall be made for stockpiling of imported fill material where such stockpiling is necessitated by non-removal of unsuitable material.

SD D 8.3.2(b): Extra over for

5) Hard rock excavation (methods other than blasting) Unit: m³

This payment item shall be for hard rock excavation by methods other than blasting.

SD D 8.3.3: Restricted Excavation Unit: m³

(a) Excavate for restricted foundations and footings in all materials below bulk excavation line, separate from general backfill and stockpile and maintain for backfill

Add the following to D 8.3.3 (a):

"Excavation and trimming of remaining 75mm beyond bulk excavation line to neat profiles in all materials. Over- excavation shall not be paid for, unless specifically directed by the engineer.

The rate shall cover all costs for excavation in trimming to neat profiles, costs due to excavation and disposal of material described in SD D 5.2.2.3.

Payment shall be for the cubic metre of excavation beyond the bulk excavation line."

SD D 8.3.4: Importing of materials

Add the following payment item:

a) Extra over for importation of materials from commercial sources or from Borrowpits Unit: m³

The rate shall cover all additional material, labour and plant costs for the supply from a commercial source in addition to SD D 8.3.2 and SD D 8.3.3.

D 8.3.8: Existing Services

SD D 8.3.8.1: Location

SD D 8.3.8.1 b) The use of specialist equipment for detection Unit :Hour

Add the following to D 8.3.8.1(b):

The rate shall cover the cost of lease of equipment, supply and deliver of all material and labour necessary for the detection of the existing services once only, as well as for operating the equipment.

The rate shall also cover all costs for labour and equipment to determine the position, direction, level and diameter of the service. This information must be indicated on the "as-built" drawings.

SD D 8.3.8.1 c) Excavate by hand in soft material to expose services Unit : 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. The rate shall include the required backfilling and compaction.

SD D 8.3.9: Backfill of Material from Maintained Stockpiles Against Structure **Unit : m³**

- a) Restricted backfill of soil from stockpile against structures constructed under ground level and compact in layers as specified in SD D 5.2.3.2.

DB EARTHWORKS (PIPE TRENCHES)

SD DB 3.1: Classes of excavation

Add the following to DB 3.1:

For the purposes of measurement and payment in this contract, intermediate and boulder excavation are to be classified as soft excavation. Hard Rock remains as classified in this clause.

SD DB 3.5: Backfill Materials

- a) *Substitute "from trenches" in DB 3.5(a) with "from trenches, channels or street excavations".*

Add the following to DB 3.5.

- b) All pipe trenches underneath the roadway must be backfilled with sand of upper selected layer quality compacted to 100% of the modified AASHTO maximum density. Sand is defined as non-plastic material and complies with the following sieve analysis:

% passing 4.740 mm sieve 95% minimum
0.425 mm sieve 50% minimum
0.075 mm sieve 10% maximum

Add the following to DB 3.5(b):

- c) All pipe trenches in street reserves shall be classified as areas subject to loads from road traffic.
- d) All pipe trenches underlying or adjacent to the carriageway shall be backfilled with sand complying with the requirements for A3 materials, as specified in SD DB 2.3.

DB 3.6: Materials for reinstatement of roads and paved areas

SD DB 3.6.1: Subbase and Base

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, new material complying with the requirements of SANS 1200 MF shall be used for 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 SANS 1200 ME.

SD DB 3.7: Selection

Add the following to sub clause DB 3.7:

The Contractor shall deal selectively with material from general excavation. Any material 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 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.

Prior to commencing with earthworks, the Contractor shall make trial holes at positions and to depths

ordered by the Engineer, to determine the area containing unsuitable material that is to be spoiled.

SD DB 3.8: Geotextiles for unstable trench-bottom conditions

The following products are acceptable: KaymatU24, BidimB4, IndustexS210.

Alternatives may be submitted to the Engineer for approval.

DB 4: PLANT

SD DB 4.1: Excavation equipment

Add the following to DB 4.1:

All excavations exceeding the specified widths, shall be backfilled with approved selected material. No payment shall be made for this and all relevant costs shall be deemed to be included in the tendered rates.

DB 5: CONSTRUCTION

SD DB 5.1: Precautions

SD DB 5.1.: Stormwater, seepage and dewatering of excavations

The Engineer may instruct the Contractor to place a layer of crushed stone bedding (150 mm minimum thickness) on the bed of the trench. If the conditions remain unstable due to the condition of the material and degree of saturation, the Engineer may instruct the Contractor to place a geotextile membrane underneath the layer of crushed stone.

After placement of the stone bedding, geotextiles must be folded over with a minimum overlap of 300 mm to form a closed subsoil drain. The crushed stone bedding and geotextile will only be measured when instructed in writing by the Engineer.

SD DB 5.1.3 Accommodation of Traffic and Access to Properties

Add the following to DB 5.1.3:

Detour and road traffic signs must be in accordance with "CSRA-CUTA : Road Traffic Signs Sub-Committee; Road Signs Note No. 13" and the "Suid-Afrikaanse Handleiding vir Padverkeerstekens" or any amendments thereof and must be approved by the Engineer before commencement of construction.

Where steel drums are being used as barricades they must be filled with sand or soil. Rocks may not be used for this purpose or be stacked on top of drums. Drums must be white washed with danger tape put up between and tied around the drums

SD DB 5.1.4.1 Crossing of the Irrigation earth channel

The following will apply for the crossing of the irrigation channel:

- a) direct liaison and negotiation, at least 2 (two) weeks before construction commences, with the relevant authorities with regard to the programming of the work;
- b) usable material from the excavation of the crossing is to be selected and stockpiled for re-use;
- c) the water must be dealt with during construction in order to keep the canal in operation;
- d) dewatering of excavations to be done before and during crossing if necessary;
- e) the water pipe shall be laid according to the levels indicated on the relevant drawing;

- f) sand compacted to 100% of MAASHTO density shall be used to backfill the trenches.
- g) On completion of the pipe installation the earth channel must be reinstated to its original state and alignment.

SD DB 5.1.4.2 Crossing of the concrete irrigation channel

The following will apply for the crossing of the concrete irrigation channel:

- a) direct liaison and negotiation, at least 2 (two) weeks before construction commences, with the relevant authorities with regard to the programming of the work;
- b) If tunneling underneath the channel is not possible the required section of the channel should be removed and reinstated after construction.
- c) usable material from the excavation of the crossing is to be selected and stockpiled for re-use;
- d) the water must be dealt with during construction in order to keep the canal in operation;
- e) dewatering of excavations to be done before and during crossing if necessary;
- f) the water pipe shall be laid according to the levels indicated on the relevant drawing; sand compacted to 100% of MAASHTO density shall be used to backfill the trenches;
- g) The concrete channel must be reinstated to its original alignment and works due to include all material, plant and labour to complete the reinstatement;
- h) Joining of the new channel section to the existing must include bonding agents to supplier's specifications.

SD DB 5.1.4.3 Crossing of brick paved and asphalt roads and entrances

The following will apply for the crossing:

- a) direct liaison and negotiation, at least 2 (two) weeks before construction commences, with the relevant authorities with regard to the programming of the work;
- b) construction must be done in half widths, backfilled completely and the surface reinstated before the next half is done in order to accommodate the traffic flow;
- c) the necessary detours and temporary traffic signs shall be supplied;
- d) the bituminous surface must be cut in a straight line (not stepped), perpendicular to the road edge to ensure a neat finish;
- e) usable material from the excavation of the crossing is to be selected and stockpiled for re-use;
- f) dewatering of excavations to be done before and during crossing if necessary;
- g) the water pipe shall be laid according to the levels indicated on the relevant drawing;
- h) sand compacted to 100% of MAASHTO density shall be used to backfill the trenches up to the pavement layers;
- i) the subbase and base materials shall be approved imported materials of the same quality and thickness as that of the existing material;
- j) the paved surface must be reinstated to the same quality and thickness as that of the existing material.

SD DB 5.1.4.4 Crossing of in-situ cast irrigation pipe

The following will apply for the crossing of in-situ cast irrigation pipe:

- a) direct liaison and negotiation, at least 2 (two) weeks before construction commences, with the relevant authorities with regard to the programming of the work;
- b) If tunneling underneath the pipe is not possible the required section of the pipe should be cut out and removed.
- c) the water must be dealt with during construction in order to keep the canal in operation;
- d) dewatering of excavations to be done before and during crossing if necessary;
- e) the water pipe shall be laid according to the levels indicated on the relevant drawing;

- sand compacted to 100% of MAASHTO density shall be used to backfill the trenches;
- f) The concrete pipe must be replaced with a 1200mm diameter precast concrete pipe measured separately in the BoQ. The works due to include all additional material, plant and labour to complete the reinstatement;
 - g) Joining of the new pipe section to the existing must include bonding agents to supplier's specifications.

SD DB 5.2: Minimum base widths specified

Substitute paragraph (b) of DB 5.2 with the following:

The minimum base width for all pipes with a diameter less than 125 mm shall be 600 mm plus the outside diameter of the pipes, irrespective of the depth at which they are laid, except for subsurface drains where the width shall be 400 mm and for house water connections where the width shall be 300 mm.

A bedding layer is required for all pipes with a diameter less than 125 mm, except for subsurface drains.

The minimum base width for Telkom and electric cable ducts shall be 500 mm.

SD DB 5.4: Excavation

Add the following to DB 5.4:

Excavation and backfilling of pipe trenches on sidewalks in the residential area shall be done in such a way as to ensure the least possible disruption to the public and entrances to properties. No additional payment shall be made for this and all relevant costs shall be deemed to be included in the tendered rates.

SD DB 5.5: Trench bottom

Substitute "90%" in the second paragraph of DB 5.5 with "93% (100% for sand)".

SD DB 5.6: Backfilling

SD DB 5.6.2: Material for backfilling

Substitute "from trench excavations" in the first paragraph for DB 5.6.2 with "from trench, channel, road reserve or other excavations on the site of works".

Add the following:

All trenches underlying or adjacent to streets shall be backfilled with sand compacted to 100% of Mod AASHTO density, to the bottom of the subbase.

SD DB 5.6.3: Disposal of Soft Excavation Material

Add the following to DB 5.6.3:

All surplus and unsuitable material as described in DB 5.6.3 shall be disposed of at the spoil site, (as described in SD D 5.2.2.3) and levelled off.

DB 5.7: Compaction

SD DB 5.7.2: Areas subject to traffic loads

Add the following to DB 5.7.2:

All pipe trenches that fall in the street reserves, will be regarded as areas subject to traffic loads.

Sand backfilling shall be compacted to 100% of Mod.AASHTO density.

DB 5.9Reinstatement of surface

SD 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 specifications for this contract.

DB 8: MEASUREMENT AND PAYMENT

SD DB 8.1: Basic principles

Delete "along the route of the pipeline" in DB 8.1.1.

DB 8.2: Computation of quantities

SD DB 8.2.4: Shoring

Add the following to DB 8.2.4:

No payment will be made in respect of this and all costs will be deemed as covered by the rate for excavation. Shoring will only be measured and paid for if written approval is given by the Engineer before it is installed.

DB 8.3: Scheduled items

SD DB 8.3.2: Excavation

SD DB 8.3.2 (a): Excavate in materials for trenches, backfill, compact and dispose of Surplus material Unit : m

Add the following to DB 8.3.2 (a):

The depth of excavation in street reserves shall be measured from the final finished level of the road reserve profile to the invert level of the bedding material.

The rates for trench excavation must also include any actions needed to deal with any water in the excavations, as well as loading and transportation of surplus material to a spoil site, spoiling and compacting the material to 90% (100% for sand) of Mod AASHTO at a spoil site as described in SD D 5.2.2.3. The backfill material must be compacted to 93% of Mod AASHTO (100% for sand) in all backfilling of trenches.

The rate for excavation for subsurface drains shall cover the costs of excavation and spoil of surplus material and the supply of suitable free draining sand to be placed directly above the geotextile up to 200mm below the final surface levels.

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

For duct excavations the tender shall refer to the section where all the types, diameters and pipe combinations are listed to determine trench width and depth detail.

The rates are to allow for excavation in the classes of material as referred to in SD D 3.1.2 as well as excavation and disposal of unsuitable material from the trench bottom. There will be no extra-

over payment in terms boulder and intermediate excavations, but only for hard hard-rock excavation where agreed by the Engineer.

Add the following to DB 8.3.2 (b):

SD DB 8.3.2(b): Extra over for

In accordance with SD DB 3.1, all classes of excavation will be paid for under item SD DB 8.3.2 (a), except for intermediate and hard rock that will be paid for under this item.

- | | | |
|----|---|-----------------------------|
| a) | Hard rock excavation (Blasting) | Unit : m³ |
| b) | Hard rock excavation (methods other than blasting) | Unit : m³ |

This payment item shall be for hard rock excavation by methods other than blasting.

SD DB 8.3.2(c): Excavate unsuitable material from trench bottom **Unit : m³**

Delete "and the disposal" in the heading of DB 8.3.2 (c) and in the last paragraph.

SD DB 8.3.2(d): Hand excavation and backfill **Unit : m³**

The provisions of DB 8.3.2(a), DB 8.3.2(b) and DB 8.3.2(c) shall apply mutatis mutandis for hand excavation.

Payment shall only be made if so ordered by the Engineer.

SD DB 8.3.2(e) Extra-over SD DB 8.3.2(a) for temporary stockpiling of material **Unit : m³**

Temporary stockpiling of material will only be measured and paid for if ordered so in writing by the Engineer and if it is not contaminated with unsuitable material.

The rate shall provide for the handling and stockpiling of the material within the free haul distance.

SD DB 8.3.2(f) Extra-over item SD DB 8.3.2(a) for restricted excavation for pipe trenches in all materials and use for backfilling, fill or disposal **Unit : m³**

Restricted excavation will be measured and paid as an extra over ordinary excavation in cases where the work space is insufficient to place excavated material alongside the trench, and some or all excavated material has to be temporary removed.

Restricted excavation will only be paid when approved in writing by the Engineer.

Restricted excavation will be measured and paid where work space problems occur whether shoring is installed in the trench or not. Where no shoring is installed, the natural slope of the in-situ and excavated material as contained in SANS 0120 Part 5 DB 3.1.3 will be considered when determining the available space for placing the excavated material.

Should excavated material be unsuitable as backfill material and has to be removed, then no restricted excavation will be measured and paid, but payment will be made under the item for the removal of unsuitable material.

Measurement and payment for restricted excavation will only be made according to the nominal trench excavation and not the volume of excavated material. The rate for restricted excavation must allow for trench walls that collapse where no shoring is installed. The rate must also allow for handling excavated material twice, load, transport, off-load, temporary storage and/or stockpiling, load, transport back to the required position and off-load/placing.

Restricted excavation will be paid according to the discretion of the Engineer in cases where there is enough space for excavated material, but not enough space to place pipe material directly next to the trench.

No overhaul will be measured or paid and all haulage will be regarded as freehaul.

Restricted excavation will be measured according to the percentage of the nominal trench excavation that needs to be removed.

The stipulations of Clauses DB 8.3.2(a), DB 8.3.2(b) and SD DB 8.3.2(c) shall apply mutatis mutandis.

**SD DB 8.3.2(g) Extra-over item SD DB 8.3.2(a) for hand excavation and backfill
 around existing services Unit : m³**

Hand excavation around existing services as described in SD D 5.2.2.4 will be measured as an extra over machine excavation. The rate must include the standing time cost of the machine while hand excavation around the service is executed.

DB 8.3.3: Excavation Ancillaries

SD DB 8.3.3.1: Make up deficiency in backfill material (provisional) Unit : m³

Add the following to DB 8.3.3.1:

d) Stockpile Unit : m³

Add the following to the last paragraph of DB 8.3.3.1:

No payment will be made for the transport of material from commercial sources or sources outside the site that the Contractor has selected. Stockpiling of material will only be paid when approved in writing by the Engineer.

SD DB 8.3.4 PARTICULAR ITEMS

SD DB 8.3.4 a) Shore a trench opposite structure or service Unit : m

Add the following to DB 8.3.4(a):

Separate items shall be provided for shoring on both sides and on one side of trenches.

The tendered rate shall allow for additional excavation for shoring as well as for the design of effective shoring.

SD DB 8.3.4 b) Temporary works : Control water inflow

Substitute DB 8.3.4(b) with the following:

- 1) Provide equipment Unit : Set
- 2) Operate and maintain Unit : Set days
- 3) Remove equipment Unit :
Set
- 4) Remove, move and reinstall existing sets of equipment Unit :

Set

The rate for (1) above shall cover the cost of providing the necessary plant and materials, fully erected and operative on site for a set of equipment as described in SD DB 4.4.

The rate for (2) above shall cover the cost of operating and maintaining the pumps, well points sheeting, close lumbering and other equipment, as applicable, for 24 hour a day. The amount of days allowed for shall be the accumulated amount of set days of all sets. Pro-rata set days will be measured where a set is not used and maintained for a full 24 hour day. The set shall be in operation 24 hours a day from installation till removal to be measured and paid for otherwise no payment shall be made.

DB 8.3.5: Existing services that intersect or adjoin a pipe trench

SD DB 8.3.5 (a): Services that intersect a trench

Unit : 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 trunk services and existing erf connection.

The rate shall also allow for the cost of the following:

- (i) Sufficient photo's of existing services being taken 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.
- (ii) Reinstatement of existing services damaged by the Contractor.
- (iii) Reinstallation of services which were removed by the Contractor.

SD DB 8.3.5 (b): Services that adjoin a trench

Unit : no or m

Add the following to DB 8.3.5 (b):

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

The cost for shoring shall be deemed as covered by the listed items and no additional payment will be made for this.

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

Existing services that rest directly on the ground e.g. poles, trees, walls and structures are handled in the same way as underground services, but the axis of the services 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 horizontal axis will be at the point where the structure and the natural ground level intersects. 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 adjoining.

If the structure, according to the abovementioned does not qualify as an adjoining service but the foundation of the structure is such that if a 45° line drawn from the nearest bottom corner thereof cuts through the excavation, the structure will be measured as an adjoining service if approved by

the Engineer.

If there is more than one service adjoining the same trench and such a service is on the same side of the trench, payment will only be made for the nearest service to the trench, or if they are the same distance from the trench for the top one. The maximum number of services that will be paid for, is therefore one on each side.

G: CONCRETE (STRUCTURAL)

SD G 3: MATERIAL

SD G 3.2: CEMENT

SD G 3.2.1: Applicable Specifications

Replace G 3.2.1 with the following:

Concrete with the minimum and maximum cement contents of 325 kg/m³ and 400 kg/m³ respectively shall be used. For concrete containing PFA the maximum cementitious content shall be 450 kg/m³. The water cement ratio shall not exceed 0.50. All concrete mix designs shall be approved by the Engineer in advance. Strength of concrete is as shown on the drawings.

The mix design and casting procedure shall be approved by the Engineer prior to casting.

Portland Cement I5FA ("PC I5FA") compliant with the requirements of SANS 831 can be used. The fly-ash cement obtained by blending of the OPC and Pulverised Fly Ash (PFA) shall comply with the requirements of SANS 1466-1988. No other types of cement (e.g. Rapid Hardening Cement, Portland Blast furnace Cement) may be used. If aggregates to be used in this contract are alkali-reactive, the OPC used on this Contract shall not have an alkali content $Na_2O + 0,656K_2O$ which exceeds 0.6% by mass of the cement. For the cement used in conjunction with the selected additional aggregates the alkali content per cubic metre of concrete shall not exceed 2,1kg. The Contractor shall submit the necessary test results to prove the above.

Add the following to G 3.2.1:

"In accordance with the new SANS, all Portland cement (OPC or RH) shall be in accordance with SANS ENV 197-1 (CEM II) except for non-structural concrete where CEM I 32.5 is acceptable. Pulverized fly ash (PFA) shall conform to the requirements of SANS 1491-2."

SD G 3.2.2: Alternative types of cement

Replace the contents of G 3.2.2 with the following:

Only ordinary Portland cement (OPC) may be used. Should the Contractor wish to use any other type of cement, he shall obtain the Engineer's prior written approval (see G 8.1.3.2 and 8.1.3.3).

SD G 3.2.3: Storage of cement

Add the following to G 3.2.3:

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

SD G 3.4: AGGREGATES

SD G 3.4.1: Applicable Specification

Replace G 3.4.1 with the following:

The stone size for all concrete shall be as shown on the drawings.

The maximum water absorption of the coarse aggregate shall not exceed 1% and the flakiness index shall not exceed 25%. The maximum water demand of the fine aggregate shall be 190 l/m³ and the aggregate shall comply with the requirements of SANS 1083.

Aggregates to be used in this contract shall be tested in accordance with subsection C-15 of SANS 1083 to determine whether they are potentially alkali-reactive. If they are alkali-reactive they shall

either be replaced with aggregates that are non-reactive. The fineness modulus of the sand must be between 1,7 and 2,8 with a standard deviation of not more than 0,1.

At tender stage the Contractor shall assure himself by means of tests and test mixes by an accredited laboratory that the fine and coarse aggregates that he intends to use comply with the specification. The tendered rates shall therefore be deemed to allow for the importation of aggregates that do comply with the Specification.

The Contractor shall be responsible for locating the sources of all aggregates.

SD G 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.

Add the following new sub-clause to G 3.5:

SD G 3.5.3: Mixing Water

Only potable water shall be used for mixing water.

SD G 4: PLANT

SD G 4.3.1: General Requirements for Mixing Plant

Add the following to sub-clause G 4.3.1:

All concrete shall be weight batched.

SD G 4.4: VIBRATORS

Add the following to clause G 4.4:

All concrete shall be compacted by vibrators and a spare vibrator in working order shall be available on Site for use at all times.

SD G 4.5: Formwork

SD G 4.5.3: Ties

Add the following to G 4.5.3:

Form work ties in water-retaining structures shall be of the 12mm Extended Coil Tie with Water-Bar-type of Form-scaff. No ferrules or ferrule pipes may be used in structural elements of water-retaining structures. The Contractor shall allow in his rates for the specified formwork ties and ensure that his formwork is compatible with these ties.

After removal of plastic cones from concrete, the openings in the concrete shall be made rough with a mechanical wire brush. Thereafter the openings shall be painted with cement mortar and filled with a shrinkage-free grout such as "M Bed Standard" from Sternson or a similar approved non-toxic product compatible with the chemicals used in the water. The grout filling shall be applied in such a way as to protect the ties against corrosion.

SD G 5: CONSTRUCTION

SD G 5.1: REINFORCEMENT

SD G 5.1.2: Fixing of reinforcement and spacer-blocks.

Add the following to clause G 5.12:

The welding of reinforcement steel is not permitted.

Spacer-blocks must be of an approved design.

Where mortar blocks are used, they must be properly shaped so that they do not slip out of position and they must be made of the same mortar mix as the concrete into which it is cast. The mortar must be compacted by using approved methods in order to give blocks that have a density of at least 2 300 kg per m³ and that are free of honey-combing. They must be cured in water for at least 7 days.

SD G 5.1.3: Cover

Replace G 5.1.3 with the following:

The minimum concrete cover for water-retaining and non-water retaining structures are indicated on the drawings.

The cover blocks for water-retaining structures shall be made of 30 MPa/13 mm concrete using "PC 15FA" cement. The size of the cover blocks shall be 50mm x 50mm, with a thickness equal to the specified cover. Wires shall be cast into the blocks to enable them to be fixed to the reinforcement. The concrete shall be thoroughly compacted and the blocks shall be protected against early drying and shrinkage due to sun and wind, by frequent wetting while still in the mould. After the blocks have been removed from the mould they shall be kept in water until used.

SD G 5.1.4: Splicing

Add the following to G 5.1.4:

Splice lengths for water-retaining structures shall not be less than 45 diameters and in non-water-retaining structures not less than 40 diameters. Where applicable in water-retaining structures, splices shall be staggered so that they are evenly spread throughout the structure.

SD G 5.2: FORMWORK

SD G 5.2.1: Classification of finishes

Add the following to clause G 5.2.1(b):

Wherever it is indicated on the drawings, exposed concrete surfaces above final ground level and inside the valve chambers and pump building must have a smooth surface finish. The forms used shall be unblemished and the panels regular. In the case of circular surfaces to be formed, a "Flexform system" or similar approved curved formwork system shall be used. Joints shall be a feature of the pattern and shall be handled with care. The finished concrete shall be accurate to Degree of Accuracy II. After removing the formwork, the surfaces must receive no after-treatment except in the positions of the formwork anchor bolts. These must be placed in a regular and precise pattern.

Add the following sub-clauses to G 5.2.1:

c) Special off-shutter finish

The special off-shutter finish is applicable to all visible concrete. Form work panels shall be made of steel panels. Approved laminated wooden board inserts to steel framed panels shall only be used in confined places and the use thereof will be subject to approval by the

Engineer. The panels shall be free from rust, ridges, fins, bulges, imperfections, irregularities, air bubbles, honeycomb or surface discolourations. Grout checks and chamfers shall be used at all construction joints and corners.

Joints between panels shall be sealed tightly to prevent local honeycombing or leaching of concrete. Joints between panels shall form straight horizontal and vertical lines which shall be spaced evenly on the formed concrete surface, and shall be even and smooth and require minimal or no finishing. The layout of all form work panels and construction joints shall be discussed with the Engineer before application, and approved in writing.

d) Finish on blinding layers

A blinding layer or 15 MPa/13mm concrete with a minimum thickness as shown on the drawings shall be used.

e) Concrete finish

All unformed concrete to have a wood-floated finish unless indicated different on the drawings.

f) Visible corners

Visible corners shall have a 25mm x 25 mm chamfer. No additional payment will be made for this and it will be deemed to be included in the tendered rates.

g) Smooth Finishes

Wherever it is indicated on the drawings, exposed concrete surfaces above final ground level and inside the valve chambers and pump station building must have a smooth surface finish. The forms used shall be unblemished and the panels regular. Joints shall be a feature of the pattern and shall be handled with care. The finished concrete shall be accurate to Degree of Accuracy II. After removing the formwork, the surfaces must receive no after-treatment except in the positions of the formwork anchor bolts. These must be placed in a regular and precise pattern.

SD G 5.2.5: Removal of Formwork

Add the following to sub-clause G 5.2.5:

The Contractor shall make provision for the continued support of beams and slabs while the formwork is being removed and/or for back propping of beams, slabs, etc. The propping may be required simultaneously on more than one level directly underneath one another. The requirements for continuous propping and/or back propping shall be calculated to a theoretical model that is acceptable to the Engineer, and details shall be submitted for the Engineer's approval. Data required for such calculations, e.g. design loads and structural dimensions, will be supplied by the Engineer on request.

Add the following new sub-clause to G 5.2:

SD G 5.2.6: Chamfers and Fillets

All internal and external corners in the concrete must be formed with chamfers or fillets, except where otherwise specified or instructed. This requirement is normally not shown on drawings. This item shall not be measure and paid separately and the costs thereof shall be allowed for in the formwork rates.

SD G 5.3: HOLES, CHASES AND FIXING BLOCKS

Add the following to clause G 5.3:

Fixing blocks and fixtures may be embedded in concrete, provided that the strength or any other desirable feature (such as the appearance of the member) is not, in the opinion of the Engineer, impaired thereby.

SD G 5.5: CONCRETE

SD G 5.5.1.3: Workability

Replace G 5.5.1.3 with the following:

The workability range for all PFA concrete (slump) shall be between 60mm and 90mm for a pump mix and between 50mm and 60mm for a non-pump mix.

SD G 5.5.1.5: Durability

The exposure conditions for concrete are classified as "Severe".

Replace G 5.5.1.5 with the following:

The maximum water/cement ratio for moderate sections, general reinforced concrete, exterior portions of mass concrete, as well as for internal concrete in buildings under conditions of moderate exposure, is 0,50.

The maximum water/cement ratio for concrete slabs on the ground under very severe conditions, is 0,45.

SD G 5.5.1.7: Strength concrete

Add the following to sub-clause G 5.5.1.7:

- c) Due to the design approach and assumptions adopted for this Contract, it is of the utmost importance that good strength concrete with consistent quality and composition is used throughout. All possible measures to limit shrinkage shall be applied.
- d) In addition to the requirement that the Contractor design the mixes to the specified strengths, the cementitious material content shall be within the limits of 325 kg/m³ to 400 kg/m³ for Strength 35MPa reinforced concrete. For concrete containing PFA the maximum cement content shall be 450 kg/m³.
- e) All concrete shall be based on designed mixes. Trial mixes shall be made by an approved laboratory with suitable experience in the design of PFA concrete mixes. No concrete shall be cast before the design mix and casting procedures has been approved by the Engineer. The Engineer may at any time request that the concrete mix must be revised.

Add the following new clause to G 5.5.1:

SD G 5.5.3.2: Ready-mixed concrete

Add the following to G 5.5.3.2:

The use of ready-mixed concrete for this Contract will only be permitted if adequate proof of quality control for the specific design mix can be provided to the Engineer.

SD G 5.5.5: Placing

Add the following to sub-clause G 5.5.5.1:

The Contractor shall give the Engineer at least 24 hours notice of his intention to cast concrete.

Add the following to sub-clause G 5.5.5.5:

Concrete in water-retaining structures shall not be allowed to fall freely through a height of more than 2.4m. This implies that walls in these structures may not be cast in lifts of more than 2,4m in height.

SD G 5.5.7: Construction Joints

Add the following to sub-clause G 5.5.7.1:

Construction joints may only be placed where shown on drawings. Should the Contractor wish to deviate from the Engineer's placement of the construction joints, he shall indicate his positioning of the construction joints on the drawings before construction work commences and submit these to the Engineer for comment and approval.

SD G 5.5.8: Curing and Protection

Add the following to this clause:

a) Floor and wall footings

Abovementioned structural elements shall be protected with approved plastic sheets that comply with the requirements as specified below immediately after the prescribed surface finishing has been completed. When the concrete has gained sufficient strength to prevent damage to the surface thereof, the plastic sheets shall be removed on a regular basis to allow the application of more water to the concrete to ensure that it is kept moist continuously. Plastic sheets shall be reinstalled after each wetting of the concrete. The curing period shall be at least 10 days.

b) Wall and columns

Structural elements other than horizontal elements, such as walls, columns etc shall be thoroughly sprayed with water immediately after the removal of form work. Immediately after this the concrete shall be covered with approved plastic sheets. These shall be removed on a regular basis to allow the application of more water to the concrete to ensure that it is kept moist continuously. Plastic sheets shall be reinstalled after each wetting of the concrete. Abovementioned shall be cured by means of this method for at least 10 days.

Plastic sheets used for curing shall be waterproof and may not be torn or otherwise discontinuous. It shall be white or lightly coloured. Black or other dark coloured plastic sheets shall under no circumstances be allowed. Sheets shall be held down or fixed securely to the elements being cured and joints in sheets shall be taped to prevent loss of moisture from the concrete. Care shall be exercised to prevent staining of exposed concrete.

Notwithstanding the preceding specifications, the Contractor shall also ensure that the concrete shall not be exposed to thermal shocks during the first 28 days after casting and he shall take the necessary, additional precautionary measures to shield the concrete with plastic sheets or hessian during extreme warm, cold or windy weather conditions. Hessian shall be wetted should the conditions necessitate this. Curing methods shall be such that saturation and subsequent damage to soil foundations is prevented. The Contractor shall make allowance in his rates for the abovementioned curing methods.

SD G 5.5.10: Concrete Surfaces

Add the following to sub-clause G 5.5.10.2:

(a) Wood-floated Finish

When a wood-floated finish is specified, the surface shall first be treated as specified in sub-clause 5.5.10.1, and after the concrete has hardened sufficiently, it shall be floated to a uniform surface free from trowel marks. The levelled surface shall be wood floated either by hand or by machine only, to remove trowel marks.

(b) Steel-floated Finish

When a steel-floated finish is specified, the surface shall be treated as specified for a wood-floated finish above, except that when the bleed water has disappeared and the concrete has hardened sufficiently to prevent the migration of concrete foam to the surface, the levelled surface shall be floated with a steel trowel on which a firm uniform pressure shall be applied to provide a dense, smooth, uniform surface of high quality free from trowel

marks.

SD G 5.5.13: Grouting

Add the following to replace G 5.5.13:

SD G 5.5.13.1: Materials

SD G 5.5.13.2: Water

Water for grout shall comply with the requirements given in Sub-clause 3.3 of SANS 1200 G.

SD G 5.5.13.3: Aggregates

Notwithstanding the requirements of Sub-clause 3.4.1 of SANS 1200 G, the grading of fine aggregate (sand) and coarse aggregate (stone or pea gravel) shall conform to the gradings given in Tables 1 and 2, respectively, hereafter.

SD G 5.5.13.4: Cement

Cement shall be ordinary Portland cement complying with the requirements of SANS 471.

SD G 5.5.13.5: Admixtures

Admixtures shall comply with the requirements of Sub-clause 3.5 of SANS 1200 G and shall have a proven record of satisfactory performance. All admixtures to be approved by Engineer.

SD G 5.5.13.6: Proprietary grouting materials

Unless otherwise approved by the Engineer, proprietary grouting materials shall be obtained ready mixed in sealed pockets as supplied by the manufacturers

Table 1

1	2
Test sieve nominal aperture size, mm	% Passing (by mass)
9.5	100
4.75	95-100
1.18	46-65
0.3 9 (300 um)	5-15
0.15 (150 um)	0-5

Table 2

1	2
Test sieve nominal aperture size, mm	% Passing (by mass)
9.5	100
4.75	95-100
2.36	0-5

SD G 5.5.14: Defects

Add the following sub-clause G 5.5.14.1:

The method of repair of defects in the concrete shall be by approved epoxy primer, epoxy and filler applied strictly according to the manufacturer's specifications or such other methods acceptable to the Engineer. Cementitious mortar may not be used for such remedial works. All repair materials shall be of an equivalent thermal and structural elasticity to concrete.

Add the following new sub-clauses to G 5:

SD G 5.6: JOINTS

SD G5.6.4: Construction Joints in the Walls (Horizontal)

This clause is to be read in conjunction with G 5.5.7. Construction joints in the walls are permitted.

Allowable positions of these joints are shown on drawings or shall be to the approval of the Engineer.

The payment unit shall be for the linear metre. The tendered rate shall include supply and installation of the sealant and the forming and preparation of concrete at the joint as per detail drawings.

SD G 6: TOLERANCES

SD G 6.1: BASIS OF MEASUREMENT

SD G 6.1.1: General

A Degree of Accuracy II shall apply in general, except for smooth shuttering (exposed wall and inside valve chambers) which must have a Degree of Accuracy I.

SD G 6.2: PERMISSIBLE DEVIATIONS

SD G 6.2.3: Specified permissible deviations

Add the following to G 6.2.3:

Degrees of Accuracy shall apply as specified in SD G 6.1.1. Each specified permissible deviation shall be binding by itself. No cumulative effect of permissible deviations will be considered.

The specified permissible deviations also apply to slip-form concrete, unless the Engineer has accepted another set of permissible deviations in writing beforehand. Such amended permissible deviations shall clearly make provision for interfaces between structures erected with the aid of conventional concrete.

The maximum permissible deviation from a 3 m long straight line connecting two points on the surface of a finished floor is 5 mm.

Add the following to G 6.2.3 b):

Monolithic finishes should be laid in panels of the same size as those of the base. For separate bonded finishes, the area of a panel should not exceed 9,0 m². Where a concrete overslab is used to provide a concrete wearing surface over a damp-proof membrane (i.e. separate unbonded construction), joint spacing should not exceed the lesser 30 times the slab thickness, and 4,5 m.

The general pattern of the panels will depend upon such aspects as the shape of the floor area and the position of columns. Wherever possible, panels should be square, or the length of a panel should be limited to 1.25 times its width, to reduce the tendency to crack.

SD G 7: TESTS

SD G 7.2: Testing

SD G 7.2.1: General

Add the following:

The Contractor shall allow for all the costs for testing in his rates.

SD G 7.3: ACCEPTANCE CRITERIA FOR STRENGTH CONCRETE

SD G 7.3.2: Criteria for Three Valid Test Results

Add the following to G 7.3.2:

Test results obtained by a ready-mixed concrete production plant as part of its quality-control system are not acceptable for evaluation purposes in terms of sub-clause G 7.3, but test samples shall be taken from ready-mixed concrete on location.

Cubes shall be taken on all pours in accordance with G 7.3. All costs hereof shall be deemed to be included in the rate tendered for the supply of concrete. Where cubes are not taken during a pour no payment shall be made for that particular pour.

Add the following new item to clause G 7:

SD G 8: MEASUREMENT AND PAYMENT

SD G 8.1: Measurements and Rates

SD G 8.1.1: Formwork

Add the following new sub-sub-clause to sub-clause 8.1.1:

SD G 8.1.1.7: Formwork to edges of screeding

Formwork to the edges of screeding will not be paid for separately. The rates for the concrete in the screeds must cover the cost of such formwork.

SD G 8.1.2: Reinforcement

Delete sub-clause G 8.1.2.2 and G 8.1.2.3 and replace with the following:

Mild steel and high tensile steel will be measured separately. Welded mesh will be scheduled separately for each type and mass per square metre of mesh.

The rate shall cover the cost of supply, cutting, bending, placing in position, and fixing of the reinforcing and supporting steel scheduled, and the provision of all spacer devices and binding wire, as well as the cost of tests in terms of SANS 920. The rate for welded mesh shall cover the supply, cutting and placing of mesh, as well as the cost of all waste due to laps.

SD G 8.1.3: Concrete

Add the following new sub-sub-clause to sub-clause 8.1.3:

SD G 8.1.3.4: Design of concrete mixes

The cost of preparation of mix designs by an approved laboratory and the shrinkage test for the aggregate will be regarded as included in the rates for concrete.

SD G 8.1.3.5: Surface finishing

Payment will not be made for wood trowelled surface finishes in the case where that surface is subsequently covered with a screed.

SD G 8.4: Scheduled Concrete Items

Add the following new payment items:

SD G 8.5: JOINTS

SD G 8.5.1: Construction joints in the chamber walls & inlet (horizontal) complete with prescribed sealant:
Unit : m

Sub-clauses SD G 5.5.7.1 and SD G 5.6.4 applies to this payment item.

The rate shall cover all costs regarding the supply and installation of the sealant and the forming and preparation of the concrete surfaces at the joint as per detail drawings.

SD G 8.5.2: Expansion or Isolation joints between chamber brick walls and surface bed, complete with filler and sealant:
Unit : m

Sub-clauses SD G 5.5.7.1 applies to this payment item.

The rate shall cover all costs regarding the supply and installation of the waterstop, void former, sealant and the forming and preparation of the concrete surfaces at the joint as per detail drawings.

SD G 8.5.3: Expansion or Contraction joints between chamber roof panels, complete with sealant:

Unit : m

Add the following payment items:

SD G 8.9: SUNDRY CONCRETE ITEMS

SD G 8.9.1: Casting in 110mm PVC sleeve x 150mm long for electrical duct pipe: Unit : No.

A PVC sleeve shall be cast into the floor of the chambers at a position as indicated on the drawings.

The rate shall cover the cost of all material and labour to complete the item.

L MEDIUM PRESSURE PIPELINES

L 2.1: Additional abbreviation

GRP: Glass fibre Reinforced Polyester

L3: MATERIAL

SD L 3.1: General

Substitute the first sentence of L3.1 with the following:

Types and classes of pipes shall be as specified on the drawings.

All steel pipes shall conform to SANS 719/1971 Grade B.

HDPE pipes should be joined by butt welding to provide homogeneous joints. Preheated pipes and/or fittings must be joined under controlled pressure and temperature conditions. A suitably skilled and/or certified operator is essential to ensure adequate weld strength development.

All mild steel specials, except puddle pipes, shall after manufacture be hot dip galvanized and coated internally and externally with PlascoatPPA 571 HES, to minimum 0.25mm coating thickness or carboline 891 (3 coats, minimum 125 microns/coat) to the manufacturers specification.

All stainless steel pipes shall be of Stainless Steel – Grade 316.

Only stainless steel - grade 316 bolts, nuts and washers shall be used on all fittings such as saddles, flanges, short collar couplings, etc.

Isolating bolt units shall be supplied and installed between dissimilar metals.

SD L 3.4: Steel pipes, fittings and specials

SD L 3.4.3: Pipes of nominal Bore over 150 mm

Replace L 3.4.3 with the following:

All pipes shall be manufactured from Grade B steel and shall have a wall thickness of at least 4.5 mm. The pipes and specials are to be welded and manufactured according to the requirements of SANS 719 Grade B.

All mild steel pipes and specials, except puddle pipes, shall after manufacture be hot dip galvanized and coated internally and externally with PlascoatPPA 571 HES, to minimum 0.25mm coating thickness or carboline 891 (3 coats, minimum 125 microns/coat) to the manufacturers specification.

Hydraulics tests, according to SANS 719, shall be carried out on all pipes prior to dispatch from the manufacturers workshop. The welding protective painting etc. shall be inspected and tested by the SANS or an approved independent inspection company. The test certificate shall be submitted to the Engineer upon delivery of the pipes to site.

SD L 3.4.4: Thrust and puddle flanges

Thrust flanges used for pipe anchorage shall be welded onto pipes and must be able to transmit a longitudinal force of 25% greater than the internal hydraulic pressure to be applied. The weld metal shall not exceed its yield stress when the test pressure of 1,25 times the working pressure is multiplied by the area of the bore. Puddle flanges used as water stops, not as anchorage, shall have a minimum thickness of 10mm.

SD L 3.7 Other types of pipe

SD L 3.7.3 GRP Pipes

GRP pipes must comply with the applicable stipulations in ANSI/AWWA C950-88 and must have a suitable flexible joint.

SD L 3.8: Jointing materials

SD L 3.8.1: uPVC pipes

Add the following to L 3.8.1:

Cast iron or uPVC fittings must be used to join uPVC pipes of diameter 200mm or less. Valves as specified in SD L 3.10.1 must be used on pipelines. The class of adaptors used shall be similar to the valve class, the cost of the adaptor shall be included in the cost of the fittings where not listed separately on the drawings.

GRP Pipes

All GRP pipework shall be of the Flowtite type (not Vectus) as manufactured by Fiberpipe or similar approved. GRP pipes shall be joined to other flanged pipe specials with GRP flanges (of the same pressure class), except where GRP flange adaptors are specified to connect plain ends of GRP pipe sections to flanged pipes and specials. Straight lengths of GRP pipe sections shall be joined with Flowtite double bell couplings with centre stops.

SD L 3.8.3: Flanges and Accessories

Change "SANS 1123 to "the applicable table in SANS 1123" and delete the words "or BS 4504"

SD L 3.8.4: Loose flanges

Substitute the first sentence of the last paragraph of L 3.8.4 with the following:

Bolts and nuts shall comply with the requirements of SANS 135.

SD L 3.9.5: Joints, Bolts, Nuts and Washers

Substitute L 3.9.5 with the following:

All joints, bolts, nuts and washers shall be stainless steel – grade 316.

SD L 3.9.7: Contact between Dissimilar metals

Isolating bolt units shall be supplied and installed. Contractor to notify the Engineer of areas where isolating bolt units were installed. Isolating bolt units shall be according to the Engineers approval.

Add the following to L 3.10

SD L 3.10.1: Gate Valves

1. All valves shall be of the AVK Type or approved similar and shall comply with the requirements of SANS 664, shall bear the SANS mark, and the pressure rating shall be as per the relevant drawings. All valves supplied shall be suitable for irrigation purposes.
2. Valves shall have non-rising spindles and the direction for opening and closing shall be permanently engraved on the valve casing and shall close clockwise.

3. Valves shall be fitted with cast iron tops, secured with retaining bolts or hand wheels as required on the drawings.
4. Only valves supplied with minimum thickness of 250 micron CoponKSIR 88 epoxy paint applied to all internal and external surfaces after it has been thoroughly cleaned by grit blastings to SA 2.5 finish in compliance with requirements of SIS 050900 or valves with similar approved coatings will be acceptable.
5. All flanged valves shall be drilled according to the applicable table in SANS 1123.
6. Pipes shall not be tested against a closed valve.
7. Thrust blocks for test sections shall be approved by the Engineer prior to testing of pipes.
8. Also refer to PMV bound in the Particular Specifications section.

SD L 3.10.2: Flow meters

The flow meter shall be a electromagnetic flow meter Endress Hauser or similar approved suitable for irrigation purposes and shall comply to the following basic technical specification:

- The readout unit should indicate the flow rate as well as totalizer readings
- Readout unit to be remote, within 25m from the meter
- 4-20 mA current output signal for the flow rate
- Pulse/Frequency output for alarm conditions as well as a active/passive output for the flow totalizer
- Forward, reverse and total flow counters
- Low flow cut off function
- Empty pipe detection function
- Operating pressure will not exceed 16 Bar
- Unit shall have a IP 68 rating
- Accuracy to be 0.5% or better
- Modbus RTU communication module
- Meter to be flanged in accordance with Table 1600/3
- Calibration certificate
- Body to be stainless steel 316
- Liner to be resistant to corrosivity of the operating environment.

SD L 3.10.3: Pressure Gauges

The pressure gauges to be used shall be of the Bourdon Tube type and shall comply to the following basic technical specification:

- Glycerine filled
- Gauges shall be accurate to 5 %
- The size of the face shall be 100 mm.
- The size of the connection shall be 10 mm BSP.
- Gauges shall be calibrated in meters water head.
- If specified, gauges shall be supplied with marking pointers.
- Gauge cocks shall be of the three-way type allowing venting to atmosphere.

SD L 3.10.4 Air Valves

Air valves for raw water shall be suitable for a working pressure of PN10 to PN25 as per drawings and schedule of quantities. All air valves shall be double action air valves of Variant or ARI or similar approved for irrigation purposes.

The branch of the tee on the main pipe shall be minimum 0,67 (2/3) of the diameter of the main pipe where not specified on the drawings.

All air valve installations shall be supplied with an isolating valve and distance piece between the air valve and the branch of the tee, and other fittings shown on the drawings.

Double-acting air valves shall have large as well as small orifices. The large orifice shall have a rubber bed, and the small orifice a brass bed on which the balls can shut. Double-acting air valves shall be flanged and supplied with flanged isolating valves. Air valves shall be designed to remain open until all the air has escaped and shall not close due to the speed of the escaping air.

SD L 3.10.5 Scour valves

Scour valves shall be suitable for a working pressure of PN10 to PN25 as per drawings and schedule of quantities.

Scour valves shall consist of a flanged gate valves and pipes according to detail drawings. Flanged scour valve tees shall be installed. The outlet shall discharge above ground level in the direction of the fall of the natural ground surface, perpendicular to the main pipe. The outlet end of the pipe shall be cut diagonally and supplied with a cover that is hinged and that will remain closed unless it is forced open by the water. The hinge and cover shall be non-removable and of a non-corrosive material.

SD L 3.10.7 Reflux Valves

a) Size: <200mm

- The discs shall be manufactured from Stainless Steel.
- All cast iron or steel surfaces shall be protected with an epoxy coating.
- Shafts, springs, bolts and nuts shall be manufactured from Stainless Steel 316.

b) Size: > 200mm

- All non-return valves > 200mm shall be of the high quality double door type or Noreva nozzle check valves.
- The disc shall be manufactured from Stainless Steel.
- All cast iron or Cast Steel surfaces shall be protected with an epoxy coating with a minimum DFT of 250µm.
- The valve seat shall be Stainless Steel 316.
- Shafts, springs, bolts and nuts shall be Stainless Steel 316.
- Preference will be given to valves with a metal to metal seal.
- Rubber seals shall be easily replaceable and the retaining ring shall be from Stainless Steel 316.

SD L 3.10.8 Butterfly valves

a) Wafer Type

Valves shall be of the single flange, flangeless or U-section pattern with the liner moulded to the body, conforming to BS 5155. The liner shall extend over the end faces and act as a gasket (COMPACT, KIM or similar).

Disks, shafts, bolts, & nuts shall be manufactured from stainless steel 316.

Unless otherwise specified, valves shall be fitted with gearboxes and hand wheels.

b) Flanged Type

Valves shall be double flanged and manufactured from cast iron or spheroidal graphite iron conforming to the requirements of BS 5155 (Boving or similar).

Valves shall have an easy removable stainless steel or bronze seat.

An adjustable seal of resilient material shall be fixed to the edge of the disc by means of a stainless steel or bronze ring.

The seal shall not require adhesives for bond.

The main shaft shall be of stainless steel and shall be offset from the centre-line of the disc so as not to pass through the seal.

Closure of valves shall be by clock-wise rotation of hand wheels.

Unless otherwise specified, valves shall be fitted with gearboxes and hand wheels.

b) Actuated Butterfly Valves (High Performance)

Only the following makes of valves are acceptable:

Palvalve, Gunric, Premier Boving, Ebro, Ainsworth, Cephas, KSB & AVK.

The valves shall have a double or triple (preferred) offset disc with a replaceable disc or body seal.

Actuated butterfly valves that are used in "Air" supply pipelines shall have metal to metal seats.

Materials of Construction

Body and disc:	Cast iron, Cast steel or Stainless Steel
Surface Protection if not SS:	Interior and Exterior: The surfaces shall be epoxy coated. The total DFT shall be not less than 250µm.
Seat:	Stainless Steel 316
Seal:	Natural Rubber, PTFE, EPDM or metal to metal and shall be easily replaceable (preference will be given to PTFE or metal to metal).
Seal Retaining Ring:	Stainless Steel 316

c) Non-actuated Butterfly Valves

Similar to the Ebro Z011-K1, KSB and Cephas RS ranges.

The valve shall have a self centering or floating disc, 2 stub shafts, and replaceable body liner.

Valves with a single shaft where the disc is fixed to the shaft by means of dowel pins or grub screws will not be accepted.

The gearbox shall be fitted with adjustable end-stops that must be pre-set in the factory.

Materials of Construction

Body:	Cast Iron or cast Steel
Disc:	Stainless Steel
Surface Protection:	Interior and Exterior: The surfaces shall be epoxy coated. The total DFT shall be not less than 250µm.
Body Liner:	Natural Rubber, EPDM
Bolts, Nuts & Shafts:	Stainless Steel 316
Gearbox:	Cast iron or Cast steel with shear pin.

L 3.11: Manholes and surface boxes

SD L 3.11.6: Surface boxes

Add the following to L 3.11.6:

The type of boxes shall be as specified on the drawings.

L 4: PLANT

SD L 4.3: Testing

Add the following to L 4.3:

The Contractor must ensure that the test equipment is in good order and that it is supplied with a calibration certificate upon request of the Engineer.

L5: CONSTRUCTION

L 5.1: Laying

SD L 5.1.4.5: Double flanged distance pieces

Add the following to L 5.1.4.5:

Double flanged distance pieces of the correct length to position valves on the correct level as indicated on the drawings must be installed at hydrants. This item will not be measured separately and will be deemed to be included in the rate for hydrants.

L 5.2: Jointing Methods (Steel Pipes)

SD L 5.1: Welded joints

Welding of stainless steel pipes shall be performed by qualified welders only. No welder shall be employed who does not have the necessary qualification for the specific material to be welded.

L 5.6: Valve and hydrant chambers

SD L 5.6.1: General

Substitute the first sentence of L 5.6.1 with the following:

The drawings of valve and hydrant chambers shall supersede the corresponding drawings in the standard specification.

SD L 7: TESTING

SD L 7.2.1: Tests on the welds of steel pipes

The contractor must allow for tests to be conducted at random, to ensure that the integrity of fabrication and workmanship with regards to the shop welding and field welding is in accordance with specifications.

- 1) Welders may be required to conduct a qualification test, if requested, by the Engineer, before material is manufactured and should comply with the required transverse and cold bend tests.
- 2) Both shop welds and field welds will also be subjected to Radiographic examination.

The contractor should allow in his prices for the supply of pipes, fittings, specials etc. at the contractors cost for the carrying out, under the supervision of the Engineer or any dually appointed inspector, the examination of shop welds.

Approximately 5% of all approved automatically deposited welds and approximately 20% of all

welds completed manually or semi-automatically as well as all repair works will be tested.

Approximately 10% of all field welds will be tested and the standard of acceptance will be API Standard 1104. The cost of testing the field welds will be borne by the Employer only if the test passes; if the test fails the Contractor will have to pay for the testing, re-testing and the repairs.

SD L 7.3: Standard hydraulic pipe test

SD L 7.3.1: Test pressure and time of test

Add the following to L 7.3.1.1:

Pipes shall not be tested against isolating valves. Special blank flanges or end caps, fully anchored, shall be provided for testing.

Substitute L 7.3.1.2 with the following:

The test pressure for field testing shall be 1,5 times the rated maximum working pressure of the pipe e.g. class 12 AC pipe (0,6 MPa rated working pressure) shall be tested to 0,9 MPa and class C AC pipe (0,9 MPa rated working pressure) to 1,35 MPa.

Substitute L 7.3.1.3 with the following:

The test pressure applied according to L 7.3.1.2, must, with allowance for any level differences along the pipe line, be such that the pressure at any point in the pipe will be at least 1,25 times and not more than 1,5 times the rated working pressure of the pipe.

SD L 8: MEASUREMENT AND PAYMENT

SD L 8.2: Scheduled items

SD L 8.2.1: Supply, lay and bed pipes complete with couplings

Add the following to L 8.2.1:

"The tendered rates shall also include full compensation for the cost of all labour, material, Construction equipment, chemicals and overheads for the complete sterilization of the entire water reticulation system and the disposal of the sterilizing solution as approved by the engineer."

SD L 8.2.3: Extra-over 8.2.1 for the supplying, fixing and bedding of valves Unit : No

Add the following to L 8.2.3:

Valves are measured and paid for per item, complete with the inclusion of the cutting of pipes, couplings, extra excavation and all extra material and labour that is required, including tees, fittings, isolating valves (e.g. under air valves), complete as shown on the drawings.

SD L 8.2.11: Anchor/Thrust blocks and pedestals Unit : m³

Substitute L8.2.11 with the following:

Anchor and thrust blocks shall be measured per cubic metre concrete and the tendered rate shall include for all formwork and reinforcement (where specified) for the required dimensions.

SD L 8.2.13: Valve and hydrant chambers Unit :No

Add the following to L 8.2.13:

"The tendered rate shall be an all inclusive rate for the complete valve chamber as per the relevant drawing. Included in the tendered rate shall be, among other, clear and grub, excavation, backfill, shoring, dewatering, protection of existing services, access ladders, manhole cover and frame with locking bar, ventilation pipes, lifting hooks, finishing of structure. Measurement shall be complete unit excluding reinforced concrete and formwork which is scheduled separately."

SD L 8.2.16: Connection to new and existing pipes

Unit : No

The connection to new and existing pipes shall be measured by the number of each type and diameter of pipe.

The tendered rate shall include supply and installation of connection fitting, full compensation (if necessary) for all arrangement with the relevant local authorities, providing a detailed method statement, isolating the main, connection to the main to accommodate the connecting fitting, removing of excess material, taking steps to prevent the ingress of material into the main as well as all material and labour to connect to the pipe.

SD L 8.2.18: Marker posts

Unit : No

Marker posts shall be placed on all horizontal alignment change points where bends were installed and on long straight pipe sections according to the Engineers requirements.

LB BEDDING (PIPES)

LB 3: MATERIALS

SD LB 3.1: Selected granular material

Substitute LB 3.1 with the following:

Selected granular material shall be an aggregate, sand or granular material, all of a non-cohesive nature and free from any organic material, of which the grading analysis shows 100% passing a 13,2 mm sieve and not more than 5% passing a 0,075 mm sieve.

SD LB 3.2: Selected fill material

Substitute LB 3.2 with the following:

The requirements of SD LB 3.1 shall apply mutatis mutandis.

SD LB 3.3: Bedding

Add the following to LB 3.3:

All pipes shall be classified as rigid pipes and shall be laid on a Class C bedding except water connections which shall be classified as flexible pipes.

SD LB 3.4.1: Suitable material available from trench excavation

Replace the first sentence of LB 3.4.1 with:

Irrespective the requirements of subclause 3.7 of SANS 1200 DB and subclause 3.4.1 of SANS 1200 LB regarding the use of selective methods of excavation, the Contractor must use selective methods of excavation and supply and use plant that will avoid burying or contaminating material that is suitable and required for bedding or covering the pipeline.

LB 5: CONSTRUCTION

LB 5.1: General

SD LB 5.1.4: Compacting

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

LB 8: MEASUREMENT AND PAYMENT

LB 8.1: Principles

SD LB 8.1.1: Supply of bedding materials measured separately

Add the following to LB 8.1.1:

Payment for bedding material and selected fill material is only made if the selected trench-excavation material cannot be used in the same position as bedding material but has to be obtained from another part of the site of works or designated borrow pits, or from commercial sources.

SD LB 8.1.4: Separate items for cradle and blanket

Substitute LB 8.1.4 with the following:

Although distinction may be made as regards items for the bedding cradle and selected fill blanket, the material in both cases shall comply with the requirements for material for bedding cradle.

SD LB 8.1.5: Disposal of displaced material

Add the following to LB 8.1.5:

Excess displacement material must be disposed of at the dumping site as specified in clause SD D 5.2.2.3.

SD LB 8.2.2.3: From commercial sources

Add the following to LB 8.2.2.3:

c) Bedding for wet condition Unit : m³

The requirements of SD LB 3.1 for bedding in wet conditions must be noted. Bedding for wet conditions will be measured and paid according to the measurements of Class C bedding for rigid pipes. The rest of the bedding as required for flexible pipes will be measured and paid for as normal bedding. Payment will only be applicable if ordered by the Engineer.

PM: MECHANICAL EQUIPMENT

SD PM 1 SCOPE OF SPECIFICATION

This Specification covers the detail requirements for specific items of mechanical equipment to be designed, drawn, manufactured, supplied, delivered, erected, installed, tested on site, commissioned and maintained under this Contract. The requirements of this Specification are in addition to those specified in the Particular Specifications as contained in this Document for this Contract, and in case of any discrepancies, the detail requirements contained in this Specification shall prevail.

SD PM 2 SCOPE OF WORK

The scope of Work in this Contract shall be the Work in accordance with these Specifications for the acquisition of the mechanical equipment systems embodying the following:

- (a) Pumps
- (b) Valves

SD PM 3 INFORMATION TO BE SUBMITTED WITH TENDERS

SD PM 3.1 General

Tenderers shall supply all information and technical data, as specified in the Particular Specification PM: General Specification for Mechanical Equipment.

SD PM 4 INFORMATION TO BE SUBMITTED AFTER AWARD OF TENDER

The Contractor shall supply all information and drawings as required by Clause PM-2.2.3 of the Particular Specification PM: General Specification for Mechanical Equipment within 21 days after receiving a written notification of the award of tender. Particular or additional information for specific items of mechanical equipment as listed below shall be submitted with that specified under Clause PM-2.2.3.

SD PM 5 PUMPS

SD PM 5.1 Design

SD PM 5.1.1 Booster Pump

These pumps are to be end suction centrifugal pumps with double mechanical seals. The pump, mounted on a common baseplate, with the motor coupled by means of an approved flexible-or gear coupling.

The coupling shall be rated at least 50% higher than the required duty. The rotational speed of the pumps shall be 1500 rpm.

The in- and outlets of the pumps shall be according to the positions as shown on the drawings.

SD PM 5.2 The required estimated duties of each of the sets of pumps are tabled below:

Pump	System Operation (Duty & Standby)	Duty	
		Combined	
		Q(m ³ /h)	H(m)
Booster Pumps	2 + 1	540	105
Submersable Pumps	1 + 1	540	15

The Contractor shall submit, prior to final selection of the pump, full design curves with estimated duties, based on submitted design curves.

SD PM 5.3 Measurement and payment

SD PM 5.3.1 Supply and installation of pumps (Location specified) Unit : No.

The unit of measurement shall be the number of pumps, complete with motor, baseplate, flexible coupling, pressure gauges on in and outlet and everything specified.

The rate shall cover all costs for labour, tools, equipment, transport and everything necessary to manufacture, test, deliver to site install and commission the pumps as specified. Also include in the rate the requirements as per PS PM bound under Particular Specifications.

SD PM 6 VALVES

SD PM 6.1 General

The isolating, non-return and air valves to be used on this Contract shall be of the following type or make or approved similar:

SD PM 6.1.1 Butterfly valves

Refer to SANS 1200 L for specifications of Butterfly valves.

SD PM 6.1.3 Air valves

Refer to SANS 1200 L for specifications of Air Valves.

SD PM 6.2 Measurement and Payment

The payment items of SANS 1200 L, Medium Pressure pipelines shall be applicable.

SD PM 8 DRAWINGS

The Contractor shall submit two sets of installation drawings (paper prints) for the pumps and pipe work, layout drawings and wiring diagrams of the control panel for approval by the Engineer. Prior to manufacturing, five sets of the approved drawings shall be submitted to the Engineer.

On completion of the works, one set of reproducible sepia prints, consisting of all of the above drawings, updated to reflect the as built-conditions, shall be handed to the Engineer. One set of paper prints of the as built-wiring diagrams, shall be provided in suitable plastic covers affixed to the inside of the control panel doors.

SD PM 9 OPERATION AND MAINTENANCE

Two draft sets of operation and maintenance manuals shall be submitted the Engineer for approval, at least three weeks before commissioning commences. The manuals shall be in Afrikaans, but standard printed documentation such as pamphlets, brochures, etc, can be in English. The manuals shall also contain a complete set of the drawings associated with the works. One copy will be returned to the Contractor not less than one week before commissioning commences, for correction and adaption on Site as necessary. Once the documentation has been corrected and adapted, three sets of the final operation and maintenance manuals shall be suitably bound and submitted to the Engineer.

SD PM 10 DEFECTS LIABILITY PERIOD

The Contractor shall guarantee the Subcontract Works against faulty workmanship and equipment for a period of 12 months from the date of issue of the Certificate of Completion.

SD PM 11 TESTING AND COMMISSIONING

The Contractor shall test and commission each reservoir pump station to verify that the equipment performs in accordance with the requirements of the Specifications as follows:

- a) Hydraulically pressure test each pump, pipe and valve installation in accordance with SANS 1200 L subclause 7.3 to a test pressure of 2250 kPa for a minimum period of 24 hours after which period no pressure loss shall be indicated on a calibrated pressure gauge and no water leaks shall be visible.
- b) Test the electrical installation for continuity and insulation resistance of all electrical cables and perform all other tests required for the certificate of compliance in terms of the Occupational Health and Safety Act, Act 85 of 1993. Where required, electronic equipment shall be disconnected during these tests to avoid possible damage. The electrical subcontractor shall then issue a certificate of compliance in terms of the Occupational Health and Safety Act, Act 85 of 1993.
- c) Test the performance of each of the following safeguards
 - Thermal over current protection for the motor
 - Under and over voltage protection
 - Incorrect phase sequence protection
 - Phase failure protection
 - Low water level protection
 - Water flow measuring system and no flow protection
 - High and low water pressure protection system
- d) Run the pumps and test for direction for rotation and verify the current drawn to set the overload relays.
- e) Ascertain the pump duty point by measuring the pressure drop across the pump and verifying the flow rate on the pump curve. The Employer will supply water and power free of charge for this purpose.
- f) On the successful completion of all the tests, each pump station shall be commissioned.

SD PM 12 TRAINING OF PERSONNEL

During the commissioning of the pump stations, the Contractor shall train appointed personnel in the operation of the pump stations and control systems. For this purpose, the draft operation and maintenance manuals shall be made available to such personnel for study. The training of personnel shall be to the satisfaction of the Engineer.

SD PM 13 CERTIFICATE OF COMPLETION

The Contract Works will only be considered to be completed and the Certificate of Completion will only be issued when all of the following conditions have been met:

- a) The Contract Works have been successfully tested and commissioned.
- b) The as built-drawings have been provided.
- c) The operation and maintenance manuals have been provided.
- d) The Employer's personnel has been trained.
- e) The Site has been cleared and tidied to the satisfaction of the Engineer.
- f) All other conditions of the Specifications have been met.

SD PM 14 QUALITY ASSURANCE

The Contractor shall be responsible for ensuring that the performance of the reservoir pumps is in accordance with the Specifications.

The governing standards for the entire installation shall be those stated by the South African laws and regulations and the latest SANS standards.

In the absence of SANS standards, the relevant BS., DIN, Japanese or American standards will suffice.

- a) Where foreign countries' standards are quoted in the Specifications, the equivalent standard from any country can be used provided that the Contractor can satisfy the Engineer that the standard is equal to the standard specified.
- b) The static equipment offered shall have a lifespan of 40 years and particular attention shall be given to the internal pipe corrosion aspect i.e galvanising
- c) The dynamic equipment shall have a lifespan of 40000 hours and particular attention shall be given to the pump & motor bearings and seals, as well as the motor starter contacts and control relays.
- d) The orders for the pumps and motors, valves and the electrical control panel shall be approved by the Engineer before they are issued to the subcontractor/supplier by the Contractor.
- e) Workshop drawings for manufactured items i.e. the pipe work and the control panel shall be approved by the Engineer before manufacture commences.
- f) All equipment bought out by the Contractor shall be inspected for compliance with the order and the Specifications at the supplier/manufacture before delivery to Site.

SD PM 15 TERMS OF PAYMENT

Up to 90 % of Tender value shall be paid as progress payments when certified by the Engineer.

A further 5 % of Tender value shall be paid on issue of the Certificate of Completion of the Works.

A further 5 % of Tender value shall be paid on issue of the Final Approval Certificate

C 3.4 CONSTRUCTION SPECIFICATIONS

PART C: PARTICULAR SPECIFICATIONS

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PROJECT SPECIFICATION

C3.4: CONSTRUCTION SPECIFICATION

PART C: PARTICULAR SPECIFICATIONS

PE ELECTRICAL EQUIPMENT

PS PE 1 SCOPE OF SPECIFICATION

This Specification covers the detail requirements for specific items of electrical equipment to be designed, drawn, manufactured, supplied, delivered, erected, installed, tested on site, commissioned and maintained under this Contract. The requirements of this Specification are in addition to those specified in the Particular Specifications as contained in this Document for this Contract, and in case of any discrepancies, the detail requirements contained in this Specification shall prevail. The Specification shall be read with the Particular Specifications for Electrical equipment PM, PMC, PMG, PMM, PMV, PMO, PMP and PMV.

PS PE 2 SCOPE OF WORK

The scope of Work in this Contract shall be the Work in accordance with these Specifications for the acquisition of the electrical equipment systems generally embodying the following:

- (a) Instrumentation i.e. flow meter, flow sensor, level sensor, pressure sensor
- (b) Pump Control Systems
- (c) Pump station Low Voltage Electrical Installations

PS PE 3 INFORMATION TO BE SUBMITTED WITH TENDERS

PS PE 3.1 General

Tenderers shall supply all information and technical data, as specified in the Particular Specification PE: General Specification for Electrical Equipment.

PS PE 4 INFORMATION TO BE SUBMITTED AFTER AWARD OF TENDER

The Contractor shall supply all information and drawings as required by Clause PS PE 3.1 of the Particular Specification PE: Specification for Electrical Equipment within 21 days after receiving a written notification of the award of tender. Particular or additional information for specific items of electrical equipment as listed below shall be submitted with that specified under Clause PM-2.2.3.

PS PE 5 INSTRUMENTATION

All instruments will be 24VDC powered and will have a 4-20mA output. Where available or specified an output will be provided to indicate an error on the instrument i.e. flow meters, level sensors, pressure sensors etc.

All 4-20mA signals connected to the PLC analogue input cards will be fused with 32mA fuses before entering the card. Internal diagnostic functions must be used to enable the detection of errors in the instrumentation. All instrumentation should be provided with a MODBUS communication port where possible or specified.

All 4-20mA control signals and error signals will only be connected to the control unit or SCADA

system. Signal re-transmission units shall be used for signals required for monitoring purposes. All signals not connected directly to the control panel will be connected to the nearest point on the bus system to transfer the signal to the SCADA respectively.

All instrumentation and supply must be provided with lightning and surge protection from the i.e. DEHNventil, DEHNguard and BLITZDUCTOR product range or similar and equal approved.

PS PE 5.1 FLOW METER

PS PE 5.1.1 General

- The flow meter shall consist of a flow sensing unit, a transmitting unit and a receiving unit. They shall incorporate automatic zero and span stability and have an integral zero and span check.
- Full lightning and surge protection with automatic reset shall be incorporated.
- The sensor to be provided with internal diagnostic functions to enable the detection of errors in the instrumentation.
- The Contractor shall install an effective earthing system from flange to flange and to the meter (4mm², insulated copper conductor), as well as to the earthing system in the control panel.
- The purpose of the flow meter is to determine the flow, totalising capacity as well as for controlling the pump motors during low flow and too high flow conditions in the pipe line.
- The totalizer reading from the flow meter shall be interfaced with the PLC and transferred to the Telemetry / SCADA system. 2 x Digital outputs to be provided for each flowmeter i.e. totalizer and instrument error.
- Refer to equipment and preferred product list as included.

PS PE 5.1.2 Technical requirements

The flow meter shall conform to the following general specifications:

- Type : Electromagnetic
- Make : Endress& Hauser or similar and equal approved (Compact or remote revision as applicable)
- Supply voltage : 24VDC
- Display Readout : Integral or remote illuminated display as applicable
- Display parameters: Flow in cubic meters/hour as well as Totalizer in cubic meters
- Keypads: Touch control
- Data protection : EEPROM (with battery back-up)
- Accuracy : +/- 0,5% of full scale or +/- 0,5% of readout for: 0,25 < flow rate < 8,00 m/s
- Calibration : Factory calibrated (and equipped with special circuit for electrode cleaning)
- Protection Class : IP 67
- Classification of Area: Non-hazardous
- Liner : Hard rubber
- Diameter : As per specification and drawings
- Operable flow range: 1000:1
- Output signal : Linear Analogue 4 to 20mA signal is unipolar; linear)
- Pulse output: 0 to 10kHz (full scale flow rate is user specified; linear)
- Flow direction: Two Way
- Alarm output: Potential free contact (Activated on instrument error and PSU failure) and PSU failure)
- Status output: Potential free contact (Activated on empty pipe detection)
- Ambient temperature: 20 to +60 deg C
- Water temperature: 0 to 50 deg C
- SCADA Interface : RS485, MODBUS RTU

w) Flange Drilling: SANS 1123

PS PE 5.2. Calibration Certificate

Before calibration the sensor shall be hydraulically tested to twice its specified working pressure. Factory calibration shall be carried out on the actual equipment supplied. A calibration certificate shall be submitted to the Engineer stating the accuracy and repeatability for various flow rates within the useful range of the meter.

PS PE 5.3 Measurement and Payment

Supply, install, test and commissioning (location specified)

Unit: No

The unit of measurement shall be the number of flow meters complete with instrumentation cable work, holder, and everything necessary to ensure optimal operation of the unit.

The rate shall cover all costs for labour, tools, equipment, transport and everything necessary to manufacture, test, deliver to site, install and commission of the flow meter as specified.

PS PE 6 FLOW SENSOR

PS PE 6.1 General

- a) The flow sensor shall be of the compact one-piece self-contained type.
- b) The flow sensor shall be able to withstand the anticipated water hammer in the pipeline.
- c) The flow sensor shall be provided with LED indication to generally indicate the following i.e. red (relay not activated), yellow (relay is activated), green (flow relay is activated).
- d) The limit switches shall consist of two sets of switch contacts, one normally closed and one normally open contact. These contacts shall have a contact rating to switch 4A DC.
- e) Refer to the equipment and preferred product list as included.

PS PE 6.2 Technical Requirements

The flow sensor shall conform to the following general specifications:

Make:	EGE SN450 or similar and equal approved
Type:	Stainless steel.
Measuring tip:	80mm (min)
Supply voltage :	24VDC
Measuring range:	1-150cm/s
Display readout :	LED display (red, yellow, green)
Signal output:	Potential-free relay contact (4A DC,60W)and PS failure)
Calibration :	Factory calibrated (and equipped with special circuit for electrode cleaning)
Housing:	Polyamid
Protection class :	IP 67
Classification of area:	Non- hazardous
Ambient temperature:	-20 to + 60 deg C

PS PE 6.3 Calibration Certificate

Before calibration the sensor shall be hydraulically tested to twice its specified working pressure. Factory calibration shall be carried out on the actual equipment supplied. A calibration certificate shall be submitted to the Engineer stating the accuracy and repeatability for various flow rates within the useful range of the meter.

PS PE 6.4 Measurement and Payment

Supply, install, test and commissioning (location specified)

Unit: No

The unit of measurement shall be the number of flow switches complete with cable work, holder, and everything necessary to ensure optimal operation of the unit.

The rate shall cover all costs for labour, tools, equipment, transport and everything necessary to manufacture, test, deliver to site install and commission of flow switches as specified.

PS PE 7 WATER LEVEL SENSOR

PS PE 7.1 General

- The level sensor shall consist of a level sensing unit, a transmitting unit and a receiving unit. They shall incorporate automatic zero and span stability and have an integral zero and span check. Full lightning and surge protection with automatic reset shall be incorporated.
- The sensor to be provided with internal diagnostic functions to enable the detection of errors in the instrumentation.
- The Contractor shall install an effective earthing system from the meter (4mm², insulated copper conductor), to the earthing system in the control panel.
- The purpose of the level sensor is to determine the level of the reservoir and sumps for controlling of the respective pump motors.
- The transmitter shall be mounted onto the concrete cover of the reservoir or sump as applicable.
- The reading from the level sensor shall be interfaced with the PLC and transferred to the Telemetry / SCADA system.
- Also refer to the equipment and preferred product list as included.

PS PE 7.2 Technical requirements

The sensor shall conform to the following general specifications:

Make:	Endress& Hauser or similar and equal approved
Measurement method :	Ultrasonic
Type:	Electronic i.e. PROSONIC T (FMU231E)
Thread :	G2" (cylindrical)
Supply voltage :	24VDC
Signal output:	Linear Analogue 4 - 20mA
Alarm output:	Potential free contact (Activated on system error and PSU failure)
Display :	Remote display (in pump station building)
Display Readout:	level in meter (m) or volume (cm)
Calibration :	Factory calibrated (and equipped with special circuit for electrode cleaning)
Data Protection :	EEPROM (with battery back-up), non-volatile
Alarm output:	Potential free contact (Activated on instrument error and PSU failure and PSU failure)
Housing:	Plastic housing
Protection class :	IP 67
Classification of area :	Non- hazardous
Ambient temperature :	20 to +60 deg C`
Water temperature :	0 to 50 deg C
SCADA Interface :	RS485 / MODBUS RTU

PS PE 7.3 Calibration

Factory calibration shall be carried out on the actual equipment supplied. A calibration certificate, if the sensor deviates from the technical specifications as issued by the manufacturer, shall be submitted to the Engineer stating the accuracy and repeatability for various levels within the useful range of the sensor.

PS PE 7.4 Measurement and Payment

Supply, install, test and commissioning (location specified) Unit: No

The unit of measurement shall be the number of level sensors complete with instrumentation cable work, holder, and everything necessary to ensure optimal operation of the unit.

The rate shall cover all costs for labour, tools, equipment, transport and everything necessary to manufacture, test, deliver to site, install and commission of the level sensor as specified.

PS PE 8 PRESSURE SENSOR

PS PE 8.1 General

- The pressure sensor shall consist of a pressure sensing unit, a transmitting unit and a display unit. It shall incorporate automatic zero and span stability and have an integral zero and span check.
- Full lightning and surge protection with automatic reset shall be incorporated.
- The sensor to be provided with internal diagnostic functions to enable the detection of errors in the instrument.
- The Contractor shall install an effective earthing system from the sensor (4mm², insulated copper conductor), to the earthing system in the control panel.
- The purpose of the pressure sensor is to monitor the pressure on the delivery and suction side of the pipe manifold for controlling of the respective pump motors.
- The sensor shall be mounted on the pipe work as applicable.
- The reading from the pressure sensor shall be interfaced with the PLC and transferred to the Telemetry / SCADA system.
- Refer to the equipment and preferred product list as included.

PS PE 8.2 Technical requirements

The transmitter shall conform to the following specifications:

Make:	Endress& Hauser or similar and equal approved
Type:	Ceramic diaphragm i.e. Cerabar S
Thread G2"	(cylindrical)
Supply voltage:	24VDC
Signal output :	4 - 20mA
Alarm output :	Potential free contact (Activated on system error and PSU failure)
Measurement range (min):	10mBar - 40Bar
Display:	Integral or remote display as applicable
Calibration:	Factory calibrated (and equipped with special circuit for electrode cleaning)
Alarm output:	Potential free contact (Activated on instrument error and PSU failure) and PSU failure)
Housing:	Plastic housing
Protection class :	IP 67
Classification of area :	Non- hazardous
Ambient temperature :	-20 to +60 deg C

Water temperature: 0 to 50 deg C
 SCADA Interface: RS485 / MODBUS RTU

PS PE 8.3 Calibration

Factory calibration shall be carried out on the actual equipment supplied. A calibration certificate, if the sensor deviates from the technical specifications as issued by the manufacturer, shall be submitted to the Engineer stating the accuracy and repeatability for various pressures within the useful range of the sensor.

PS PE 8.4 Measurement and Payment

Supply, install, test and commissioning (location specified) Unit: No

The unit of measurement shall be the number of pressure sensor complete with instrumentation cable work, holder, and everything necessary to ensure optimal operation of the unit.

The rate shall cover all costs for labour, tools, equipment, transport and everything necessary to manufacture, test, deliver to site, install and commission of the pressure sensor as specified.

PS PE 9 PUMP CONTROL SYSTEMS

PS PE 9.1 General

The pump station control system shall be incorporated into the motor control centre (MCC) which is to be located inside the pump station building, as shown on the applicable drawing.

The typical pump station control system shall be interfaced with the flow meter, level sensor, flow switches and pressure sensors as required. These signals shall be incorporated into the control logic for controlling of the pumps for the control modes specified.

The control and monitoring system shall be based on the following general principles and functional requirements:

- Control system voltage shall be 24V DC
- PLC control
- HMI touchscreen control and monitoring
- Standard bus system i.e. MODBUS
- Local based control narrative
 - No automated control via remote control in general control philosophy (only special use of telemetry and SCADA in automated control of pump stations)
- Minimum component requirement
- Minimum relay requirement
- Minimum wiring requirement
- Standardized design and construction
 - Good voltage and protection for incomers for pumps and control systems
- Effective lightning and surge protection
- Easy fault finding for corrective action
- Low maintenance and high robustness

Refer to the equipment and preferred suppliers list as included.

PS PE 9.2 Technical requirements

The control system for the pump station shall conform to the following general specifications and requirements:

Control system voltage	12V/24V DC via 12V battery and converter
Control Architecture	HMI interface, PLC
Inputs Analogue	4 - 20mA (measurements of sensor signals) 4 - 20mA VSD feedback
Inputs Digital	Contact status for pressure switch, flow meter, alarm and trip conditions for motor protection switchgear.
Input status	HMI Touch Screen
Outputs Analogue	4 – 20mA VSD control
Outputs Digital	Contacts for controlling of pump motors and alarms
Output status	HMI Touch Screen
Display:	Continuous level of sump Continuous pressure on suction and delivery pipework Exit flow from pumpstation

PS PE 9.3 Control Modes

Selection and control for the control modes specified shall be facilitated via a HMI touch screen interface.

PS PE 9.3.1 OFF (selection on touchscreen HMI)

Both pump motors shall be switched off, but power supply to the level and flow meters shall not be interrupted. Manual and automatic control of the pump motors shall be disabled.

PS PE 9.3.2 AUTO (selection on touchscreen HMI)

The pump motors shall be switched on alternately after each pumping cycle. The pump motors shall be interlocked via the PLC for preventing the starting of pump motors simultaneously. The following conditions shall be incorporated into this mode:

- One of the pumps running: The pressure sensor is between the “PUMP START” and “PUMP STOP” levels as measured by the sensor. The flow sensor is closed. No alarm conditions, such as over current trip, thermal protection or any other relevant alarm condition as initiated by the pump motor control switch gear, shall be present for the specific pump motor selected.
- Pump motor switched off: The pressure sensor has reached the “PUMP STOP” level or an alarm condition occurred.
- Pump motor failed: An attempt was made to start one of the pump motors, but the “motor run” status could not be detected by the control system. This will indicate an alarm condition, but the pump motor will be switched off and the other pump motor will be selected and started accordingly. The alarm indication shall not be cleared during this condition, but the other remaining pump motors shall be selected.

PS PE 9.3.3 MANUAL (selection on touchscreen HMI)

The pump motors can be controlled individually and manually from the front of the control panel by the selecting the respective input on the HMI. All pumps shall be interlocked such that only one pump can be switched on at a time. The pump motors shall be prevented from being switched on if any alarm condition, for the specific pump, exists. Certain time delays must be incorporated for the flow meter for filling of the pipe line after starting up of the pump station initially.

PS PE 9.3.4 Telemetry (selection on touchscreen HMI)

The pump motors can be remotely controlled through the telemetry SCADA system. All pumps shall be interlocked such that only one pump can be switched on at a time. The pump motors shall be prevented from being switched on if any alarm condition, for the specific pump, exists.

PS PE 9.3.5 RESET (security enabled selection on touchscreen HMI)

The control system itself as well as alarm conditions shall be reset or cleared.

PS PE 10 PUMP STATION LOW VOLTAGE ELECTRICAL INSTALLATION

PS PE 10.1 General

Should any of the technical requirements in terms of the Specification and Drawings be found to be contradictory, the following list of documents, in descending order of preference, shall apply.

- a) Specification
- b) Drawings
- c) Schedule of Quantities

The contractor shall bring such contradiction to the attention of the Engineer prior to the ordering of materials and execution of work that may be affected by such contradiction.

PS PE 10.2 Standards

The contractor shall be responsible to ensure that the works comply in full with the requirements as per the local laws, regulations, standards and codes of which the latest revision and issue shall apply.

- a) Occupational Health and Safety Act, Act 85/1993
- b) The Construction Regulations 2003
- c) Code for the wiring of premises, SANS10142-1 (2008)
- d) The Regulations of the Local Supply Authority
- e) The Regulations of the Local Fire Brigade
- f) The Regulations of the local communication authorities
- g) The standard regulations of any Government Department or Public Service Company where applicable.
- h) Specifications and codes by the local Bureau for Standards where applicable.
- i) Technical guidelines and/or specifications issued by the Local Authorities applicable within the area of jurisdiction.

It is assumed that the contractor is conversant with the abovementioned laws, regulations, standards and codes. Should any law or regulation contradict the specification or become applicable during construction, the contractor shall inform the Engineer accordingly and prior to the ordering of materials or execution of works affected.

PS PE 10.3 Extent of the Installation

The pump station electrical installation shall generally consist of the following but not necessarily limited to:

- a) The pumpstation motor control centre (MCC), complete with all switchgear, instrumentation, motor product units (MPU's), VSD's and control equipment as specified and required,

- b) The flow meter, flow sensor, pressure sensor, level sensor,
- c) Instrumentation cabling for the above instrumentation as per the manufacturer's specification and requirements (Dekabon cable to be used or similar and equal approved),
- d) Supply cabling from MCC to the pump motors secured via cabletray / cable trench or sleeves as applicable. The cable for each pump motor shall be suitably rated according to the pump motor and shall be PVC/PVC/SWA/XLPE (600/1000V) copper conductor cable with bare copper earth conductor fixed at 115mm intervals. The supply cables shall be terminated and connected at both ends, with suitable K-clamps or glands as applicable.
- e) Lighting and small power installation to building as per layout and single-line drawings issued.
- f) Testing of pump installation and setting of all protection and measuring equipment for correct and optimum operation.
- g) Testing and commissioning of the electrical installation.
- h) The external electricity supply cable and earth wire to the control panel and DB respectively will be supplied and installed by others. The electrical subcontractor shall allow for the termination and connection of all cables into the control panel and DB, the flow meter, level sensor, pressure sensor, flow switch, pressure sensor and the level sensor at the reservoir.
- i) Lightning and Surge Protection (Class 1 and Class 2) shall be provided to protect the electrical and electronic equipment, as required. Potential-free contract to be provided for PLC input.
Should a separate earth connection be required for this purpose, the electrical contractor shall supply and install the earthing accordingly. All instrumentation equipment shall be connected to this common ground system. The lightning and surge protection shall be of the DEHN family range (i.e. DEHNventil, DEHNgaud and BLITZductor) or similar and equally approved.
- j) Danger signs

Indelible danger signs for electrical apparatus shall be provided on the outside of each door of the control panel. The danger sign (lightning arrow) shall be in accordance with the requirements of the Occupational Health and Safety Act, Act 85 of 1993 (as amended).
- k) Padlocks

The doors of the control panel shall be locked with padlocks. The Contractor shall purchase the padlocks from NAMWATER and install as soon as the panel is installed on site.
- l) Motor Control Centre (Switchgear and power equipment)

The control panel / switchboard shall be of a compartmentalised construction type and will make separate provision for the following i.e. main incomer section, pump motor supply switchgear, motor protection units and starters / VSD's section and the instrumentation / control section. At least 20% spare space must be provided for in the

motor control centre / switchboard for future applications.

The following equipment and allowances shall be provided in the switchgear section of the control panel. Switchgear and power equipment shall generally comply with the following minimum requirements but not necessarily be limited to:

- i Main supply circuit breaker
- ii Lightning and surge protection

Lightning and surge protection shall be provided on the main incoming supply to the control panel and shall be of the DEHN product range or similar and equal approved.

- m) Supply circuit breaker for each of the pump motors.

Each pump motor shall be provided with a suitably rated supply circuit breaker. Cognisance shall be taken of start-up currents and trip curve characteristics in the selection of the circuit breaker. Circuit breakers shall be of the ABB, Schneider range or similar and equal approved. The handling mechanism must be of metal construction i.e. Moeller or Shint or similar and equal approved.

- n) Suitably rated motor protection units (relays) for each of the pump motors with remote reset functionality.

Each pump motor shall be provided with motor protection units as follows:

Motors < 45kW will be provided with electronic motor protection i.e. Mitsubishi ETN or similar and equal approved.

Motors > 45kW will be provided with electronic motor protection i.e. Sprecher and Schuh CET4 or similar and equal approved.

Motors > 75kW will also be provided with 6 x PT100 temperature sensors as applicable. Two per winding. The temperature sensors shall be connected to the motor protection unit.

The motor protection unit shall comply with the following general standards and requirements but will not necessarily be limited to:

- Basic protection functions i.e. full thermal protection, asymmetry and phase failure, high overload or stalling, underload, earthfault, start time and starts per hour supervision, warm start.
- Settings and features i.e. selectable auto/manual reset of thermal trip, adjustable thermal reset value, cooling constant ration motor on/off adjustable, failsafe or non-failsafe operation of trip relay, emergency start facility, remote reset facility, general alarm relay, set-up security of set values.
- Adjustable warning functions i.e. thermal overload pre-warning, asymmetry level, high overload (approaching stall), earth fault, underload activated.
- Modular design for flexibility i.e. extra features can be added, plug-in optional cards for matching operation requirements, wide range current converter module.
- Information display i.e. average motor current, thermal utilisation %, assymetry present, time to reset (if tripped), individual phase currents, time to trip (if in overload mode), earth current, temperature levels (if used)
- Easy set-up of parameters and simple and quick malfunction tracing
- Storage of statistical data in non-volatile memory i.e. unit operating time, motor run hours, number of starts, time since last start, time of previous trip, cause of previous trip, current, asymmetry, maximum temperature, earth current, logging of time and duration of momentary power failures.

- Suitably rated variable speed drives (VSD's) for each pump motor

Each pumpmotor shall be provided with a suitably rated variable speed drive (VSD) i.e. Zest, ABB, Schneider, Danfos, Motorelli or similar and equal approved. The VSD information shall be interfaced to the PLC via MODBUS. The VSD speed control and feedback shall be 4-20mA hardwired. The speed reference signal is to be loop isolated.

The VSD unit shall comply with the following general standards and requirements but will not necessarily be limited to:

- Dedicated to variable torque applications
- Integrated PID controllers and PFC (pump and fan control)
- Pre-programmed protection functions
- Integrated energy-efficiency features and energy optimizer
- Load Analyzer for optimised drive, motor and process dimensioning,
- Modbus / RS485 communication ports
- Fast parameter setting
- High temperature and humidity resistance
- Short parameter menu view

Also refer to the motor starter specification as included in the PMN Motor Starters section in the document.

- 24VDC Control circuit supply of rating equal to 200 % of the expected power drawn for the control circuits and instrumentation i.e. sensors.
- 5A SP circuit breaker for the supply to the telemetry module. (Telemetry installation and connection and SCADA development by others)
- The necessary internal wiring required to connect the equipment. All wiring shall be neatly arranged and strapped.
- 1x63A DP ELU, 1x15A SP, 1x20A SP, 2x30A SP C1 for general building electrical to the pump station building i.e. lighting and small power.
- All circuit breakers used within the switchboard shall be lockable from the outside
- 20% spare space capacity within the motor control centre / switchboard
- Refer to the equipment and preferred product list as included in document.

n) Instrumentation, monitoring and control

The following shall be provided in the instrumentation section of the control panel. Instrumentation, selector switches, push buttons and indicating lights shall be mounted on a hinged section behind a door of the control panel. All other equipment shall be mounted on the mounting panel behind or below the hinged panel or as applicable. The construction of the control panel will make provision for the use of a bus system for connection to the SCADA system to monitor and control the switchboard.

The following instrumentation, control and associated power supply equipment shall be provided as a minimum but not necessarily be limited to:

- Separate digital voltage and ammeter per control panel to indicate the voltage and current measurement per phase with suitable instrument fuses. The panel meters shall be of the Lovato, Socomec type or similar and equal approved.
- Separate digital amp meter per pump motor indicating current measurement per phase. The panel meter shall be of the Lovato, Socomec type or similar and equal approved.

- Separate digital running hour meter per pump motor indicating the elapsed operating time of each pump motor for duty selection and maintenance purposes.
- The control system power supply shall consist of a 12V power supply / battery charger connected to a maintenance-free battery. A 12/24V converter with low voltage cut-out will be used to provide the 24V to the control system. Power supply equipment shall be of the Victron type or similar and equal approved.
- Voltage window comparator for protection of equipment and shall be of the Rhomberg type or similar and equal approved.
- Equipment for interfacing the flow meter and control system.
- Equipment for interfacing the flow sensor and control system.
- Equipment for interfacing the water level sensor and control system.
- Equipment for interfacing the pressure sensor and control system.

o) Human Machine Interface (HMI)

The motor control panel shall be provided with a touch screen operated human machine interface to facilitate the local manual control, control mode selection, pump motor monitoring, instrumentation monitoring via the overview screen.

The following shall generally be provided on the overview screen but not necessarily be limited to:

- Control selection (OFF / MANUAL / AUTO / TELEMETRY)
- Pump motor control (Start / Stop / Reset)
- Pump motor status indication (Run / Trip / Available)
- Instrumentation (flow meter, pressure, level, MCC panel temperature)
- Functional icons on the overview screen as required. Overview screen to be submitted to Engineer for evaluation and comment prior to further design development.

Refer to the minimum I/O specification for further clarification as to the typical signal count and requirements. The HMI shall be of the Siemens Simatic Touch range or similar and equal approved.

- p) Sufficient screw terminals of the ABB ADO or Entrelec type or similar and equal approved shall be provided for all outgoing control wiring. In addition to terminals for all present control wiring, a further 16 terminals shall be provided for future control wiring.
- q) Internal wiring / bus system for the connection of all equipment. The wiring shall be neatly arranged and strapped.
- r) Input/Output (I/O) signals and contacts must be provided for monitoring by the telemetry / SCADA system. Refer Telemetry and SCADA system.
- s) Refer to the equipment and preferred products list as included.
- t) Telemetry and SCADA system

The equipment inside the control panel shall be arranged in such a manner that the telemetry system shall be easily integrated with the control/switchgear. The following minimum I/O signal count shall be provided in the control panel instrumentation section for connection to the PLC:

Power Supply:

- 12V and 24V analogue
- Mains fail
- VWC fault / Voltage fault
- Motor control panel temperature (if Air Conditioning is installed)
- PLC comms = OK
- AC protection = OK
- DC protection = OK
- Air Conditioning circuit breaker = OK
- Control circuit breaker = OK

Pump motor sets:

- Pump running / stopped / tripped (MPU, no-flow)
- Circuit breaker "ON / OFF"
- Pump selection mode i.e. Auto / Off / Manual / Telemetry
- Pump available
- Temperature trip (motors > 75kW)
- 3 x Motor winding temperatures (motors > 75kW)
- 2 x Pump motor bearing temperatures (motors > 75kW)

Variable Speed Drives (VSD's):

- Power (MODBUS)
- RPM required (input, 4-20mA)
- Actual RPM running (Output, 4-20mA), loop isolated
- Voltage link and output (MODBUS)
- Motor current (MODBUS)
- Previous trip condition (MODBUS)
- Running hours (MODBUS)

Instrumentation:

- Level sensor(s) – analogue level and instrument error
- Inlet and Outlet Pressure sensor(s) – analogue pressure and instrumentation error
- Flow sensor(s) – analogue flow, totalizer and instrumentation error

Pump station General:

- Intruder alarm
- Electrical energy meter (analogue max demand and kWh consumption, totalizer per Time-Off-Use and total, instrument error)

u) Alarms

An audible and a visible alarm shall be provided on the outside of the pump station building.

In the event of any alarm condition which will stop the pump motor (except the water level control system), both the audible and the visible alarms shall be activated. It shall only be possible to cancel the audible alarm and to reset the visible alarm from inside the control panel via the HMI interface. The visible alarm shall continue to be activated, until reset by hand from within the control panel.

v) Three-phase maximum demand kVA/kWh energy meter:

The above meter shall be installed after the main circuit breaker in the control panel, complete with CT's and wiring. This meter shall be suitable to function with VSD's and will be able to provide Time-Of-Use totals (applicable to tariff scheme) on a monthly basis.

The energy meter shall be provided with RS484 / MODBUS RTU communications port and shall be interfaced to the PLC. The energy meter shall be of the Elster Kent, Landis and Gyr or Schneider range or similar and equal approved.

- Emergency Stop

A master control relay must be provided in the control panel to de-energise all I/O circuits. The master control relay must be de-energised directly by a hard-wired emergency stop pushbutton.

w) Viewing Panel

The control panel shall be provided with a sealed plastic window in the enclosure door for observing the PLC status and I/O indicators.

x) Programmable Logic Controllers (PLC's)

A PLC shall be provided for controls. The structure of the PLC program will be presented to the Engineer before software development commences. The language used will be relay ladder logic and the descriptive language used in the program software will be in English.

Working programs shall be provided on CD/DVD, as well as printed program listings.

The programmable logic controller's shall generally comply with the following minimum requirements and shall be of the KOYO DirectLogic type 06 or 205 (depending on the application size) or similar and equal approved.

Design Description

- The controller system shall be an all-in-one design, with I/O expansion so the user can quickly and easily install, service and replace the controller and expansion modules, if necessary. The supplier must have available a number of I/O options for the controller that include:
 1. Power: 24V DC
 2. Inputs: 24V DC sink, 24V DC source, 4-20mA Analogue, 0-10V Analogue, RTD
 3. Outputs: Relay (some of which must have individual isolation), 24V DC source, 4-20mA Analogue, 0-10V Analogue and TRIAC
- The controller must be part of a larger family of packaged and modular programmable controllers that provide program transport (ability to move a customers' program between platforms in both directions), and also share programming tools, a common instruction

set, and common communications to serial-based devices (computers, electronic operator interfaces, etc.).

- All hardware of the controller shall operate at an ambient temperature of -20° to 60°C (-4° to 140° F) with an ambient temperature rating for storage of -40° to 85°C (-40° to 185° F).
- The controller hardware shall function continuously in the relative humidity range of 5% to 95% with no condensation.
- The controller shall have at least two dedicated serial ports which support RS-232-C signals. These ports must be capable of local and remote (via modem) programming, troubleshooting and data manipulation.
- The controller shall have at least one dedicated serial port which supports RS-485 signals. This port must be capable of local and remote programming, troubleshooting and data manipulation.
- The controller shall have at least one RJ-45 port which supports 10/100 Mbps EtherNet/IP. This port must be capable of local and remote programming, troubleshooting and data manipulation.
- The controller system shall be designed and tested to operate in high electrical noise environments, and must meet or exceed:
 - EN 61000-4-2 (ESD Immunity)
 - ENV 50204 (Radiated Immunity)
 - EN 61000-4-3 (Radiated RF Immunity)
 - EN 61000-4-4 (Fast Transient Immunity)
 - EN 61000-4-5 (Surge Transient Immunity)
 - EN 61000-4-6 (Conducted RF Immunity)
 - EN 55011 (Conducted and Radiated Emissions)
 - EN 61000-4-11 (Line Related Tests)

Main Hardware

- The CPU shall be a self-contained unit, and will be capable of displaying Ladder Rung program execution through its RS-232/RS-485 and EtherNet/IP communication ports. The CPU will control all I/O scanning and communications servicing.
- All components of the controller system shall be housed in a single chassis (power supply, embedded I/O circuitry, CPU, memory and communications shall reside in one enclosure).
- The CPU within the system shall perform internal diagnostic checking and give visual indication to the user by illuminating a "green" indicator when no fault is detected and a "red" indicator when a fault is detected.
- The packaged controller shall be designed to operate in a free air flow environment (convection cooling only, no fans or other air moving devices shall be required).
- The controller shall provide a simple embedded Human Machine Interface (HMI). This HMI must provide the ability to monitor/change user data and also to display messages

and data to the user. The ability to receive numeric input from the HMI which can be utilized by the controller's program must also be supported.

- The controller must provide a mechanism to manually set the communication port to a known state (factory out-of-box preferred). Systems that do not provide a mechanism to manually set the communications port to a known state are not acceptable.
- The main front panel of the controller shall include the following indicators: Power, Run, Fault and Force.
- Processor mode shall be selected by a command from a programming device. Available settings must include modes:

RUN:	Control program executing
PROGRAM:	Controller not executing, user program can be uploaded or downloaded
SINGLE SCAN TEST:	The PLC scans and solves the user program once, does NOT control the real world outputs, and stops
CONTINUOUS SCAN TEST:	The PLC continuously scans the user program, but does NOT control the real world outputs

- Non-volatile memory shall store the operating system, user program, and all user data to protect against memory loss in the case of power loss or system shut-down.

Power

- The packaged controller shall operate at 24VDC Class 2 SEL V
- All AC powered controllers with 24V DC inputs must be capable of supplying a minimum of 24V DC at 200mA to provide external 24V DC power for input devices (sensors, switches, etc.).
- The onboard power supply must be capable of supplying all necessary power to all subsystems (CPU, memory, local I/O, etc.) plus a minimum of seven expansion I/O modules without external wiring.
- In cases where the AC line is especially unstable or subject to unusual variations, it shall be possible to install a constant voltage transformer having a sinusoidal output waveform.
- At the time of power-up, the power supply shall inhibit operation of the processor and I/O modules until the DC voltages are within specifications.

Program Storage

- The program storage medium shall be a solid state non-volatile type.
- The controller shall be capable of addressing up to a minimum of 10K data words, where each word is comprised of 16 data bits.
- Available user memory shall consist of a minimum of 20K words of program and data.
- Controller shall support up to 128K bytes for data logging.
- Controller shall support up to 64K bytes for recipe storage.

- The controller must provide the capability to use a non-volatile memory module that can be inserted or removed while power is applied to the controller.
- The memory module must provide the capability to use a non-volatile memory module that can be inserted or removed while power is applied to the controller.
- The memory module must support the ability to selectively protect multiple areas of user data from being overwritten if/when a download occurs.
- Memory modules must be capable of write once read many operations. This is a write once feature that if enabled inhibits a user from clearing the program currently stored in the memory module.
- The memory module must support automatic program download whenever power is applied.
- The memory module must support the ability to detect if a fault is present during the power up sequence, if a fault is present download the program that is in the memory module and enter the run mode. If a fault is not present the controller proceeds normally without memory module intervention.
- The operator should be able to backup memory, including data and program logic onto a CD, DVD, hard disk, or memory module.
- The packaged controller system must be capable of storing the following data:
 - External output status
 - External input status
 - Timer values
 - Counter values
 - Signed integer numbers (16-bit)
 - Signed integer numbers (32-bit)
 - Binary data (bit, BCD, HEX)
 - ASCII string data
 - Internal processor status information
- The above listed data shall be distinguishable to the CPU by the addressing format. Managing the data into memory subsections shall be an automatic function of the CPU operating system. Data can be displayed in Binary, Hexadecimal or Decimal. Function-specific data such as processor status shall have dedicated displays that annotate the meaning of specific control bits and words within them and allow for selective control where appropriate.
- If contacts or entire rungs are intentionally deleted from an existing logic program, the remaining program shall be automatically repositioned to fill this void. Whenever contacts or entire rungs are intentionally inserted into an existing program, the original program shall automatically be repositioned to accommodate the enlarged program.
- The controller must support a minimum of 12 pulse inputs. Pulse inputs allow a fast signal to be captured and held long enough for the controller to detect the signal, once read the signal is automatically reset.

- The number of times that a normally open (N.O.) and/or normally closed (N.C.) contact of an address can be programmed shall be limited only by the memory capacity to store these instructions.
- Ladder logic programs must have immediate access to sub-elements of control structures (timers, counters, sequencers, etc.) by word (presets, accumulators, etc.) and bit (status bits).

Inputs/Outputs - General

- A minimum of four isolated digital input groups, one isolated analog input group, six isolated digital output groups and one isolated analog output group shall be located on the self-contained controller. At least four relays shall be individually isolated.
- The system must support at least 112 discrete I/O points using expansion I/O modules.
- Isolation shall be between all internal logical and external circuits.
- Each input and output point shall have a visual indicator to display ON/OFF status.
- All user wiring to I/O modules shall be through a heavy-duty terminal strip. Pressure-type screw terminals shall be used to provide fast, secure wire connections.
- Inputs shall have adjustable filter time constants to improve input performance in high speed applications and to limit the effects of voltage transients.
- The system must be able to support seven expansion modules (input/output, discrete or analog).

Inputs/Outputs – Specific

The controller shall offer input/output hardware consisting of the following types:

- Standard Inputs:
24V DC sink, 24V DC source, 4-20mA Analog, 0-10V Analog, RTD and Thermocouple
- High Speed Counter:
Each controller with 24V DC inputs must have at least three HSC's capable of detecting a 100kHz pulse stream built on board.
Each HSC must be capable of detecting pulses as narrow as 5 microseconds (100kHz) and directly control (turn on or off) controller outputs independent of the processor scan.
Each HSC must be cable of detecting single ended inputs, quadrature inputs and high speed inputs with external controls (hold and reset).
Each HSC must be completely configurable (input filters, modes of operation, etc.) using computer based software. Runtime control of the HSC must be allowed through commands (instructions) in the user (ladder) program (reset accumulator, change presets, change output patterns and setpoints, enable/disable HSC operation, etc.).
Data and status within each HSC must also be accessible from external devices through the controller's communication ports.

- High Speed Inputs

Each controller with 24V DC inputs must have at least 12 inputs that can catch and fold for one input's scan a 5 microsecond input signal.

Each controller with 24V DC inputs must have four high speed inputs capable of generating an input interrupt. When used for input interrupt functionality, the controller must be capable of executing a predefined range of logic. Each input must be configurable to run its own user-defined logic block.

- Standard Outputs

Outputs: Relay (some of which must have individual isolation), 24V DC source, 4-20mA Analog, 0-10V Analog and Triac.

Relay outputs for DC devices which operate at 5-125V DC, with 2 amp continuous current capacity at 24V DC and 1 amp continuous current capacity 125V DC.

Relay outputs for AC devices which operate at 5-264V AC with 5 amp continuous current capacity for UL508 up to 40°C (3A above 40°C) and 3 amp continuous current capacity for UL1604, Class 1, Division 2, Hazardous Locations, Groups A, B, C and D.

- High Speed Output

Each controller with 24V DC outputs must have at least three high speed outputs. The outputs must be capable of generating PTO (pulse train output) signals. The PTO signals must be capable of generating motion profiles using either trapezoid or S-Curve acceleration and deceleration profiles.

Networking and Communications

- The Controller shall support direct connection to a programming computer equipped with a standard RS-232 serial port.
- The controller shall support direct connection to a programming computer equipped with a standard RS-485 port.
- The controller shall support direct connection to a programming computer equipped with a standard 10/100Mbps EtherNet/IP port.
- The controller shall support direct connection to a modem for remote programming functionality.
- The controller shall support full function peer-to-peer communications (program management, controller to controller messaging, etc.):
 - When directly connected by an RS-232 cable, RS-485 cable or EtherNet cable.
 - A "local" (hard wired) peer-to-peer network that supports up to 32 devices.
 - The controller shall directly support EtherNet/IP peer-to-peer messaging..
 - The controller shall support half-duplex slave communications on a network capable of at least 250 nodes. The half-duplex network shall support program upload/download, monitoring and peer-to-peer (slave-to-slave) communications.
 - The controller shall support connectivity to up to 31 other devices across a DH-485 network.
 - The controller shall support the DF1 Radio Modem protocol.

- The controller shall support Modbus RTU master and slave communications.
- The controller shall support bi-directional ASCII communications to send initialization strings to a modem, text with embedded data to a printer or terminal, receive ASCII from smart scales, bar code devices, etc.
- The controller shall provide the ability to change the RS-232 communications port between the out-of-box factory default settings and the user configuration settings. This operation must be allowed to occur at any time.
- The controller must support baud rates from 300 to 38.4k baud.
- The controller shall support Modbus/TCP over EtherNet.
- The controller shall support DNP3 serially and over EtherNet.

Execution

- Interfacing and Peripherals
 - The programming means shall be a Microsoft Windows based desktop/portable.
 - Programming software must run on Windows 98/ME/NT/2000/2003 Server/XP or Vista environments.
 - The programming software and the controller shall support online editing.
 - The programming terminal shall be compatible for interfacing with an electrical service of either 120V AC, 50/60 Hz or 220V ACT, 50/60Hz.
 - The terminal shall provide for selecting the communication rate between 110 and 38400 baud for RS-232-C communications.
 - The programming terminal shall be capable of displaying a rung consisting of a maximum of seven series elements and six parallel elements.
 - The means to indicate contact or output status shall be by intensification or colour change of the contact or output on the CRT screen. Each element's status shall be shown independently, regardless of circuit configuration.
 - The controller system shall be able to interface with a data terminal which is RS-232-C compatible (up to 38400 baud) to generate hard copy logic diagrams and/or message generation.
 - The system shall have the capability to interface to a CD, DVD and/or a hard disk for loading a user program into, or recording the contents of, the processor's memory. It shall be possible to load or record the entire contents or selected portions of memory.
 - The controller must also have a small easy to use operator interface (OI specifically designed to enhance operator interaction with the control system. The OI device should be panel mountable. Features required are menuing capabilities, security features, active display of data, limit test of entered data, and scaling of data to and from the controller. The system should make use of intuitive on screen programming features. All OI programs must be capable of being saved to disk and transported to other OI devices or programming computers. OI programs should be transferred via a RS-232 serial communications link between the computer and the OI device.
- Programming Techniques
 - The programming format shall be relay ladder diagram.
 - It shall be possible to program a maximum instruction matrix containing as many as 128 instructions.
 - The capability shall exist to change a contact from normally open to normally closed, add instructions, change addresses, etc. It shall not be necessary to delete and reprogram the entire rung.

- It shall be possible to insert relay ladder diagram rungs anywhere in the program, even between existing rungs, provided there is sufficient memory to accommodate these additions.
- It shall be necessary to issue a two part command in order to delete ladder rungs from memory. This will provide a safeguard wherein the operator must verify their intentions before erasing the entire program.
- Latch functions shall be internal and programmable.
- The system shall have the capability to address up to 10K words of data.
- The system must support up to 255 data files. Each data file must be configurable from 1 to 255 data elements and type (timers, counters, integer [16- or 32-bit], string, message or PID) and any number of timers, counters and internal bits up to a maximum of 10K words or data.
- All management of instructions and data in memory shall be handled by the CPU. Instructions shall permit programming timers in the "ON" or "OFF" delay modes. Timer programming shall also include the capability to interrupt timing without resetting the timers. Counters shall be programmable using up-increment, down-increment or both. All timer and counter data must be accessible from the ladder program and also any communications device.
- Timer instructions shall include selectable time bases in increments of 1.0, 0.01, and 0.001 second. The timing range of each timer shall be from 0 to 32,767 increments. It shall be possible to program and display separately the timer's preset and accumulated values.
- The controller shall use a signed integer data format. The signed integer format (-2,768 to 32,767) must be used throughout the controller (counters, storage registers, math operations, etc.).
- The controller shall support signed integer math functions consisting of addition, subtraction, multiplication, division, scale with parameters and square root.
- Instructions will be provided for file manipulation instructions such as "file fill", "first in-first out", "last in-first out" shall be supported by the system. Four function math instructions and instructions for performing "logical OR", "logical AND", "exclusive OR" and comparison instructions such as "less than", "greater than" and "equal to" shall be included within the system. All instructions shall execute on either single words, double words or files.
- The system shall contain instructions for reading, writing and manipulation of ASCII data. Instructions such as string extraction, concatenation and byte swapping of data.
- The system shall contain instructions which will construct synchronous 16-word shift registers. Additional instructions shall be provided to construct synchronous bit shift registers.
- The controller shall have a jump instruction which will allow the programmer to jump over portions of the user program to a portion marked by a matching label instruction.
- The controller shall have an instruction which will allow the programmer to display a combination of bits, integers and strings to the embedded HMI and optionally to receive bits, integers or long integers from the HMI.
- In applications requiring repeatable logic rungs it shall be possible to place such rungs in a subroutine section. Instructions which call the subroutine and return to the main program shall be included within the system. It shall be possible to program several subroutines and define each subroutine by a unique label. The processor will support nesting of subroutines. The program format as displayed on the CRT shall clearly define the main program and all subroutines.

- The program format shall display all instructions on a CRT programming panel with appropriate mnemonics to define all data entered by the programmer. The system shall be capable of providing a "HELP" instruction which when called by the programmer will display on the CRT a list of instructions and all data required to enter an instruction into the system memory.
- At the request of the programmer, data contained in system memory shall be displayed on the CRT programming panel. This monitoring feature shall be provided for input/output status, timer/counter data, files and system status. Ladder logic rungs shall be displayed on the CRT with rung numbers in sequential order.
- The system shall have the capability to enter rung comments above ladder logic rungs. These comments may be entered at the same time the ladder logic is entered.
- It shall be possible to manually set (force) either on or off all hardwired input or output points. Removal of these forced I/O points shall be either individually or totally through selected keystrokes. The programming terminal shall be able to display forced I/O points.
- The execution of the program logic shall be accelerated by scanning the rung only until a positive decision as to the state of the outputs has been made. In many cases this will mean skipping over logic elements if the output condition has been predetermined.
- A means to program a fault recovery routine shall exist. When a major system faults occurs in the system, the fault recovery routine shall be executed and then the system shall determine if the fault has been eliminated. If the fault is eliminated, program execution resumes. If the fault still exists, the system will shut down.
- An interrupt routine shall be programmable such that the routine shall be executed regularly. The interval at which the routine is executed shall be user-specified in the range of 1 to 32767 milliseconds in 1 msec increments. This routine must be able to close an asynchronous control loop consisting of 32 input points, 32 output points, 100 contact/coils, 10 addition instructions, 10 subtraction instructions and 32 circular comparison (limit) instructions while never exceeding a 3 millisecond interval. The measurement of this interval is from after the input filter delay time to the time that the physical outputs start to transition.
- The ability to program ladder logic via symbols from the global database of the packaged controller shall exist.
- The CPU shall support indirect addressing of inputs and outputs, along with all data table words (integer, binary, timers and counters) for the software instruction set.
- The system shall support both bit and word level diagnostic instructions.
- To facilitate conditional event detection programming, output instructions shall include a "one shot" instruction which may be triggered on the low-to-high (rising) rung condition.
- The processor shall support Master Control Reset (Relay) type functionality to selectively disable sections of relay ladder logic.

- Quality Requirements

The controller shall be able to withstand conducted susceptibility tests as outlined in:

- ESD Immunity EN 61000-4-2
4kV contact, 8kV air and 4kV indirect
- Radiated Immunity ENV 50204
10V/m, 1000MHz

- Radiated RF Immunity EN 61000-4-3
10V/M, 26-1000MHz (alternatively 80-1000MHz), 80% amplitude modulation, 900MHz keyed carrier
- Fast Transient Immunity EN 61000-4-4
Power Supply, I/O: 2kV, 5kHz
Communications Cable: 1kV, 5kHz
- Surge Transient Immunity EN 61000-4-5
Unshielded Communications Cable: 2kV
CM (common mode), 1kV DM (differential mode)
Shielded Communications Cable: 1kV galvanic gun
I/O: 2kV CM (common mode), 1kV DM (differential mode)
AC Power Supply Input: 4kV CM (common mode), 2kV DM (differential mode)
DC Power Supply Input: 500V CM (common mode), 500V DM (differential mode)
AC/DC Auxiliary Output: 500V CM (common mode), 500V DM (differential mode)
- Conducted RF Immunity EN 61000-4-6
10V, 150kHz to 80MHz
- Conducted Emissions EN 55011
AC Power Supply Input: 150kHz to 30MHz
- Radiated Emissions EN 55011
30MHz to 1000MHz
- Line Related Tests EN 61000-4-11
AC Power Supply Input:
 - Voltage drop: -30% for 110ms, -60% for 100ms
 - Voltage interrupt: at voltage greater than -95% for 5 sec
 - Voltage fluctuation: +10% for 15 minutes, -10% for 15 minutes
 DC Power Supply Output:
 - Voltage fluctuation: +20% for 15 minutes, -20% for 15 minutes

The controller and its associated peripherals shall be listed or recognized by the following registrations: UL listed; CSA or CUL certified; CE certified and suitable for operation in Class I, Division 2, Groups A, B, C and D hazardous locations.

PS PE 10.4 Operation of Protection and Control System

- a) Motor protection for each pump motor

Each pump motor shall be protected against over voltage, under voltage, incorrect phase sequence, phase failure and thermal over current etc..
The control signals from the equipment monitoring these conditions, shall override all other control signals and stop the pump motor. Indicating lamps shall identify the type of control interrupt as specified for the alarms above.

The adjustable settings on the various motor protection units and relays and equipment shall be set on Site in accordance with the results to be obtained through the testing of the pumps.

b) Level Sensor

The level, as measured by the level sensor, shall be set in the control system to stop the pumps once the water level exceeds the setpoint value.

c) Flow Sensor

The flow signal, as measured by the flow sensor, shall be set in the control system to stop the pumps if the flow sensor activates once the sensor exceeds the setpoint value.

d) Pressure Sensor

The pressure, as measured by the pressure sensor, shall be set in the control system to activate the pump motors based on the setpoint values.

e) Manual Control

In addition to the above, control equipment shall be provided in the electrical control panel (refer to par ELECTRICAL INSTALLATION) to facilitate the following mode of operation:

When the HMI selector function on the control panel is in the MANUAL mode, the signals from the AUTOMATIC MODE shall be interrupted to enable the pumps to operate manually from the control panel.

Suitable compression glands shall be used to terminate the instrumentation cable in the sensor housing. The screen conductor shall be connected to the appropriate terminal inside the sensor.

f) Auto Control

The MCC shall be equipped with a PLC ("Koyo DirectLogic05 or 250 or similar and equal approved) for the controlling of the pump motors.

g) Provision for SCADA

Each PLC shall be able to be linked to the telemetry/SCADA system to allow monitoring and remote control (if required).

PS PE 10.5 Measurement and Payment

Supply, install, test and commissioning (location specified) Unit: Sum

The unit of measurement shall be the motor control centre, complete with cable work, and everything necessary to ensure optimal operation of the panel.

The rate shall cover all costs for labour, tools, equipment, transport and everything necessary to manufacture, test, deliver to site, install and commission of motor control centre as specified.

PS PE 11 DRAWINGS

Two draft sets of operation and maintenance manuals shall be submitted to the Engineer for approval, at least three weeks before commissioning commences. The manuals shall be in English, but standard printed documentation such as pamphlets, brochures, etc. can be in English. The manuals shall also contain a complete set of the drawings associated with the works. One copy will be returned to the Contractor not less than one week before commissioning commences, for correction and adaption on Site as necessary. Once the documentation has been corrected and adapted, three sets of the final operation and maintenance manuals shall be suitably bound and submitted to the Engineer.

PS PE 12 DEFECTS LIABILITY PERIOD

The Contractor shall guarantee the Subcontract Works against faulty workmanship and equipment for a period of 12 months from the date of issue of the Certificate of Completion.

PS PE 13 TESTING AND COMMISSIONING

The Contractor shall test and commission each pump motor to verify that the equipment performs in accordance with the requirements of the Specifications as follows:

PS PE 13.1 Hydraulically pressure test each pump, pipe and valve installation in accordance with SANS 1200 L subclause 7.3 to test pressure of 2250kPa for a minimum period of 24 hours after which period no pressure loss shall be indicated on a calibrated pressure gauge and no water leaks shall be visible.

PS PE 13.2 Test the electrical installation for continuity and insulation resistance of all electrical cables and perform all other tests required for the certificate of compliance in terms of the Occupational Health and Safety Act, Act 85 of 1993. Where required, electronic equipment shall be disconnected during these tests to avoid possible damage. The electrical subcontractor shall then issue a certificate of compliance in terms of the Occupational Health and Safety Act, Act 85 of 1993.

PS PE 13.3 Test the performance of each of the following safeguards:

- Thermal over current protection for each motor
- Under and over voltage protection
 - Incorrect phase sequence protection
- Phase failure protection
- Water flow measuring system and no flow protection relays
- High and low water pressure protection system

PS PE 13.4 Run the pumps and test for direction for rotation and verify the current drawn to set the electronic motor protection relays.

PS PE 13.5 Ascertain the pump duty point by measuring the pressure drop across the pump and verifying the flow rate on the pump curve. The Employer will supply water and power free of charge for this purpose.

PS PE 13.6 On the successful completion of all the tests, each pump station shall be commissioned and commissioning certificates completed.

PS PE 14 TRAINING OF PERSONNEL

During the commissioning of the pump stations, the Contractor shall train appointed personnel of the Employer in the operation of the pump stations and control systems. For this purpose, the draft operation and maintenance manuals shall be made available to such personnel for study. The training of personnel shall be to the satisfaction of the Engineer.

PS PE 15 CERTIFICATE OF COMPLETION

The Contract Works will only be considered to be completed and the Certificate of Completion will only be issued when all of the following conditions have been met:

PS PE 15.1 The Contract Works have been successfully tested and commissioned.

PS PE 15.2 The as-built drawings have been provided.

PS PE 15.3 The operation and maintenance manuals have been provided.

PS PE 15.4 The Employer's personnel has been trained.

PS PE 15.5 The Site has been cleared and tidied to the satisfaction of the Engineer.

PS PE 15.6 All other conditions of the Specifications have been met.

PS PE 16 QUALITY ASSURANCE

The Contractor shall be responsible for ensuring that the performance of the reservoir pumps is in accordance with the Specifications.

The governing standards for the entire installation shall be those stated by the South African laws and regulations and the latest SANS standards.

In the absence of SANS standards, the relevant BS., DIN, Japanese or American standards will suffice.

PS PE 16.1 Where foreign countries' standards are quoted in the Specifications, the equivalent standard from any country can be used provided that the Contractor can satisfy the Engineer that the standard is equal to the standard specified.

PS PE 16.2 The static equipment offered shall have a lifespan of 40 years and particular attention shall be given to the internal pipe corrosion aspect i.e. galvanising.

PS PE 16.3 The dynamic equipment shall have a lifespan of 40 000 hours and particular attention shall be given to the pump and motor bearings and seals, as well as the motor starter contacts and control relays.

PS PE 16.4 The orders for the pumps and motors, valves and the electrical control panel shall be approved by the Engineer before they are issued to the subcontractor/supplier by the Contractor.

PS PE 16.5 Workshop drawings for manufactured items i.e. the pipe work and the control panel shall be approved by the Engineer before manufacture commences.

PS PE 16.6 All equipment brought out by the Contractor shall be inspected for compliance with the order and the Specifications at the supplier/manufacture before delivery to Site.

PS PE 1 7 TERMS OF PAYMENT

Up to 90% of tender value shall be paid as progress payments when certified by Engineer.

A further 5% of tender value shall be paid on issue of the Certificate of Compliance of the Works.

A further 5% of tender value shall be paid on issue of the Final Approval Certificate.

PS PE 18 EQUIPMENT TYPE AND PREFERRED PRODUCT LIST

EQUIPMENT	GROUP	TYPE	PRODUCT
PLC's	Control	Electronic	ABB, SIEMENS, SCHNEIDER
MPU's	Protection	Electrical	ABB, SIEMENS, SCHNEIDER
Contractors	Control	Electrical	ABB, SIEMENS, SCHNEIDER
Circuit Breakers	Protection	Electrical	ABB, SIEMENS, SCHNEIDER

Touch Panel	Control	Electronic	ABB, SIEMENS, SCHNEIDER
Flow Sensors	Protection	Electronic	IFM, ENDRESS & HAUSER
Lighting & Surge Protection	Protection	Electronic	DEHNGUARD, CIPROTEK
Terminals	MCC	Electronic	PHOENIX, WEGA, IMO
Temperature transmitter (4 – 20mA)	Protection	Electronic	DELTA, IFM
Loop Isolators	Control	Electronic	DEHNGUARD
VSD's	MCC	Electrical	WEG, MOTORELLI, YASKAWA
Power Supplies	PSU System	Electrical	DELTA, IFM, IMO
Battery Protector	PSU System	Electrical	VICTRON, MEAN WELL
12VDC/24VDC Converter	PSU System	Electrical	VICTRON, MEAN WELL
Telemetry Hardware	Monitoring System	Electronic	SPECTRUM, TELEFLEX
SCADA Software	Monitoring System	Electronic	ADROIT, IGNITION
OPC Software	Monitoring System	Electronic	TELEBRIDGE
Managed Redundant Industrial Network Switches	Networking	Electronic	MOXA
Managed Wireless Access Points / Clients	Networking	Electronic	UBIQUITY, MIKROTEK
Antennas	Monitoring System	Electronic	WEBB
Masts & Towers	Monitoring System	Electronic	WEBB
RF Connectors	Monitoring System	Electronic	WEBB
Co-axial Cable	Monitoring System	Electronic	WEBB
Enclosures	Monitoring System	Electrical	PERANO, ALLBRO
Digital Radios	Monitoring System	Electronic	ELPRO
Solar Regulators	PSU System	Electronic	VICTRON
GSM/GPRS Modem	Monitoring System	Electronic	EWON

Portable & Mobile Radios	Monitoring System	Electronic	MOTOROLA
Signal Converters	Control	Electronic	MEAN WELL, IFM
Flow Meter (Electronic)	Instrumentation	Electronic	IFM, ENDRESS & HAUSER
Pressure Transducers	Instrumentation	Electronic	IFM, ENDRESS & HAUSER, WIKA
Level Sensors	Instrumentation	Electronic	ENDRESS & HAUSER, IFM
Online Instrumentation	Instrumentation	Electronic	ENDRESS & HAUSER, HACH
Online Turbidity	Instrumentation	Electronic	ENDRESS & HAUSER, HACH
Online CL Meters	Instrumentation	Electronic	ENDRESS & HAUSER, HACH
Actuators	Instrumentation	Mechanical	AUMA, DEMCA, GREYTORK, ROTORK
Flow Meter (Mechanical)	Metering	Mechanical	KENT, MEINECKE
Submersible Pumps	Pump	Mechanical	ROBOT, KSB, GRUNDFOS
Electrical Motors	Motors	Electrical	WEG, MOTORELLI, FRANKLIN

PM MECHANICAL EQUIPMENT

PM 1 SCOPE

PM 1.1 This Specification covers the general requirements for the detail design, manufacture, supply, delivery, erection, installation, testing on Site, commissioning and maintaining of the mechanical equipment specified under this Contract. The complete installation shall comply with this Specification.

General Specifications for specific items of mechanical equipment are covered by Separate Particular Specifications included in this document.

PM 1.2 Should there be any discrepancy between this specification and the Project Specification PSPM: Detail Specification for Mechanical Equipment, the requirements of the latter shall prevail.

PM 2 GENERAL REQUIREMENTS

PM 2.1 Tender information and requirements

In addition to the technical particulars to be submitted by the Tenderer as specified in the Project Specification PSPM: Detail Specification for Mechanical Equipment, the Tenderer shall submit with his Tender particulars such as outline drawings, relevant technical leaflets and brochures of all equipment offered, results of any tests on similar equipment, reference to and information on similar equipment supplied and installed by the Tenderer which have been proved satisfactory by actual use and operation, supplementary specifications and other technical information as are necessary to fully illustrate and describe the equipment offered so that a proper assessment can be made of the equipment included in the Tender.

The Tenderer shall also include with his Tender full details with regard to electrical wiring diagrams, electrical cabling and inter-connections between all electrical components to be supplied and erected under this Contract and electrical requirements of all motors, switchgear, cabling and other items to be provided by others.

All switchboards shall be tested after manufacturing in the factory under supervision of the Engineer. Provision shall be made for all relating costs of the switchboards as they are going to be manufactured outside Cape Town.

PM 2.2 Detail Design, Planning and Drawings

PM 2.2.1 Detail Design and Planning

After the award of Tender the Contractor shall be fully responsible for the detail design and drawing of all the equipment under this contract. The Contractor shall also be responsible for the programming and planning of the design, manufacturing, delivery, erecting, installation, testing and commissioning of all equipment under this contract.

PM 2.2.2 Programme and Progress

A detail Contract programme shall be submitted by the Contractor to the Engineer, for his approval, within 14 (fourteen) days after the Contractor has been notified in writing of the acceptance of his Tender. The programme shall list each scheduled equipment item and indicate periods and deadlines for:

- (a) Preparation, approval and finalization of Drawings;
- (b) Ordering Manufacturing of equipment;
- (c) Inspection and testing during manufacturing;
- (d) Delivery on Site;
- (e) Erection and installation;
- (f) Testing on Site; and
- (g) Commissioning.

The Contractor shall allocate to a senior member of his staff the responsibility to monitor and evaluate the progress of the Works in relation to the approved programme, to devise methods to overcome or prevent delay and to co-operate with the Engineer. He shall report to the Engineer and draw his attention timeously to anything, which may cause any delay in the execution of the Works.

PM 2.2.3 Contractor's Drawings

(a) Approval of Drawings

Within the time specified in the Project Specification PSPM: Detail Specification for Mechanical Equipment after the Contractor has been notified in writing of the acceptance of his Tender, and before manufacture and supply of equipment, the Contractor shall submit to the Engineer, for his approval, 2 (two) prints of all details drawings giving full dimensions and details of the mechanical equipment included under this Contract.

All drawings shall be clearly numbered and marked with equipment item numbers corresponding to the tendered Schedule of Quantities. All dimensions shown on the drawings shall be in S.I. metric units.

The Engineer may require from the Contractor further detail drawings, calculations and/or information in order to clarify features not adequately shown on the submitted drawings. The Engineer will return to the Contractor one set of the submitted drawings which will be marked "APPROVED" or marked with changes which are deemed necessary by the Engineer. The Contractor shall immediately modify the drawings and resubmit for the approval of the Engineer. The nature and date of each modification and a distinguishing symbol shall be added to the drawings.

The approved drawings shall become part of the Contract and the Contractor shall supply 3 (three) of each such approved drawing as working drawings to the Engineer.

The Contractor shall not proceed with the purchasing, manufacturing and/or acquisition of any particular mechanical equipment item, prior to the final approval by the Engineer of all drawings detailing that specific mechanical equipment item.

The approval of drawings by the Engineer as specified above shall not relieve the Contractor of any responsibility in terms of the Contract.

The Contractor shall be responsible for any discrepancies, errors or omissions in the drawings and other particulars supplied by him, whether such drawings and/or particulars have been approved by the Engineer or not, provided that such discrepancies, errors or omissions are not due to inaccurate information or particulars furnished in writing to the Contractor by the Engineer.

(b) As-built Drawings

Upon completion of the erection and installation the Contractor shall supply one set of reproducible drawings detailing the equipment as erected and installed, including complete parts lists.

The cost of drawings, calculations, reproductions etc, as set out in this clause shall be deemed to be included in the Contract Price under the item Detail Design Planning and Drawings in the

Schedule of Quantities.

PM 2.3 Manufacture, Supply and Delivery on Site at Point of Installation

PM2.3.1 Inspection and Testing at the place of manufacture and supply

The quality of materials, workmanship and performance of all items of equipment shall be thoroughly tested at the place of manufacture and supply, and test certificates, in triplicate and in the ruling language shall be submitted to the Engineer prior to the shipment, railing or transport to the equipment concerned.

The Contractor shall give reasonable notice in writing of the time and place of tests to enable the Engineer to inspect and witness tests of materials and equipment.

The acceptance by the Engineer of any plant item, following such inspection and tests at the place of manufacture and supply, shall not relieve the Contractor of any obligations under this Contract.

All cost of such tests and inspections and the necessary testing facilities shall be deemed to be included in the Contract Price under the item Manufacture, Supply and Delivery on Site in the Schedule of Quantities.

PM2.3.2 Storage

Equipment and materials to be supplied under the Contract shall, on completion of fabrication, be stored at the Contractor's factory, store or yard until it is required for incorporation in the works. The Contractor shall ensure that the items are fully protected from the weather and damage of any kind. The cost of repair of any damage shall be to the Contractor's account.

PM 2.3.3 Loading, Transport and off-loading

The loading, transport to and off-loading at the Site of all equipment and materials supplied by him shall be the responsibility of the Contractor.

Items shall be handled with proper care at all times. Sufficient labour and equipment shall be on hand before loading and unloading is commenced. Under no circumstances shall items be dropped from vehicles and large or heavy items shall be carried out under proper supervision. Ropes, chains, sling, etc. shall be attached only at the correct lifting points and care shall be taken to ensure that they cause no damage.

During transport, all materials shall be properly placed in the vehicle to prevent undue movement and coverings; padded supports, packing or dunnage shall be provided as necessary to prevent damage from either the weather or the motion of the vehicle. All packing materials shall remain the property of the Contractor and shall be removed from the Site by him.

Breakage, damage or loss in transporting, handling, etc. shall be for the account of the Contractor.

An item shall be off-loaded at a locality and on a place and time arranged with the Engineer.

All costs in connection with loading transport and off-loading of the equipment shall be deemed to be included in the contract price for Manufacture, Supply and Delivery on Site in the Schedule of Quantities.

PM 2.4 Erection, Installation, Site testing and Commissioning

PM 2.4.1 Erection and Installation

The Contractor shall supply everything required for erecting, installation and handling on Site

of the mechanical equipment. The Contractor shall supply everything required for the protection of persons on the Site, the equipment and materials supplied and the civil works during the period of erection and installation.

All equipment shall be erected by or under the direction of experienced and competent fitters. It shall be accurately placed and shall be true to line and level.

Drift pins, jacking equipment and the like shall not be used to bring improperly fabricated pipe work and mechanical equipment items into place. A moderate degree of cutting and reaming may be employed to correct minor misfits only if, in the opinion of the Engineer, this will not be detrimental to the appearance or strength of the installation. Burning of holes will not be permitted without the written approval of the Engineer.

Pipe work shall, before installation, be checked to ensure that it is in good order and condition and each item shall be thoroughly cleaned inside and outside. Any pipes showing cracks, blowholes, broken flanges or other defects shall be set aside and the Engineer called upon to determine whether they are to be repaired or replaced, all at the Contractor's expense.

Skilled and experienced pipe layers shall carry out the fitting of the pipe work. Pipes shall be fixed accurately to line and level, and vertical pipes shall be truly plumb. Rubber joint rings shall be placed without distortion and pipes drawn together without straining. No flange bolts shall be omitted and all shall be fully tightened.

On completion of erection, the Contractor shall paint or repaint all parts of the equipment, steelwork, pipe work, etc. on the Site. The colours used shall be as specified by the Engineer. The work shall be executed in accordance with this Specification.

All paintwork shall be neatly finished off, free from defects and to the satisfaction of the Engineer, or it shall be made good or removed and repainted, as required. Care shall be taken to protect other parts of the plant and structure from spillage, drips, etc., and on completion all paint marks, spots and the like on other surfaces shall be carefully removed.

On completion of erection and installation, the Site shall be cleaned of all surplus material and debris and left in a cleaned and tidy condition.

PM 2.4.2 Testing on Site

At completion of erection and installation of all mechanical equipment and before commissioning of the plant all components of mechanical installation, included in this Contract will be subjected to testing in the presence of the Engineer and to his satisfaction. All cost of such testing as outlined below and specified in the Project Specification PSPM: Detail Specifications for Mechanical Equipment shall be deemed to be included into the Contract Price.

The Contractor shall give reasonable notice in writing of the time of testing to enable the Engineer to inspect and witness tests of materials and equipment.

The Contractor shall at his own cost render all assistance and supply all labour, appliances and any other materials including power, water and chemicals, as the Engineer may require to check the setting out, to measure, inspect and test any portions of the Works at any stage during construction, erection, installation or painting. During such operations, the Contractor shall, if required by the Engineer, suspend any or all of the Works without having a claim for loss or damage as a result thereof.

At the commencement of and during the whole of the testing, the Contractor shall have available on Site all essential spares and tools considered necessary to enable repairs of defective parts to be carried out immediately in the event of a breakdown.

The Contractor shall be responsible for the proper operation and maintenance of the plant throughout the period of the testing.

Acceptance by the Engineer of any plant item, following such inspection or tests, shall not relieve the Contractor of any obligations under this Contract.

The test on Site after completion of the erection and installation of the equipment shall include the following:

- (a) All electrical and electronic equipment and installations shall be tested for correct connection, installation, insulation, losses, output, earthing and overheating, whichever may be applicable for the part or installation to be tested.
- (b) All electrical and electronic equipment and installations shall be subjected to a complete operational test to check the correct operation thereof in terms of the operational requirements specified in the Project Specification PSPM: Detail Specifications for Mechanical Equipment.
- (c) All mechanical equipment and installations shall be tested for correct positioning, alignment, fixing and all such items, which may effect the satisfactory operation thereof.
- (d) All mechanical equipment and installations shall be subjected to a complete operational test to check the correct operational requirements specified in the Project Specification PSPM: Detail Specifications for Mechanical Equipment.
- (e) Complete operational tests of hydraulic equipment shall include for effective, efficient and adequate performance of each component individually and in concert according to the operational requirements specified.

PM 2.4.3 Commissioning

At the completion of all work on the plant and after the successful testing of all civil, electrical and mechanical work the complete plant shall be commissioned. The Contractor will be responsible for the commissioning of all equipment supplied, erected and installed by him at a time arranged by the Engineer to enable the plant as a whole to be put into operation.

It is unlikely that the scheduling for the commissioning of the plant will follow directly after the completion of the erection and installation phase. The Contractor shall therefore allow for the return of site for commissioning as well as the adequate protection for equipment in the interim period between erection and installation and commissioning shall be deemed to be included into the Contract Price.

The Contractor shall at his own cost render all assistance and supply all labour, appliances and any other materials excluding power, water and chemicals, as may be required during commissioning. The Employer will supply power, water and chemicals required during the commissioning period.

At the commencement of and during the commissioning period, the Contractor shall have available on Site all essential spares and tools considered necessary to enable repairs of defective parts to be carried out immediately in the event of a breakdown.

On completion of the commissioning of equipment the plant shall be put into normal operation and the final adjustments of the equipment shall be made. Thereafter the Tests on Completion shall be carried out in the presence of the Engineer to ensure that the plant will fulfil the functions for which it has been supplied.

Such Tests on Completion shall include the following:

- (a) Simulated tests for all alarm and safety cut-out equipment to prove the operation of the equipment.
- (b) Simulated tests on automatic controls to prove the ability of the controls to rectify conditions

which are outside the required design conditions. The tests shall be carried out by manually changing the desired values to produce an incorrect condition and then resetting the controls to the design conditions and checking the operation of valves, etc. to restore the design conditions.

- (c) Operational tests on the plant to demonstrate that it is giving the rated output and efficiency.
- (d) After the Pump Station as a whole has been put into a condition of smooth operation, the Contractor shall operate it for a further 36 hour continuous test run.

The Contractor shall provide all necessary temporary measuring and recording equipment. The equipment shall be of a type generally used for this type of testing and shall be approved by the Engineer. All instruments shall be accurately calibrated before the tests commence.

On completion of the commissioning of all the mechanical equipment, and provided the Contractor is satisfied that the entire plant is operating satisfactorily and will fulfil the function for which it has been supplied, he shall submit to the Engineer duplicate copies on all the tests called for in the Specifications. The Engineer shall reserve the right to ask for any reasonable additional tests in order to prove that the operation of the plant is satisfactory and in accordance with the Specifications and Drawings.

During the commissioning and 36 hour test run, the Contractor shall train and instruct the personnel as appointed by the Employer as plant supervisors in the correct working and operation of the equipment supplied by him. The Contractor shall, however, be responsible for the proper operation and maintenance of the plant throughout the period of the testing.

The Engineer will only issue a Completion Certificate after all aspects of the commissioning procedures have been complied with to his satisfaction.

PM 2.4.4 Operating and Maintenance Manuals

The Contractor shall provide complete and adequate Operating and Maintenance Manuals in duplicate. The manuals shall be made up in book form with loose pages and shall include drawings, diagrams and cross-sectional drawings specially prepared and coloured in and marked to indicate relevant details.

The Operating and Maintenance Manuals shall be compiled in an orderly and logical manner following as far as possible the sequence below and containing at least the information indicated.

- (a) Index
- (b) Components and functions of equipment
- (c) Normal operation
- (d) Guidelines and rules for abnormal operation: low flows; high flows; emergencies; components out of operation, bypassing certain components, etc.
- e) Maintenance; routine maintenance and lubrication instructions; major maintenance; detailed instructions; list of spare parts that should be held in stock; complete schedule of all spare parts for use when ordering; address and telex, fax and telephone numbers of all equipment suppliers; technical brochures of individual items.

The text of the instructions, notations and titling of drawings shall be in English.

Draft manuals shall be available at commencement of site testing of the equipment and two copies shall be submitted to the Engineer for approval. The Engineer shall return to the Contractor one copy of the draft manual on which amendments regarded as essential have

been indicated, and which is marked "Approved in Principle".

The Contractor shall update the manuals before commissioning, and deliver two copies of the final manual to the Engineer.

No separate item for payment for Operating and Maintenance Manuals is included in the Schedule of Quantities, but payment for these will be deemed to be included in the item for "Erection, Installation, Site Testing and Commissioning".

PM 2.5 Maintenance Period

The maintenance period will commence with the issue of a Completion Certificate. The maintenance period shall be 12 months and the Contractor shall be responsible for all preventative maintenance as well as the repair of any defects and/or malfunctioning of the mechanical equipment during this period of time.

Repairs to any mechanical equipment shall be carried out promptly and at least within one week after receiving written notification from the Engineer. The Employer at the expense of the Contractor will carry out repairs if the above-mentioned conditions are not fulfilled.

The maintenance period will be extended by a proportional period of time if the mechanical equipment was not a fully operational condition for at least 10 months of the maintenance period. The Contractor shall not have any claim for interest payment on retention money, surety, etc. during such an extended maintenance period.

PM 2.6 Measurement and Payment

Measurement and payment shall be as detailed in the Project Specification PSPM - Detail Specification for Mechanical Equipment.

PM 3 GENERAL REQUIREMENTS FOR MANUFACTURING, SUPPLY, ERECTION AND INSTALLATION

PM 3.1 General

PM 3.1.1 Units of Measurements

All dimensions, masses, etc. shall be in S.I. metric units.

PM 3.1.2 Applicable Standards and Regulations

In general all material, equipment and work shall at least conform to the requirements of the below-mentioned standards, regulations and codes of practice etc.:-

The South African Bureau of Standards (SANS) standard specifications, codes of practice or methods as applicable, including CKS specifications prepared by the SANS on behalf of the Central Standardization Committee.

If applicable SANS specifications do not exist, the appropriate International Standards Organization (ISO), International Electro technical Commission (IEC), Deutsche Industry Norm (DIN), British Standards (BS) or equivalent standard, as approved by the Engineer, shall apply.

The South African Factories, machinery and Building Works Act of 1941 and the Regulations thereof as applicable, except where these contradict the above South African Ordinance and Regulations.

In the above Regulations of the S.A. Act and the South African Ordinance, the word "Contractor"

shall be read in lieu of the word "user" appearing in the Regulations, whenever applicable.

The Model Regulations for the Wiring of Premises, published according to Section 160 of the South African Municipal Ordinance of 1949.

The Standard Regulations for Wiring of Premises, issued by the South African Institute of Electrical Engineers, except where these contradict the above Model regulations.

Wherever reference is made to Standards Regulations etc., the latest editions, supplements or amendments thereof, are implied.

PM 3.1.3 Arrangements with Supply Authorities

The Contractor shall be responsible to arrange with the relevant supply authorities with regards to inspection of the installation and he shall supply all labour and equipment, at his cost, as required to conduct such inspections in accordance with the requirements of those authorities.

The Contractor shall supply and erect all notices and warning signs in accordance with the applicable laws and regulations of the relevant authorities and as specified in the Contract Document.

PM 3.1.4 Payment of Fees and Duties

The Contractor shall be responsible for the payment of all fees and duties required by law or the regulations of relevant supplier authorities with regard to the supply and installation of the equipment and to protect the Employers against any losses, claims, penalties, costs or expenditure that may arise from the Contractor's negligence to comply with these requirements.

PM 3.2 Quality Requirements

PM 3.2.1 Quality of Materials and General Design

All materials used in manufacture and erection of the equipment to be supplied shall be new of the respective classes best suited for the intended duty, and of the best quality, to the approval of the Engineer.

Moving parts shall operate reasonably silently and shall be so arranged as to be easily and readily accessible for removal, maintenance and repair. Adequate protection shall be provided, to the satisfaction of the Engineer, for the exclusion of vermin, birds and insects from all moving, enclosed or live parts and to prevent damage to insulation by vermin.

The equipment shall be of the most modern but proven design and shall conform to the applicable standards and regulations. Unless otherwise specified in this Document, or otherwise specifically agreed to by the Engineer in writing, the latest edition of the relevant South African or British Standard Specification or Code or Practice shall be applied by the Contractor for determining the minimum requirements in respect of quality of material, working stresses, safety factors and tests (such as physical-, electrical-, hydraulic- and chemical performance) as may be required to prove that the equipment or portions or parts thereof will function safely and reliably for the duties required thereof in terms of the Contract. The South African Standards, where these exist, shall take preference over the corresponding British Standards.

All fabricated components shall be stress-relieved. The Contractor shall ensure that the erected equipment shall be free from harmful vibration. The Contractor shall also ensure that all moving parts, links, rotating shafts, belt drives and similar items are adequately protected, to ensure the safety of the construction works as well as operating and maintenance personnel in compliance with the requirements of the relevant regulations. The Contractor shall provide with the equipment the necessary precautionary devices so that the equipment cannot be operated by unauthorised persons or incorrectly operated by the operating staff.

All switch units to which unauthorised persons may have access shall be provided with suitably hinged or completely removable covers with locks. All locks shall have duplicate keys and the keys shall be clearly labelled with the name of the equipment to be protected on by attaching suitable non-corrosive metal label plates. All locks or groups of locks shall be of a similar locking system and the Contractor shall also supply the appropriate master key(s) for the system(s).

Belts, bolts, nuts and of the devices for clamping and fixing of renewable parts and stainless steel parts shall be made of stainless steel. Corrosion-resisting steel shall be used for all bolts and nuts when either or both are subject to contact with water and/or frequent adjustment or removal, and for bolts projecting from concrete with nuts subject to removal. Split pins or other approved locking devices shall be provided by the Contractor for nuts, which may become loose after erection and during operation of the equipment.

All grease nipples shall be of the hexagonal hook-on type and shall, where necessary, be fitted with adaptors or bushings. The Contractor shall provide a grease gun for each appropriate type of grease to be used.

PM 3.2.2 Equipment and material to be complete

The equipment and materials to be supplied by the Contractor shall be complete in respect of all parts, fixing bolts, anchorages, controls and all other items so as to ensure a complete, adequate and satisfactory permanent installation at the site as well as the operation and maintenance thereof, even though some parts may not be listed specifically or separately in the Specifications, Drawings or Schedule of Quantities.

PM 3.2.3 Numbering and Marking of Materials, Equipment and Parts

All items of the equipment, parts and materials to be supplied under this Contract shall be clearly numbered and marked to ensure the correct assembling and erection thereof on Site.

PM 3 Spares and Tools

The Tenderer shall submit with his Tender a complete list with process of all the essential spares to be kept ready at the site to ensure continuity of operation and satisfactory maintenance of the equipment. These spares shall be supplied as part of the Contract and the prices quoted shall include for packing, for permanent storage and for protecting the spares against corrosion and damage. Larger spares may be packed individually or by grouping in adequately strong boxes with labels indicating the contents thereof for bulk storage but smaller spares shall preferably be stored in suitable steel cabinets, provided by the Contractor, which are protected against corrosion and fitted with locks.

PM 3.3.1 Interchangeability of parts

Manufacturing all parts, which may require renewal or replacement to template, gauge or jig, shall ensure the interchangeability of original and spare parts.

The Contractor shall retain all records and patterns of parts, which may require repair or replacement, for a period of at least five (5) years free of extra cost to the Employer.

PM 3.3.2 Tools, lifting devices and similar equipment

The Contractor shall supply a complete set of hardened spanners and tools and other implements necessary for the maintenance and adjustment of the equipment supplied under the Contract and the Tenderer shall submit with his tender a complete list thereof together with prices. The spanners and tools shall be mounted in suitable steel cabinets, which are protected against corrosion and fitted with locks and the position of the various spanners, and tools shall be clearly marked.

PM 3.3.3 Supply on site of spare parts and special tools

Spare parts and special tools shall be supplied on the site after successful testing and before commissioning of the mechanical equipment on site, and the tools or spare-part cabinets shall be installed in positions indicated by the Engineer. The special tools are defined as tools required for normal maintenance but to do not form part of the contents of a normal toolbox.

The Contractor shall also be responsible for the training of operational and maintenance personnel in the use of special tools if such tools are provided by him.

The costs for the installation of tools and spare part cabinets as well as the training of operational and maintenance personnel shall be deemed to be included in the items for the supply of tools and spare parts.

PM 3.4 Site Work by the Contractor

All site work necessary for the complete and satisfactory erection and operation of all mechanical and electrical equipment shall be executed by the Contractor and shall be deemed to be included in the Contract price. The Contractor shall be responsible for the delivery and storage of equipment on site and for handling and transporting thereof to positions of permanent erection or storage. The Contractor shall provide all the necessary plant and appliances for the erection of the equipment and he shall be responsible for the safety and adequacy of such erection plant and appliances.

PM 3.4.1 Holding down bolts

The Civil Engineering Contractor will leave pockets and recesses. The Contractor shall be responsible for the provision of, alignment, grouting in and tightening up of all holding down bolts.

PM 3.4.2 Pipes and other equipment through walls of structure

Holes and recesses will be left by the Civil Engineering Contractor in brick walls, floors and concrete structures to accommodate items of equipment to be built in.

The Contractor shall be responsible for the positioning, alignment, anchoring, levelling and fixing of equipment to be built in, where after grouting and making good will be carried out by the Civil Engineering Contractor.

PM 3.4.3 Excavation and backfill

Excavation, the Contractor shall carry out backfill and compaction work required in connection with the installation of mechanical and electrical equipment.

PMC PROTECTIVE COATING SYSTEMS FOR MECHANICAL EQUIPMENT

PMC 1 SCOPE

This specification covers the coating systems for corrosion protection for mechanical equipment to be installed at sewage treatment plants.

PMC 2 GENERAL

The specification covers coatings for equipment or elements of equipment operating below or above the water. As the main coating is an epoxy generic, chalking in areas of exposure to the sunlight is anticipated. For this reason an ultra-violet light resistant polyurethane enamel has been recommended as a finishing coat in these areas.

Product names quoted in this specification are Plascon products but approved equivalent products may be used.

PMC 3 STANDARD COATING SYSTEMS

PMC 3.1 Standard Coating System for equipment operating below water

PMC 3.1.1 Surface Preparation

Abrasive blast clean to Grade SA2,5 Swedish Code of Practice SIS055900-1967.

PMC 3.1.2 Coating system

Apply 4 coats of Copon EP2300 Pipecoating (Product Code JYA1/2/8) to a dry film thickness of 65 -85 micron per coat to achieve a total dry film thickness of 300 - 350 micron. Application shall be by brush, roller of preferably airless spray.

The first and third coats shall be pale oxide (JYA2) and the second and final coats red oxide (JYA1) in colour. The coating shall be applied in strict accordance with product data Sheet E-13-D with particular care being taken in respect of overcoating times.

PMC 3.2 Standard Coating System for Equipment operating above water

PMC 3.2.1 Surface Preparation

Abrasive blast clean to Grade SA2,5 of the Swedish Code of Practice SIS055900-1967.

PMC 3.2.2 Coating system

Apply 3 coats of Copon EP2300 Pipe Coating (Product Code JYA1/2/8) to a dry film thickness of 65 - 80 micron per coat to achieve a total dry film thickness of 200 - 250 micron for these 3 coats. Application shall be by brush, roller of preferably airless spray.

The first and third coats shall be red oxide (JYA1) and the second coat pale oxide (JYA2) in colour. The coating shall be applied in strict accordance with Product data Sheet E-13-D with particular care being taken in respect of over coating times.

PMC 3.2.3 Finishing coat

Apply 1 coat of Plascon Polyurethane Acrylic Enamel (Product Code CPS Series) to a dry film thickness of 35 micron. Application shall be by brush, roller or preferably airless spray.

Colour shall be to the Engineer's approval.

The coating shall be applied in strict accordance with Product Data Sheet U-8-A. This coat must be applied within 24 to 72 hours after the final coating of Copon EP2300 has been applied.

PMC 3.3 Standard Coating System for motors and gearboxes

PMC 3.3.1 Surface Preparation

Abrasive blast clean to Grade SA2,5 of the Swedish Code of Practice SIS055900-1967.

PMC 3.3.2 Primer coat

Apply 1 coat PlasconEpimide Red Oxide Zinc Chromate Primer (Product Code EPD41) to a dry film thickness of 35 micron.

PMC 3.3.3 Intermediate coat

Apply 1 coat PlasconEpiliteHifill Epoxy Primer (Product Code EPD325/326) to a dry film thickness of 40 micron.

PMC 3.3.4 Finishing coat

Apply 1 coat Plascon Polyurethane Acrylic Enamel (Product Code CPC Series) to a dry film thickness of 35 micron.

The total DFT for this system shall be a minimum of 100 micron.

NOTE: The coatings are to be applied in strict accordance with the Product Data Sheets, namely E-2-E, E-19-C and U-8-A respectively.

PMC 4 COATINGS SYSTEM SELECTION

Mechanical equipment at a sewage plant is normally designed to have a steel or concrete support structure above the water level connected to elements in the splash zone or elements under water level. The coating systems mentioned above are also applicable to the elements in the splash zone or elements extending from the support structure to under the water surface.

Where a differentiation in coating systems between submerged and non-submerged areas on the same element or item is required the non-submerged area shall receive the full 4-coat Copon 2300 system before the application of the Polyurethane finishing coat. This will obviate problems at the interface between the two different fourth coats.

The finishing coat shall be applied to all elements in the splash zone and on any area that will not be permanently submerged in water.

PMC 5 PROPRIETARY EQUIPMENT

The coating systems on proprietary equipment shall be to the Engineer's approval. Where the coating system is deemed inadequate a specially designed over coating system may be required.

PMC 6 TOUCH-UP REPAIR PROCEDURE

The following procedure shall be adopted for the repair of transport and handling damage and the coating of nuts, bolts, etc.

PMC 6.1 Degrease, using PlasconAquasolv Degreaser Product Code GIC.

- PMC 6.2 Clean thoroughly using mechanical or hand wire brushed and/or abrasive paper to remove corrosion products and any other deleterious material to achieve a bright metal surface.
- PMC 6.3 In the case of damaged coating the adjacent sound coating shall be feathered back for a minimum distance of 25mm using abrasive paper.
- PMC 6.4 Prior to application of coating, the feathered-back existing coating shall be solvent-wiped with epoxy thinners (Product Code EPT).
- PMC 6.5 Apply coating system i.e. Coating type and dry film thickness per coat as per the original specification.

PMC 7 MEASUREMENT AND PAYMENT

As all mechanical equipment will be painted the coating forms parts of the plant and no additional payments will be made for the specified coating systems. Equipment with non-approved coating systems shall be regarded as not conforming to the specifications.

PMG GROUTING OF MACHINE & STRUCTURAL EQUIPMENT

PMG GROUTING

PMG 1 SCOPE

This section covers the specification for the grouting to be done on all civil and mechanical equipment. This specification is intended to supplement or replace Clause 5.5.13 of SANS 1200G: Concrete (Structural) where applicable.

PMG 2 INTERPRETATION

The interpretation clause of SANS 1200G: CONCRETE (STRUCTURAL) and the interpretation in the applicable standards listed below shall apply

SANS 471: PORTLAND CEMENT (ordinary, rapid-hardening, and sulphate resisting).

PMG 3 MATERIALS

PMG 3.1 Water

Water for grout shall comply with the requirements given in Sub clause 3.3 of SANS 1200G.

PMG 3.2 Aggregates

Notwithstanding the requirements of Sub clause 3.4.1 of SANS 1200G, the grading of fine aggregate (sand) and coarse aggregate (stone or pea gravel) shall conform to the gradings given in Tables 1 and 2 respectively, hereafter.

PMG 3.3 Cement

Cement shall be ordinary portland cement complying with SANS 471.

PMG 3.4 Admixtures

Admixtures shall comply with the requirements of Sub clause 3.5 of SANS 1200G and shall have a proven record of satisfactory performance under conditions encountered in Namibia and shall be approved by the Engineer prior to its use.

PMG 3.5 Proprietary grouting materials

Unless otherwise approved by the Engineer, proprietary-grouting materials shall be obtained ready-mixed in sealed pocket as supplied by the manufactures.

TABLE 1 - SAND

Test sieve nominal aperture size, (mm)	% Passing (by mass)
9.5	100
4.75	95-100
1.18	46-65
0.300	5-15
0.150	0-5

TABLE 2 - STONE OR PEA GRAVEL

Test sieve nominal aperture size, (mm)	% Passing (by mass)
9.5	100
4.74	95-100
2.36	0-5

PMG 4 CONSTRUCTION

PMG 4.1 Preparation and procedures

1. Before a machine or structural bedplate is placed on the concrete the following procedure shall be followed:
 - a) All defective concrete, laitance, dirt, oil, grease, and loose material shall be removed from the concrete foundation by bush-hammering, chipping, or other means until sound clean concrete is obtained. The surface of the foundation shall be scabbled, but shall not be so rough as to interfere with proper placing of the grout. All foundation bolt sleeves shall be cut out, or cut off flush of the sleeves cannot be removed. The top of the foundation shall re-shaped if necessary.
 - b) The underside of each steel base, particularly in the bearing areas, shall be cleaned and any burra and ragged edges removed before the base is placed in its final location.
 - c) All holding-down bolt sleeves shall be thoroughly cleaned of any materials that may prevent the grout from flowing freely to the bottom of the bolt sockets.
 - d) The base shall be properly aligned and levelled and shall be maintained in that position during grouting.
2. After the machine or structural bedplate has been placed the following precautions shall be observed:
 - a) Shimming shall be kept to a minimum. Steel plates shall be used for packing and shall be ground to the required thickness, where necessary.
 - b) Before grouting is started all loose dirt, oil, grease, and other foreign matter on the surface of the foundation, the undersides of bedplates, and in the bolt holes shall be removed by means of compressed air or other approved means. The surface of the foundation slab shall be thoroughly saturated with clean water, and all free water shall be removed from the surface and the bolt holes just before the grout is placed.
 - c) Grouting shall not be carried out until the alignment of all units to be routed has been checked and approved by the Engineer.
 - d) Special care shall be taken with grouting in hot or cold weather to ensure proper

setting and gain of strength and, in the case of proprietary grouting materials, by having ice or hot water available, as the case may be, in accordance with the instructions of the manufacturer. Enclosures shall be provided for the grout such that, until it has set its temperature will be in the range 15 - 27°C. Shields to protect the grout from the sun and from hot winds shall be provided by the Contractor when so ordered.

PMG 4.2 Formwork

Formwork for grouting shall comply with the applicable requirements of Sub clause 5.2 of SANS 1200G: CONCRETE (STRUCTURAL). Forms shall be caulked where necessary. Adequate clearance between forms and bedplates shall be provided to enable the grout to be worked into place.

PMG 4.3 Mixing (all free-flowing grouts except epoxy grouts)

The grout shall be mixed to a homogeneous uniform mixture and delivered ready for placing at a temperature between 15°C and 25°C.

The materials and water shall be mixed in a mortar for at least 3 minutes. In the case of small jobs, the grout shall be thoroughly mixed by hand, the entire mass being turned over enough times to ensure even distribution of the components.

The mixing shall be done as close as possible to the place(s) where the grout is placed. No more grout shall be mixed at any one time than can be placed in a period of 20 minutes. After grout has been mixed it shall not be retempered by the addition of water.

PMG 5 APPLICATION

PMG 5.1 Grouting(all free-flowing grouts except epoxy grouts)

The grout shall be placed quickly and continuously to avoid the undesirable effects of over-working. (These effects are segregation, bleeding, and breaking-down of initial set). The method of placement shall be subject to approval. The means of placing the grout shall be such that the grout will completely fill the space to be grouted, will be thoroughly compacted, will be free of air pockets, and will have evenly distributed contact over an area in excess of 80% or, in the case of expanding grout, 95% if the bearing area of the item to be supported.

Wherever practicable, grout shall be placed from one side only and where this is not practicable, care shall be taken to ensure that any entrapped air is released.

After grout has taken initial set,

the forms shall be removed;

- ii) excess grout shall be so cut away as to leave a smooth and neatly finished job;
- iii) except where the grout is intended to provide resistance to side thrust, all edges shall be trimmed at 45° to the vertical, from the bottom edge to the bedplate; and
- iv) all excess grout on or about the bedplates shall be removed.

Damage to paintwork, if any, shall be repaired within 24 hours. Packing plates, shims, and other levelling devices shall remain in position.

PMG 5.2 Dry-packed grout (standard dry sand and cement grout)

Dry-packed grout shall have a minimum compressive strength at 28 days of 20 MPa. The quantity of water added after placing shall be kept to a minimum consistent with placing

conditions, and the cement, sand and, where applicable, pea gravel proportions by mass shall be as follows:

- i) Where the clearance between bedplate and foundation is 25mm or less: 1 part of portland cement, and 2 parts of sand;
- ii) Where the clearance exceeds 25mm: 1 part of portland cement, 1 part of sand, and 1 part of pea gravel.

Dry-packed grout shall be rammed by means of tamping rods against formwork placed along three sides of the bedplate.

PMG 5.3 Non-shrink grout with metallic aggregate

The manufacturer's instructions shall be observed when non-shrink grout with metallic aggregate is used.

Where the clearance between the bedplate and the foundation is less than 50mm a sand based mix shall be used. Where the clearance exceeds 50mm the Engineer may order a mix with a base of sand plus pea gravel to be used.

PMG 5.4 Expanding grout with powdered aluminium additive

The manufacturer's instructions shall be observed when an expanding grout with powdered aluminium additive is used. Where the clearance between the bedplate and the foundation is less than 25mm, a sand-based mix shall be used.

Where the clearance exceeds 25mm the Engineer may order a mix with a base of sand plus pea gravel to be used.

Each batch shall be mixed for at least 6 min after the powdered aluminium has been added. Where a ready-mixed grout is used, the powdered aluminium shall be added at the placing site and the batch mixed as specified in PMG-4.3 above. Grout shall be placed within 45 min after the addition of the powdered aluminium.

The Contractor shall not use powdered aluminium additive when the ambient temperature is below 5°C.

PMG 5.5 Epoxy grout (epoxy mortar type only)

The manufacturer's instructions shall be observed when an epoxy grout is used.

PMG 6 TESTING

The Contractor shall, where so ordered, carry out a site test for each grouting procedure and each grouting gang to be used. The tests shall be carried out on a dummy bedplate similar in configuration to that, which is to be grouted, but not exceeding 1m² in area unless otherwise ordered. When the dummy bedplate is dismantled, the underside shall show a minimum grout contact area of 80% with reasonably even distribution of the grout over the surface grouted except that, in the case of expanding grout, the minimum grout contact area shall be 95%. The test shall show evidence of good workmanship and materials and results shall be to the satisfaction of the Engineer.

The Contractor shall, when so ordered, make standard test cubes from various grout mixtures and subject them to compression tests to determine whether the specified strength has been achieved. Test procedures shall comply with the relevant requirements of Sub clause 7.2.1 - 7.2.3 of SANS 1200G.

PMG 7 MEASUREMENT AND PAYMENT

Payment for grouting of machine bases and structural bedplates is included in the prices tendered for mechanical equipment to be installed. In the case of nominated subcontracts the Principal Contractor shall be responsible for grouting of machine and equipment supplied by the Nominated Subcontractor.

PMM MOTORS

PMM 1 SCOPE

The specification covers AC induction motors intended for the mechanical equipment on water treatment installations. The properties and limitations of the motors are given as follows:

- a) Power ratings generally do not exceed 200 kW.
- b) Supply voltages generally do not exceed 400V.
- c) Operating environments can range from indoor to outdoor and other situations where a severe risk of corrosion, and dust and water ingress is present.

PMM 2 STANDARDS

All electric motors shall comply with the following relevant standard specifications:

SANS 948: "Three phase Induction Motors"

BS 2613: "Electrical Performance of Rotating Electrical Machinery"

BS 5000 Part 99: "Machines for Miscellaneous Applications"

PMM 3 GENERAL

PMM 3.1 Cage motors with a high starting torque shall have specially arranged rotor winding to ensure a high starting torque and a moderate starting current.

PMM 3.2 Cage motors shall be suitable for direct on line, star-delta or liquid-resistance starting unless otherwise specified.

PMM4 RATINGS

The following factors shall be taken into consideration when determining the rated output of the motor:

PMM 4.1 All motors shall be suitable to deliver the full-load output continuously.

PMM 4.2 The continuous maximum rating of the motor shall be 10-15% greater than the requirement to allow for the tolerance of 105% - 115% of over current protection equipment tripping characteristics as specified in BS 4941.

PMM 4.3 All starting times, independent of the load characteristics or method of starting shall be limited to 20 seconds.

PMM 4.4 All motors shall be suitable for a minimum of ten on-load starts per hour with the specified starting method without the temperature limits of the insulation being exceeded unless otherwise specified. Furthermore, the motor shall be suitable for the number of starts per hour specified for the normal load and operating conditions. The manufacturer shall stipulate the maximum number of starts per hour during the system-commissioning period and it must be noted that more starts per hour than specified above may be required for this period.

PMM 4.5 Motor ratings chosen unnecessarily in excess of the driven load requirements with a resultant low power factor and low efficiency will not be accepted.

PMM 4.6 The starting torque and the speed-torque characteristics of the motor shall be carefully matched to the load characteristics to obviate stalling and/or crawling. The maximum torque developed by the motor in the final operating condition (i.e. when the starting cycle has been completed and starters have been switched out of circuit) shall be at least 1,6 times the full-load torque to

accommodate temporary voltage and load fluctuations.

- PMM 4.7 The actual ambient temperature under which the motor will operate and not only the ruling outdoors air temperature shall be considered.

NOTE: The motor manufacturer shall liaise closely with the driven load equipment supplier to ensure that a suitably rated motor is provided. The motor manufacturer shall submit together with the tender a written guarantee that the motor performance is suitable for the specified load and operating conditions.

PMM 5 PERFORMANCE CHARACTERISTICS

- PMM 5.1 The Tenderer shall submit calculations proving that the starting and run-up time shall be less than 20 seconds. The following formula shall be used for the purpose:

$$T_e = (T_1 - T_2) / n(T_1 / T_2) \text{ and } t = NI / (9.55 T_e)$$

T_e = equivalent acceleration torque in Nm

T_1 = maximum acceleration torque in Nm

T_2 = minimum acceleration torque in Nm

I = moment of inertia of all rotating parts of both the motor and driven load in kgm^2

N = final rotational speed in rpm

T = run-up time in seconds

n = natural-logarithm

- PMM 5.2 Torque-speed characteristics for both the motor and driven load shall be submitted together with the tender.

PMM 6 ENCLOSURES AND DEGREE OF PROTECTION, METHODS OF COOLING AND MOUNTING ARRANGEMENTS

- PMM 6.1 The enclosures and degrees of protection shall conform to the requirement of the IP code as stipulated in SANS 948.

- PMM 6.2 The cooling arrangements shall be in accordance with the IC code as stipulated in SANS 948.

- PMM 6.3 Mounting arrangements shall be in accordance with the mounting designations as stipulated in SANS 948. The specific designation for each motor shall be determined in liaison with the driven load equipment supplier.

- PMM 6.4 The enclosure shields and mountings of totally enclosed surface cooled motors shall be manufactured of cast iron, which complies with BS 1452. Allowance must be made for condensate to drain from the motor.

- PMM 6.5 The motor design shall be suitable for the mounting arrangement.

PMM 7 INSULATION

- PMM 7.1 All motor windings shall be insulated to Class F or better. The maximum temperatures of the windings as determined by the increase in resistance are as shown in Table PMM 1.

TABLE PMM 1: MAXIMUM TEMPERATURE OF WINDINGS

Insulation Class	Temperature in °C at Altitude above sea level					
	0-1000 m	1000-1200 m	1200-1400 m	1400-1600 m	1600-1800 m	1800-2000 m
E	115	112.6	111.2	109.8	108.4	107.0
B	120	118.4	116.8	115.2	113.6	112.0
F	140	138.0	136.0	134.0	132.0	130.0
H	165	163.7	162.5	161.2	160.0	158.7

The above values are in accordance with the requirements of SANS 948 and BS 2613 for a maximum ambient temperature of 40°C. For higher ambient temperatures and where heaters are installed in the motors, the above values shall be reduced as described in the SANS and BS specifications.

PMM 7.2 All windings shall be varnish-impregnated and baked. The insulation shall be protected against dust, oil and high humidity.

PMM 7.3 End windings shall be thoroughly braced and supported to obviate movement and damage due to vibration.

PMM 8 BEARINGS

PMM 8.1 Wherever possible pre-lubricated and sealed ball or roller bearings shall be provided. In the event of unsealed bearings they shall be so designed to minimise lubrication to not more than once per year.

PMM 8.2 Bearings shall be protected against eddy current which may occur.

PMM 8.3 Bearings shall be suitable to withstand vibration due to reciprocating or unbalanced loads.

PMM 9 TERMINALS

PMM 9.1 Winding terminals shall be clearly marked U, V and W or as applicable.

PMM 9.2 All winding terminals shall be brought out to a suitably sized terminal box.

PMM 9.3 Vulcanised rubber insulation of the conductors connecting the windings with the terminals shall not be acceptable.

PMM 9.4 An earth terminal shall be provided on the motor frame in a suitable location.

PMM 9.5 Terminals shall be totally enclosed in a watertight terminal box. Terminal boxes shall be complete with packings, bolts, nuts, locknuts, washers, etc. The degree of protection shall not be less than IP 55.

PMM 9.6 Terminal boxes shall be adequately sized to accommodate all cables to be terminated in the boxes and to ensure that the cable cores can be terminated with suitable lugs without exceeding the bending radii of the cables.

PMM 9.7 Cable outlets shall be so designed to be positioned to point in any of four directions at 90 degree intervals.

PMM 9.8 Terminal boxes shall be positioned on the right hand side when viewed from the driveend of the motor unless otherwise specified.

PMM 10 ROTATION

- PMM 10.1 The direction of rotation shall be clockwise looking on shaft end and with the supply phases R-W-B connected to terminal U-V-W.

PMM 11 TEMPERATURE PROTECTION

- PMM 11.1 All motors with a rating of 25 kW and more as well as all motors with a rating of 15 kW and more subjected to run-up times in excess of 15 s, shall be provided with temperature protection by means of thermistors installed in the stator windings.
- PMM 11.2 Six thermistors, two per phase, shall be installed. The thermistor tails shall be brought out to a terminal box and shall be clearly marked. Three thermistors, one per phase, shall be connected in series for normal operation and the other three shall be spare.
- PMM 11.3 The thermistors shall be located at the winding "hot spot" and for this application the "Curie Point" shall be 15°C above the temperature values specified above.
- PMM 11.4 Only thermistors of the Positive Temperature Coefficient (PTC) type shall be used.
- PMM 11.5 Thermistors shall withstand a test pulse voltage of 2 kV for all motor supply voltages up to 600V. Additional insulation shall be provided for motors with a higher supply voltage.
- PMM 11.6 Those portions of the thermistor leads, which are bedded in the windings, shall be protected against mechanical damage with a varnished "terylene" or fibreglass sleeve. Care shall be taken to ensure that this sleeving does not cover the thermistor itself.
- PMM 11.7 The thermistors shall be so bedded in the winding to ensure the most efficient heat transfer.
- PMM 11.8 All leads from the thermistor to the control unit shall consist of twisted pairs to minimise the influence of voltage interference. Shielded cables shall be used where the control unit is located more than 10 m away from the motor.
- PMM 11.9 Isolating transformers shall be used to protect the control panels against high voltage resulting from a short circuit between the thermistors and windings.

Water Ingress Protection

All submersible pump motors shall be provided with water ingress protection.
 All non-active motor detector products shall be fitted in the oil housing between pump and motor.
 All leads from the detector shall be suitable for the intended application.

PMM 12 HEATERS

- PMM 12.1 Anti-condensation heaters shall be fitted with motor windings for all motors under the following conditions:
- Direct coupled motors and pumps for cooling water systems.
 - Standby motors in cooling installation where the ambient temperature may reach dew point.
 - Motors serving pumps in humid atmospheres where motors do not work continuously.
 - In atmosphere with a relative humidity in excess of 95%.
 - All outdoors motors in excess of 22 kW.
- PMM 12.2 Heaters shall be so arranged to avoid moisture reaching terminals and exposed conductors.

PMM 13 ENVIRONMENTAL CONDITIONS

Where the environmental conditions are in excess of the maximum conditions defined by SANS 948 the motor ratings and insulation shall be derated. The Tenderer shall supply full details of the derating factors applied to determine the available output at the given ambient temperatures and altitudes in excess of 40°C and 1000 m respectively. Details shall also be provided of the increased impregnation and bake applied to the windings for relative humidity in excess of 95%.

PMM 14 DUTY

The duty of the motor shall be classified in terms of SANS 948, duty designations S1 to S6.

PMM 15 STARTING CLASS

The starting class shall be defined, as the maximum permissible number of starts per hour and distinction shall be made between complete starts, jogs and electrical braking.

It is assumed that one jog is thermally equal to 25% of a complete start and one reverse current braking operation to one third of the rated speed is thermally equal to 80% of a complete start. The applicable starting classes shall be as shown in table PMM 2.

TABLE PMM 2: STARTING CLASSES

Starting Class	Starting					Cyclic Operation
	Equivalent Starting Duties					Per cent duty factors to be combined with the starting class (%)
	No of Starts per hour	No of jogs per hour	No of breakings to one third of rated speed per hour			
150	150	+	0	+	0	25, 40, 60
	100	+	200	+	0	
	65	+	130	+	65	
300	300	+	0	+	0	40, 60
	200	+	400	+	0	
	130	+	260	+	130	
600	600	+	0	+	0	60
	400	+	800	+	0	
	260	+	520	+	260	

PMM 16 DOCUMENTATION

PMM 16.1 Copies of routing and performance test certificates in accordance with SANS 948, BS 2613 or BS 5000 shall be submitted to the Engineer before delivery of the motors.

PMM 16.2 The manufacturer's guarantee that the motor shall meet the required load demand shall be submitted together with the tender.

PMM 16.3 Torque-speed curves for the motor and associated pump shall be submitted together with the tender.

PMM 16.4 Operating and maintenance manuals shall be provided to the Engineer before handing over of the installation.

PMM 17 TESTS

The Engineer shall be notified at least 14 days prior to any tests in order that the Engineer or his authorised representative may witness these tests.

PMN MOTOR STARTERS

PMN 1 SCOPE

This Specification covers starters for AC induction motors described in Section PMM, and is intended to operate in the same range of environmental conditions.

The starter includes the following types:

- (a) Direct-on-line starters
- (b) Star-delta starters
- (c) Soft starters
- (d) Variable Speed Drive (VSD)

PMN 2 STANDARDS

PMN 2.1 Starters shall comply with the specified requirements, the requirements of the Local Supply Authority and the requirements, of the specific system.

PMN 2.2 Contactors and starters shall comply with the relevant parts of SANS 60947, SANS 60470, BS 5424 or VDE 0660 Section 14, or IEC 158 categories AC3 except in cases where a plugging duty is required in which case category AC4 shall apply. In cases where level switches or similar ON-OFF controls are required, inherent time lags or other protection methods shall be incorporated in the control circuitry to inhibit chatter or shuttle switching of the contactor at the change-over point.

PMN 3 ISOLATION

It shall be possible to isolate electrical driven mechanical equipment by means of either of the following:

PMN 3.1 An isolator on the motor.

PMN 3.2 A starter with a positive hand operated switching-off control, which complies with the requirement of an isolator mounted within 2 m of the equipment. The connection terminals where the submersible cable of the pump motor is connected, will be regarded as part of the equipment or motor.

PMN 3.3 Where the starter is located further than 2 m away from the motor a separately mounted load-break isolator shall be installed within a distance of 2 m from the motor. The isolator shall be capable of interrupting the current of the motor with a stalled rotor. Alternatively, a cut-out push-button control may be mounted within 2 m of the motor provided that the starter control switch is lockable in the "OFF" position and that this arrangement is acceptable to the supply authority.

PMN 3.4 In addition to the above, each circuit shall be provided with a load break isolator, circuit breaker or combination fuse switch on the control panel. These switches shall be capable of interrupting the current of a motor with a stalled rotor.

PMN 4 STARTING CURRENT LIMITATIONS

PMN 4.1 The starting method shall comply with the requirements of the Local Supply Authority.

PMN 4.2 The starting current of each individual motor shall not contribute to a larger peak system current than the largest peak current, which will result when the largest motor is started combined with the full-load currents of all the motors, which are consecutively started in the same system.

PMN 4.3 Starters, other than direct-on-line starters, shall be interlocked to prevent direct-on-line starting after a supply voltage failure.

PMN 5 DIRECT-ON-LINE (D.O.L) STARTERS

- PMN 5.1 D.O.L. starters may be used for motors with ratings in excess of 3 kW provided that:
- a) the starting current limitations are not exceeded; and
 - b) this method is admissible with regard to the driven load.
- PMN 5.2 D.O.L. starters shall be suitable for at least 15 starting operations per hour except where a plugging duty is required in which case the starters shall be suitable for at least 40 operations per hour.
- PMN 5.3 In cases where the motors are not required to start and stop frequently, i.e. S1 duty, electrically controlled circuit-breakers with over-current, anti-single phasing and under voltage protection may be used as D.O.L. starters.

PMN 6 STAR-DELTA STARTERS

- PMN 6.1 Star-delta starters used to start motors with a capacity in excess of 50 kW shall have a code transition change-over in accordance with the "WAUCHOPE" resistor system. The resistors shall be sized to limit the change-over current to less than the maximum peak currents specified.
- PMN 6.2 Star-delta starters including resistors, shall be capable of at least 15 operations per hour. For inching duties the starters shall be capable of 40 operations per hour.
- PMN 6.3 Time relays controlling the star-delta starters with uninterrupted change-over shall be of the break-before-make type with a quick break action. These relays shall be of the 'SPRECHER AND SCHUH" RPZ 2-21 type.
- PMN 6.4 Star-delta starters shall be electrically interlocked via normally closed contacts on the contractors.
- PMN 6.5 The control circuits of star-delta starters with uninterrupted changeover shall be controlled with one relay only for the change-over control function. To protect the resistors an additional control relay, which will disconnect the supply current when the resistor currents persist for a longer period than the predetermined period, may be provided.
- PMN 6.6 A "policeman timer" shall be provided on all star-delta starters with uninterrupted change-over in addition to the change-over control relay to disconnect the load when the maximum allowable starting period is being exceeded. The operating mechanism of this relay shall differ from the star-delta control relay e.g. electronic versus electro-mechanical. In the case of two-wire control systems the "policeman timer" relay shall latch out with hand resetting to prevent repeated on-off switching of the starter.
- PMN 6.7 Thermal overload protection shall be connected to the motor supply and not the main supply unless otherwise specified.

PMN 7 SOFT STARTERS

- PMN 7.1 This specification covers the performance, functional specification, fabrication details and installation of digital solid state low voltage soft starter used for starting and stopping, motor control and motor protection of AC induction motors.
- PMN 7.2 The minimum requirements for the acceleration control is:
- The initial output voltage shall be adjustable between 30-70% of nominal voltage.
 - Current limit shall be adjustable between 100% and 500% of full load current.
 - The ramp time shall be adjustable between 1 and 90 seconds.
 - Kick start function shall be available with time adjustable between 0 and 1 second.
- PMN 7.2 The minimum requirements for deceleration control is:
- End voltage shall be adjustable between 30-70% of nominal voltage.

- The ramp time shall be adjustable between 1 and 90 seconds.
- PMN 7.3 Motor and load protection integrated into the starter shall include:
- Over load protection for Class 10, 20 and 30.
 - Adjustable Current limitation to 700% of full load current.
 - A system to prevent nuisance tripping during the starting cycle.
 - Provision for manual or automatic resetting after a trip.
 - A system for allowing the motor to cool down before restarting after a trip.
 - Phase lost, imbalance or reverse phase protection.
 - Over and under voltage protection.
 - Under load protection adjustable between 40 and 100% of normal load and trip time adjustable up to 30 seconds.
 - Built in Soft starter overload protection to protect the thyristors exceeding the loading as well as heating.
- PMN 7.4 A stop and start input as well as two programmable inputs, and three programmable output relays must be available.
- PMN 7.5 Operator interface shall be via a keypad and a LCD character display and English as the communication medium. Data should be actual values with standard unit of data (i.e. V, A or %).
- PMN 7.6 Provision for serial communication shall be provided via a Field Bus Plug capable of least MUDBUS communication protocol.
- PMN 7.7 At least the last 10 events, fault messages or fault history shall be saved in a non-volatile memory for access by field personnel.
- PMN 7.8 The soft starter shall be designed and tested to withstand the under the following environmental conditions without derating:
- Temperature of 40°C
 - Altitude up to 1000m above sea level
 - Humidity up to 95%RH non-condensating
- PMN 8 VARIABLE SPEED DRIVES (VSD)**
- PMN 8.1 This specification covers the performance, functional specification, fabrication details and installation of Variable Speed or Variable Frequency drives used for starting and stopping, motor control and motor protection of AC induction motors.
- PMN 8.1 The Contractor shall be responsible to ensure that the VSD, the motor and the power supply are fully compatible to operate as a system.
- PMN 8.3 The VSD hardware should comply with the following:
- Each VSD must be suitable for separate cooling of the heatsink and forced air cooling
 - Each VSD must include hardware necessary to produce the proper waveform while minimizing nuisance faults and the effects of harmonics.
 - Output section shall consist of Insulated Gate Bipolar Transistors (IGBT'S) throughout the entire range.
 - VSD control must be microprocessor based and include surface-mount technology.
 - Modbus rtu interface protocol.
 - IP 54 enclosure protection
- PMN 8.4 The VSD must operate within the following parameters:
- Ambient temperatures up to 50°C
 - Humidity up to 95%rh non-compensating.
 - Input voltage: VSD must be designed for 400V three-phase input.
 - Allowable voltage fluctuation: + 15%, - 15%.
 - Input frequency: 50hz.

- Allowable frequency fluctuation: +5%, -5%
- Carrier frequency: field adjustable from 2.5-15 KHZ to optimize the motor's operation and acoustical noise level.
- Output frequency: 0.1HZ-120HZ. Must be able to set output frequency limits to ensure safe operation.
- Output voltage: must be able to set to ensure safe operation.
- Overload capability: 120% for one minute.
- 24 hour per day continuous operation.
- The total voltage harmonics must be less than 3%.
- The total current harmonics must be less than 5% of the rated current.
- Speed stability must be within 1% of the set value

- PMN 8.5 The VSD shall have the following control features:
- VSD shall have two analog inputs: one capable of accepting a 0-10V signal and the other a 0-10V or 4-20mA signal.
 - VSD shall also have a power supply that can be used to power a 2-10Kohm potentiometer.
 - Selection of the analog input can either be made through the keypad or from a remote contact closure.
 - Bias and Gain functions must be available to adjust and fine-tune the drive speed based on the analog input signals.
 - Digital inputs for speed reference shall include up to 4 selectable preset speeds and jog speed.
 - At least two analogue outputs must be provided. They must be switchable from 0-10v and 4-20mA.
 - RS485 Serial Communication must be standard.
 - The current limit must be adjustable, from 10-200% of the VSD's rated current, to match the motor's operational capability.
 - Speed Search selectable between "search from maximum freq." or "set freq." when starting into a rotating motor.
 - Selectable PID control with adjustable parameters for maintaining a setpoint in a closed loop system.
 - Three skip frequencies with an adjustable bandwidth of up to +-25.5HZ to avoid mechanical resonance.
 - DC injection with selectable "time at start," "time at stop" and "injection current" to control motors rotation. Automatic torque boost to ensure tripless operations and power savings during acceleration and at constant speed.

- PMN 8.6 The following protective features must be included in the VSD:
- Stall Prevention during acceleration and during constant speed with each having an adjustable current limit from 30-200% of the drive's rated current. This will minimize nuisance overload to ensure continuous operation.
 - Stall Prevention during deceleration to minimize nuisance overvoltage trips due to the motor's back-EMF.
 - Frequency reference loss detection with the ability to run at 80% of last speed.
 - Power loss ride-through with either a selectable time of 0-2-0 seconds or until control power is depleted.
 - Automatic restart selectable from 0-10 attempts with the option of outputting a fault contact during the retry procedure.
 - Electronic motor protection with a thermal memory.
 - VSD and motor earth fault and short circuit protection.
 - Reverse phase, loss of supply and loss of phase protection.

- PMN 8.7 Operator interface must include the following:
- Keypad with a LCD character display.
 - English as communication medium with actual values and standard units of data.

- Saving the last 10 events, fault messages or fault history in a non-volatile memory.
- Provide elapsed operating time and kWh readings.

PMN 9 GENERAL

- PMN 9.1 All starters shall be housed in well-ventilated sections of the motor control centre or shall be housed in well-ventilated cubicles if separately mounted. Ventilation openings shall be backed with 1,5 mm copper or brass mesh. Forced cooling shall be provided where justified by the starter resetting or where the ambient temperature exceeds 40°C.
- PMN 9.2 Time relays shall be adjustable and the maximum time range shall exceed the starting time requirements.
- PMN 9.3 All starters shall be provided with "ON" and "OFF" control mechanisms with resetting facilities as required by the system. Two-wire control systems shall be fitted with hand resets to prevent shuttle switching.
- PMN 9.4 Magnetic over current trips or short-circuit protection relays shall not trip starting contractors but circuit-breakers.
- PMN 9.5 Where isolators are provided in the motor supply circuit between the starter and the motor, electrical interlocking shall be provided via a secondary contact on the isolator to trip the starter when the isolator is opened.
- PMN 9.6 One ammeter shall be provided on each motor circuit. The ammeter scales shall be suitable for the full-load current and shall provide for starting currents by means of condensed over current scales in accordance with the stipulations of BS 89. The ammeters shall also be capable of withstanding an over current of 40 times full load current for one second. During normal operation the ammeter pointer deflection shall be 50% - 70% of the full scale. Ammeters shall be of the "PCI" FA 21 x 72 mm or equal.
- PMN 9.7 Starters shall have a suitable quantity of secondary contacts to accommodate circuits for interlocking, alarm, indicating, holding, etc. For control circuits with supply voltages of 220V or 110V standard contacts are acceptable but for control circuit voltages of 50V or less the secondary contacts shall have a sliding or forked action.
- PMN 9.8 Where the starter contactor cannot accommodate the quantity of secondary contacts required an additional auxiliary relay shall be provided. The auxiliary relay shall be controlled by the secondary contacts of the main contactor. For three-wire control systems, the holding contact of the control circuit shall be supplied via contacts of the auxiliary relay to ensure that the circuit trips if either the main contactor or the auxiliary relay fails.
- PMN 9.9 All starters shall be clearly labelled to show their functions and ratings.

PMO MOTOR PROTECTION SYSTEMS

PMO 1 SCOPE

This specification covers the motor protection systems required for the Motors described in PMM and for the Starters described in PMN.

PMO 2 GENERAL

PMO 2.1 Unless otherwise specified standard protection shall be as indicated in Table PMO-1:

TABLE PMO 1: STANDARD PROTECTION OF MOTORS

Type of Protection	Application
Thermal Overcurrent	All motors
Magnetic Overcurrent	As short-circuit protection only when coupled to circuit-breakers
Thermistor Temperature Protection	All motors with rating excess of 25 kW
Anti-Single Phasing	All three-phase motors with HRC fuse protection
Earth fault	Only when condensation can occur in motors eg. standby or direct coupled cooling pump motors or outdoor motors
Reverse Phasing	All circuits supplying centrifugal compressors or reciprocating compressors or circuits where reverse phasing can cause damage
Undervoltage	Statomatic starters, resistors Starters
Temperature protection mechanisms	All motors
Electronic motor protection units	All motors

PMO 3 OVERCURRENT PROTECTION

PMO 3.1 Over current protection of motors shall be provided in accordance with the requirements of BS 587. Over current protection shall comprise thermal trip mechanisms or relays, which are coupled to contactors, hand operated starters or circuit breakers. HRC fuses shall not be regarded as over current protection.

PMO 3.2 In the cases where over current protection forms an integral part of the starter, the protection shall comprise a temperature compensated bi-metal thermal element which is directly heated by separate heating elements in each phase and which is coupled in series with the load. The over current protection shall be adjustable over a range of 75% to 120% of the full load current of the motor.

PMO 3.3 Motors subjected to frequent starting and stopping duties or to inching may be protected against over current with magnetic over current protection with a time delay provided the motor is suitable for the method of operation.

PMO 3.4 Magnetic over current tripping devices shall not trip starting contactors but shall be coupled to circuit-breakers with suitable breaking capacities.

PMO 3.5 Adequate protection shall be provided against extended overloads, but, unnecessary tripping during starting shall be prevented. For this condition short-circuiting of the over current protection, increased over current settings or connection of the over current protection to the delta circuit only in star-delta starters is not acceptable.

PMO 4 ANTI-SINGLE PHASING PROTECTION

PMO 4.1 Anti-single phasing shall form an inherent part of the over current protection unit in the case of integral motor starters.

PMO 4.2 Protection methods which rely on the over current only which may occur during single-phase conditions are not acceptable.

PMO 5 SHORT CIRCUIT PROTECTION

Refer to Project Specification PS PE for requirements of short-circuit protection.

PMO 6 THERMISTOR PROTECTION

PMO 6.1 Thermistor protection shall be provided as specified under the Quality Specification for motors.

PMO 6.2 Thermistor control units shall where possible be integrated with the motor starter.

PMO 6.3 Thermistor protection shall not be used in lieu of over current protection.

PMO 7 REVERSE PHASING PROTECTION

PMO 7.1 Reverse phasing protection shall be provided as stipulated under Clause PMO-2 and no all bi-directional motors where specified.

PMO 7.2 The sensing of reverse phasing shall be done at the outgoing terminals of the motor supply.

PMO 8 COMBINATION AND ELECTRONIC MOTOR PROTECTION UNITS AND RELAYS

PMO 8.1 Motor protection units similar or equal to "ABB, ZEV and Siemens type or similar and equal approved .

PMO 8.2 All units and relays shall be mounted in withdrawable panel-mounted enclosures.

PMO 8.3 Motor protection units and relays shall not be connected to current transformers used for metering purposes.

PMO 8.4 All protection relays shall be provided with test terminal blocks for testing of relays, CT's, etc. and shall be of the ABB Entrelec or ADO type or similar and equal approved.

PMP PUMPS

PMP 1 SCOPE

This Specification covers the general requirements for the manufacture, supply, erection, installation, testing and commissioning of pumps. The application, performance and special requirements of the pumps are covered under the Project Specification PSPM: DETAIL SPECIFICATION FOR MECHANICAL EQUIPMENT.

This Specification is applicable to pumps in the following applications:

- clean water pumps;
- sewage pumps;
- sludge pumps;
- activated sludge or humus pumps; or
- chemical transfer pumps.

PMP 2 MANUFACTURE OF PUMPS

PMP 2.1 Centrifugal pumps

(i) Type of pumps

Only high-quality centrifugal pumps will be accepted. The pumps shall be of a well-known make, so that parts will be easily obtainable over a long period of time.

In all applications, with the exception of clear water pumps, non-clogging impellers must be used. For pumping of raw sewage or sludges the pump sleeve should be resistant to high wearing due to the possible presents of grit in the liquid phase.

(ii) Materials

The pump sleeves of centrifugal pumps shall be manufactured of high-grade cast iron in accordance with BS 1452 Grade 10 or better. The other materials shall be as follows:

Pump sleeve - high-grade cast iron
Shaft - chromium steel
Shaft bearings - phosphor bronze
Impeller - bronze and or stainless steel
Adaptor sleeves - bronze
Seals - "Super Jet"

(iii) Pump design

Pumps shall be statically balanced to prevent end thrust not only when the pump is new but after wear and tear has taken place.

Pumps shall be so designed that the impeller cover can be removed without moving the pump, engine or motor.

Each pump shall have a drip tray with a 20 mm diameter galvanised drainpipe to the nearest drainage point.

On the label (prior to being affixed to the pump) shall be punched in capital block letters of 5 mm height the following information for example:

Treatment works name: e.g. BREEDE RIVER PUMP STATION
 Function: e.g. BOOSTER PUMP
 Duty: e.g. H = 105 m
 Q = 150 l/s

PMP 3 ERECTION AND INSTALLATION OF PUMPS

PMP 3.1 Footplates for pumps

Each pump with its motor shall be mounted on a single sturdy footplate. The footplate shall have suitable openings for filling in with cement mortar and for affixing foundation bolts. Each unit shall be accurately placed according to the dimensions shown on the Drawings or prescribed by the Engineer. Footplates shall be painted with a zinc chromate primer and a glossy grey enamel topcoat to the Engineer's satisfaction.

PMP 3.2 Alignment of pump, motor and pipes

All pipe work shall be supported in such a way that the inlet and outlet of the pump shall not be subjected to pressures that might disturb the alignment. The pipes shall remain in their precise positions whether bolted to the pump or not. Vertical flanges shall be welded to pipes and adaptors to ensure accurate alignment of the piping.

Before filling with cement and before bolting the flanges to the pump, the Engineer will inspect the installation. The Contractor shall obtain his written approval of the alignment between pump and pipes before proceeding, but such approval does not absolve the Contractor of his responsibility for the correctness of the system.

Once the foundation bolts have been finally tightened and all suction and outlet pipes finally positioned and bolted, the axial and radial alignment of pump and motor shall be minutely checked and, if necessary, adjusted. The alignment shall be so accurate that no vibrations will occur. The alignment shall also be within the limits set by the manufacturer; and the deviation measured at the circumference of the movable coupling, shall in any case not exceed the following values:

Pump RPM	Amplitude of Vibration (mm)
400	0.075
800	0.050
1 200	0.033
1 800	0.013

When the alignment has been tested and accepted by the Engineer, each pump and each motor shall be supplied with two permanent marks to indicate its correct position. The Contractor shall supply all equipment and measuring apparatus required for adjusting the alignment.

PMP 3.3 Installation of pump systems

All pumps, pipes and fittings shall be accessible. If the Contractor observes that any item will be inaccessible for maintenance or operation, he shall point this out to the Engineer before installing the item.

The installation shall comply either the requirements of the Factories Act, (Act No 6 of 1983). For example, all moving parts shall be screened off and high valve wheels shall be supplied with a step. No-one will be permitted to stand on pipes in order to reach valve wheels.

Pumps shall be installed in such a way that they can be removed with ease. A sufficient number of flanged joints shall therefore be provided; no long, unwieldy lengths of pipe shall be accepted. Even in the case of short lengths care shall be taken that pipes are not, for instance, so embedded in concrete that they cannot be completely removed.

All pipes shall be supported in such a way that they remain accurately in position against the pump whether flange bolts have been tightened or not. Before placing a firm order for the materials required under this section, the Contractor shall ensure that the items he orders will for the dimensions and layout shown on the Drawings.

PMV VALVES

PMV 1 SCOPE

This section covers gate, hydrant, air, reflux, butterfly and float-activated control valves for use in medium-pressure pipelines.

PMV 2 INTERPRETATION

The interpretation clause of SANS 1200 I: Medium-Pressure Pipelines and the interpretation clauses in the applicable standards listed below, shall apply:

- a) SANS 144 - Cast-iron Single-Door Reflux Valves
- b) SANS 192 - Cast-steel Single-Door Reflux Valves
- c) SANS 200 - Copper Alloy Ingots and Casting
- d) SANS 664 - Cast-iron Gate Valves for Water Works

PMV 3 MATERIALS

PMV 3.1 General

Valves shall be capable of withstanding the applicable test pressures specified in Clause PMV-7. All valves shall be supplied complete with couplings and jointing material.

Unless otherwise stated all valves shall be supplied with operating caps.

Satisfactory temporary end covers shall be provided to protect threads, flanges and prepared ends of valves from damage during transportation and handling on Site.

Valves shall be so transported, stored and handled as to prevent damage. valves damaged in any way shall be removed from the Site.

PMV 3.2 Durability of Valves

The valves shall be suitable for use in the specific application and all materials utilised in the construction of the valves shall be resistant to corrosivity of the operating environment.

PMV 3.3 Gate-valves

a) General

All gate-valves shall comply with the requirements of SANS 664 and shall carry the SANS mark.

The valves shall be cast-iron fitted with non-rising spindless and the ends shall be double-flanged.

b) Direction of Rotation

The direction of spindle rotation for valve closing shall be clockwise.

c) Class of Valves

The class of valves shall be PN16 (1,6mPa).

Gate-valves shall be capable of being opened and closed under an unbalanced pressure equal to be maximum working pressure of the class of valve specified.

d) Valve Trim

Gate-valves shall be of the resilient seal type with the gate seal constructed of neoprene. The spindle shall be stainless steel, and the body spheroidal graphite iron with machined faces.

e) Guides and Seals

The sealing and gate guide areas shall be designed to eliminate deposits in the valve body.

The valve shall be provided with a lock-seal permitting the replacement of spindle seals under pressure.

The spindle seal shall consist of at least two O-rings located in a corrosion-resistant housing. A wiper-ring to prevent ingress of dirt shall be provided.

The gate guides shall be of substantial design to support the gate until the point of closure.

The valves shall be drip-tight from zero to maximum working pressure under test and field conditions.

f) Auxiliary Fittings

Valves of 300 mm diameter and larger shall be fitted with the following auxiliary fittings:

(i) Drain Plugs

300 mm diameter valves and larger shall be supplied with gunmetal drain-plugs screwed into the lowest point of the valve and the valve body shall be suitably drilled and tapped to accept the drain-plug. The plug must be in position when the test pressure is applied.

(ii) Ball Bearing Thrust Collars

300 mm diameter valves and larger shall be fitted with ball-races on the top and bottom of the thrust collars. The ball-races shall be totally enclosed in a grease packed cover, which shall be sealed to prevent the egress of grease. Provision should be included for lubricating the ball-races and the lubrication arrangement shall allow for regreasing while the valve is under pressure.

g) Flange Drillings

Flanges shall be drilled and bolted in accordance with the requirements of tables 1000/3, 1600/3, 2500/3 and 4000/3 of SANS 1123.

PMV 3.4 Air Valves

a) General

Air valves shall be cast-iron bodied of either the single or double-orifice ball type.

The design of the valve shall be such as to preclude the loss of water or the possibility of the ball being blown shut by the passage of air when the accumulation of air in the pipeline is being released.

The valves shall also be positive in action to admit a free and full supply of air when the pipeline is being emptied or when operating conditions demand.

In the case of double air valves, the small orifice shall provide specifically for the automatic release of air accumulating under working conditions whilst the large orifice shall automatically discharge air during filling of the pipeline and completely ventilate during emptying.

b) Working Pressure

The working pressure rating of the air valves shall be to suit the application.

c) Isolating Valves

Air valves shall be provided and supplied complete with isolating valves entirely reliable in operation for the shutting down of the air valve for its complete inspection and removal and replacement of the balls or other parts as required.

- (i) In the case of double-orifice air valves, the isolating valve shall be separate and shall be incorporated on the inlet stem to the valve. The isolating spindle is provided with a spindle cap.
- (ii) In the case of single-orifice air valves, the isolating valve shall be of gun-metal and shall be incorporated on the inlet stem to the valve.
- (iii) The direction of rotation of the isolating valve shall be clockwise closing.

d) Outlet Orifices

The outlet orifices of air valves shall be fitted with gun-metal bushes.

e) Balls

The design of the balls and the materials used in their manufacture shall be such as to be completely corrosion-resistant and that they will suffer no distortion at the specified test pressure.

f) Flanges

Flanges shall be to the dimensions and drilled in accordance with table 1000/3 and/or 2500/3 of SANS 1123 to suit working pressures.

PMV 3.5 Reflux Valves

a) General

Reflux valves shall be flange-ended and shall comply with the requirements of SANS 144, Cast-Iron Single-Door Reflux Valves or SANS 192 Cast Steel Single-Door Reflux Valves as applicable and shall bear the SANS mark.

b) Class of Valve and Body

The working pressure and class of valve shall be in accordance with Table PMV-1.

TABLE PMV 1 : REFLUX VALVE CLASS AND WORKING PRESSURE

CLASS	MAXIMUM WORKING PRESSURE	BODY CONSTRUCTION
10	1.0 MPa	Cast iron
16	1.6 MPa	Cast iron
25	2.5 MPa	Cast steel
40	4.0 MPa	Cast steel
100	10.0 MPa	Cast steel

c) Flange Drillings

Flanges shall be drilled and bolted in accordance with the requirements of table 1000/3, 1600/3 or 2500/3 of SANS 1123 as applicable. Precision bolts and nuts are not required.

d) Valve Trim

The trim of reflux valves shall be as follows:

- (i) Cast-Iron Reflux Valves shall have stainless steel trim;
- (ii) Cast Steel Reflux Valves shall have stainless steel seats and stainless steel hinge pins.

PMV 3.6 Butterfly Valves

a) General

Butterfly valves shall be of the double-flanged, lugged or wafer type.

b) Opening and Closing

The direction of spindle rotation for valve Closing shall be clockwise.

All valves shall be capable of being opened or closed under an unbalanced pressure equal to the design pressure without any difficulty. The disc shall close with a positive action with no possibility of slamming shut during any stage of the closing operation and the valve shall be capable of operating at any opening without variation of disc position or flutter of the disc.

c) Class of Valve

The class of valves shall be PN16 (1,6mPa).

d) Valve body

The valve body shall have integral hubs for housing shaft bearings and seals.

The valve body shall have integral disc over travel stops to prevent the disc from rotating in the wrong direction and to protect the seat from damage if actuators are incorrectly adjusted.

e) Discs

Valves of Class 16 (1.6 MPa) and greater shall have offset and eccentric discs to provide uninterrupted 360° seating and to prevent the disc edge from rubbing against the seat in the top and bottom of the shaft areas.

The disc shall be a single casting having a streamlined shape with smooth continuous surfaces so that good hydraulic stability is assured even in turbulent flows.

f) Seals and seats

Seals shall be of the resilient type with non-weathering, non-sticking, long life properties. The profiles of the seats shall be smooth and continuous and shall provide adequate "lead in" for the resilient seal during closure of the disc to prevent excessive seating torque requirements.

Resilient seals shall be fully locked-in, removable and replaceable. All securing elements shall be of stainless steel. Valve seats shall be readily removable and replaceable on site.

g) Shafts

The disc shafts or stub-shafts shall be of high-strength stainless steel or equivalent and shall be attached to the valve disc by means of stainless steel securing elements. Shafts shall be continuous or may be of the stub-shaft type. If of the stub-shaft type, each stub shaft shall extend into the disc hub for a distance of at least 1.5 times the shaft diameter.

All keys, dowel pins and taper pins used to attach the shaft to the disc shall be mechanically

secured. The shaft shall be so sealed that the only two wetted parts shall be the dish and seat.

h) Bearings

Class 16 (1.6 MPa) valves and up or valves with diameter of 350 mm or bigger shall be fitted with two-way adjustable thrust bearings in order to permit precise disc-to-seat positioning at all times.

Positive bearing retention shall also be provided so that the bearing will not shift under operating conditions.

The valve shall be capable of being installed and operated in any position.

The bearings shall be of the self-lubricated type.

i) Stuffing boxes

Stuffing box assemblies shall be such that the packing can be adjusted or replaced under pressure without removing the valve from the pipeline.

j) Actuators

Actuators shall be enclosed in weatherproof enclosures.

Actuators shall be self-locking and capable of holding the disc in any fixed position for any extended period of time.

Safety measures (such as shear pins) shall be built into the actuator in order to prevent damage to the valve if excessive force is applied to the hand wheel in the fully open or closed position.

All actuators shall be equipped with position indicators, adjustable travel stops and indications of the "open" and "closed" positions.

The gears shall be grease-lubricated with grease-nipples located on the outside of the enclosure.

k) Flange Drillings

Flanges shall be drilled and bolted in accordance with the requirements of the relevant table of SANS 1123.

PMV 3.7 Level Control Valves

a) General

This specification is applicable to all altitude and float-actuated control valves. The valves shall be of the globe pattern, hydraulically operated by a pilot-controlled diaphragm, which in turn operates a separate resilient sealing disc. Actuation shall be by remote pilot float valve.

b) Main Valve Design

The main valve shall have a single renewable seat on which the sealing disc operates.

If applicable to the valve design the diaphragm assembly containing a valve stem, shall be fully guided at both ends and shall be the only moving part of the valves. The two bushes (bearings) on the spindle, which locate the diaphragm assembly, shall be securely locked in position, and not simply pressed in.

No external packing glands shall be permitted.

lines. All necessary repairs shall be possible without removing the valves from the

All outgoing and incoming pipes from and to the cover shall be provided with stopcocks so that the cover can be isolated from the rest of the system.

The valve shall be supplied complete with an opening and closing speed control to prevent the occurrence of any high pressure in the pipelines due to surge arising during the opening and closing cycle of the valve.

c) Pilot Valves

(i) Float-actuated Control Valves

The float mechanism shall be located remotely from the main valve inside the reservoir where a stilling well shall be provided around the float.

Strainers incorporated within the valve shall protect all pilot valves.

Control of level differentials shall be achieved merely by setting stops on the float rod. A range of 1 metre shall be provided for.

(ii) Altitude Valves

The piping for sensing the water level in the reservoir shall be as specified in the Project Specifications or/and shown on Drawings. The valve installation includes all piping between the valve and the point of measurement as well as the installation of the valve and piping. The piping shall be adequately protected to prevent any damage to them.

Strainers incorporated within the valve shall protect all pilot valves.

(d) Valve Operation

The valve shall open fully when the water level reaches a predetermined low point and shut drip tight when a predetermined high point is reached.

The Contractor shall adjust the valve to open and close at the levels given on the drawings or/and specified in the Project Specification.

(e) Materials of construction

(i) Main valve:

Body	-Close grained cast-iron or Epoxy Coated Carbon Steel
Main valve trim	-Brass, bronze or epoxy coated carbon steel
Pilot control	-Bronze
Pilot control trim	-Stainless steel 303
Orifice plate	-Stainless steel 303
Diaphragm, seating rings or sleeves	-Rubber

(ii) Float control:

Float -Non-corroding plastic or stainless steel
Float linkage and float rod -Brass and PVC or stainless steel
Base plate-Brass

(iii) Connecting Pipes:

Copper with brass fittings or stainless steel

The above materials are specified for the valves and float control and Tenderers may tender for other standard materials if those specified are not available, in which case Tenderers shall state in detail where their offer deviates from the materials specified.

PMV 3.8 Finish

All cast-iron parts, except flange faces shall be thoroughly cleaned and an epoxy primer applied, followed by one or more coats of high-build epoxy material to give a total dry film thickness of at least 250 microns applied in conformity with the manufacturer's recommendations.

PMV 4 PLANT

In the assembly and coupling up of valves correct tools and spanners of the correct sizes designed for the functions they are to fulfil shall be used. The indiscriminate use of pipe-wrenches will not be permitted and any fittings damaged by the use of incorrect tools shall be removed from the Site.

PMV 5 CONSTRUCTION

The applicable clauses of SANS 1200 L: Medium Pressure Pipelines shall apply unless otherwise stated in the Project Specifications.

PMV 6 TOLERANCES

The dimensional tolerances specified in the applicable standard specifications shall apply.

PMV 7 TESTING

The testing of the various valves shall be in accordance with the relevant SANS specifications 144, 664, 192 and 128 for the works test.

Once installed in pipelines, the valves shall be subjected to the same hydraulic tests and pressures specified for the field tests in SANS 1200 L Clause 7

C3.5 Annexures

ANNEXURE A: DRAWINGS

ANNEXURE B: PRESTANK – WATER STORAGE

ANNEXURE A: DRAWINGS

Drawing Number	Title
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CIVIL DRAWINGS

2302582/C/02	Proposed Upgrades Portion 1 & 2
2302582/C/100	Locality Plan
2302582/C/101	Nameboard Detail
2302582/C/103	Pumpstation Layout, sections & details
2302582/C/104	Pumpstation Chambers

ARCHITECTURAL DRAWINGS

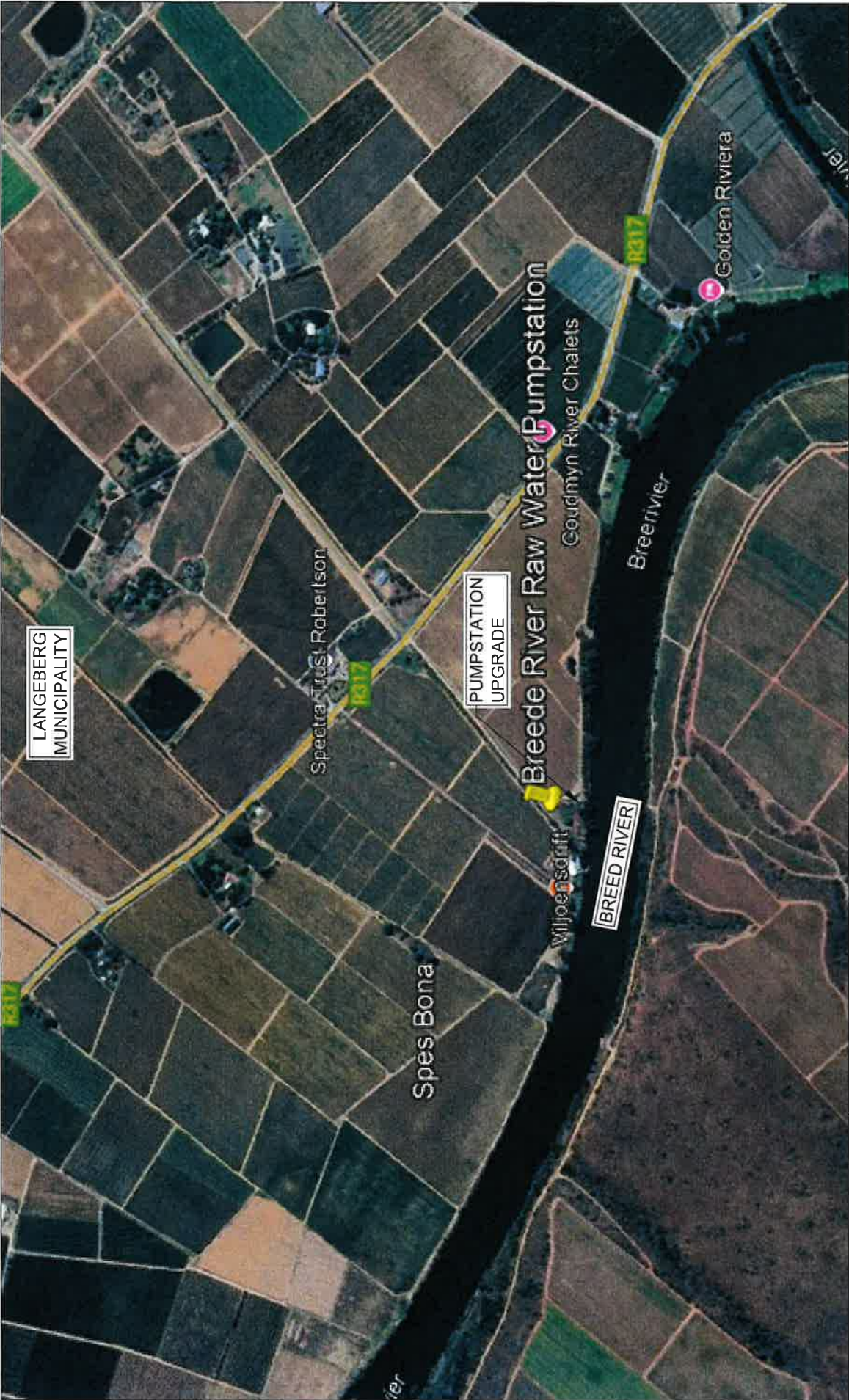
SD1 – 100	Pumpstation Building Floor Plan
SD1 – 301	Pumpstation Building Sections

ELECTRICAL DRAWINGS

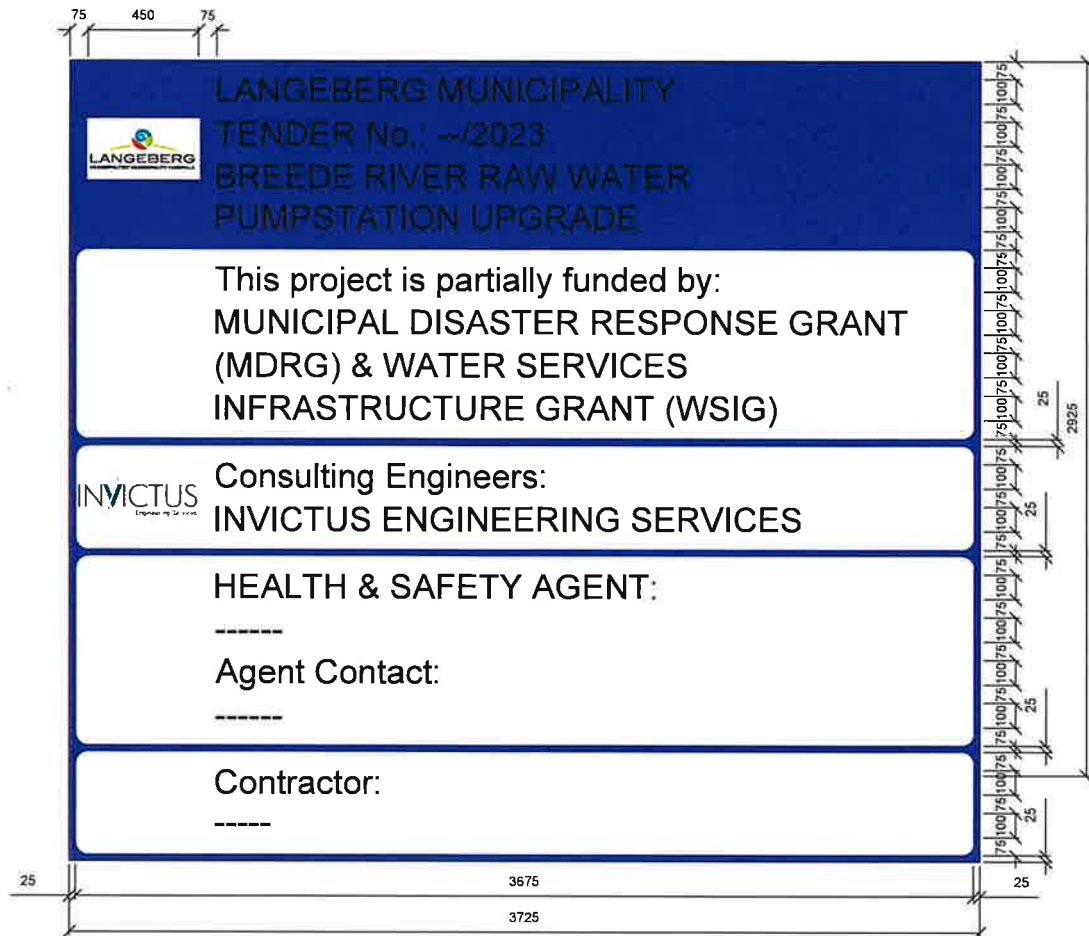
2302582/E/001	Pumpstation Electrical Reticulation
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Scale: 1" = 10' 0"		ORIGINAL SIZE A2	
NTS			
Title: ASHTON BULK WATER SUPPLY PUMPSTATION UPGRADE			
Client/Engineer: LANGE BERG			
Project: ASHTON BULK WATER SUPPLY PUMPSTATION UPGRADE			
Plan Description: PROPOSED UPGRADES PS SITE PLAN PORTION 1 & 2			
Drawing No: 2302582			
Revision: A			
Contract: 2302582			
Contractor: LANGE BERG			
Contractor's License No: 2302582			
Contractor's Address: 1000 10th Ave SW, Suite 100, Grand Rapids, MI 49503			
Contractor's Phone: (616) 230-2582			
Contractor's Email: info@langeberg.com			
Contractor's Website: www.langeberg.com			
Contractor's Fax: (616) 230-2582			
Contractor's DPO: 2302582			
Contractor's PO: 2302582			
Contractor's SPO: 2302582			
Contractor's CPO: 2302582			
Contractor's EPO: 2302582			
Contractor's FPO: 2302582			
Contractor's GPO: 2302582			
Contractor's HPO: 2302582			
Contractor's IPO: 2302582			
Contractor's JPO: 2302582			
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Contractor's YPO: 2302582			
Contractor's ZPO: 2302582			

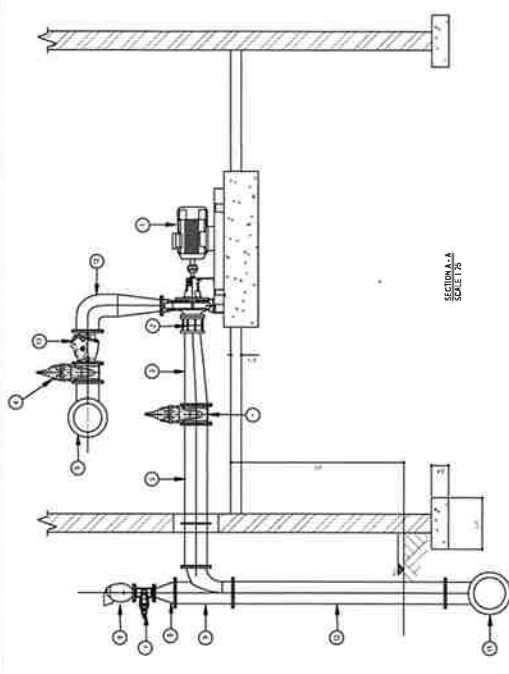


	LANGEBERG MUNICIPALITY				Drawn	Checked	Reviewed	Scale	NTS	Original Size A3
	BREDE RIVER RAW WATER PUMPSTATION UPGRADE				Drawn	Checked	Reviewed	Scale	NTS	Original Size A3
	LOCALITY PLAN				Drawn	Checked	Reviewed	Scale	NTS	Original Size A3
					Drawn	Checked	Reviewed	Scale	NTS	Original Size A3



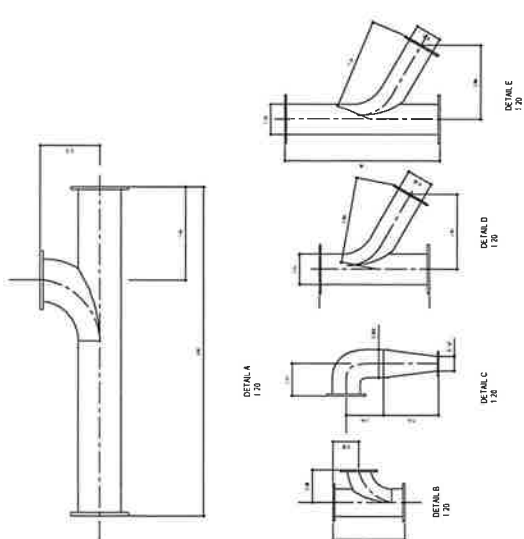
NOTES:

1. SIGN MATERIALS
 - 1.1. CONSTRUCTION
 - 1.1.1. SIGN BOARD TO BE MADE OF 1.0mm THICK RUST RESISTANT CHROMADECK WITH SUFFICIENT BRACING TO PREVENT WARPING
 - 1.2. SIGN FACE COLOURING, MADE WITH ADHESIVE MATERIALS AS PER MANUFACTURER'S SPECIFICATIONS
 - 1.2.1. PRIMARY BACKGROUND = OXFORD BLUE MATT FINISH CLASS SM
 - 1.2.2. SECONDARY BACKGROUND = WHITE MATT FINISH CLASS SM
 - 1.2.3. BOARD TITLE LETTERING = WHITE MATT FINISH CLASS SM
 - 1.2.4. OTHER LETTERING = BLACK MATT FINISH CLASS SM
 - 1.3. FONT TYPES
 - 1.3.1. FONT = HELVETICA MEDIUM (SIZES AS SHOWN ON THE LAYOUT)
2. THE SIGN BOARD IS TO BE MOUNTED ON A STRONG SUPPORTING WOODEN OR STEEL STRUCTURE, APPROVED BY THE ENGINEER.
3. THE SIGN MUST BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD TO ENSURE THAT IT REMAIN ERECTED AND CLEAN.



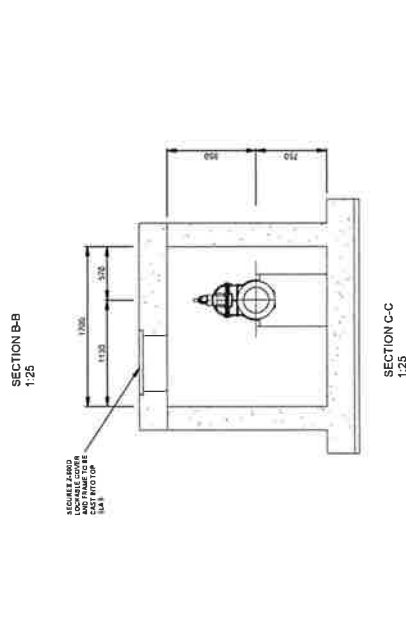
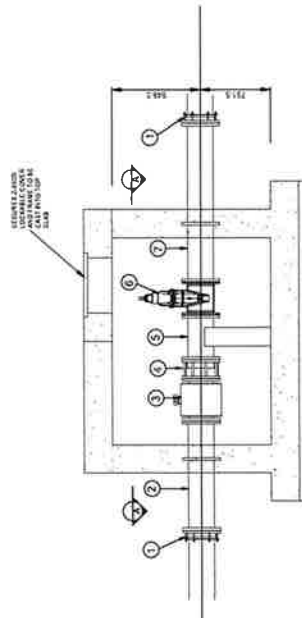
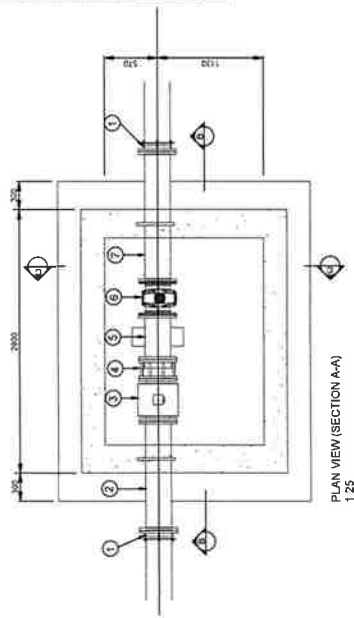
PIPE SCHEDULE: STORAGE	
DESCRIPTION	QUANTITY
Ø500mm DISTANCE PIECE FIB. PS1, A=5000	4
Ø250mm 90° BEND FIB. PS13 A=150mm	4

PIPE SPECIALS: OTHER		QUANTITY
DESCRIPTION		
100mm X 40mm FLANGE ADAPTOR		2
100mm X 40mm FLANGE ADAPTOR		2
100mm X 40mm FLANGE ADAPTOR		2

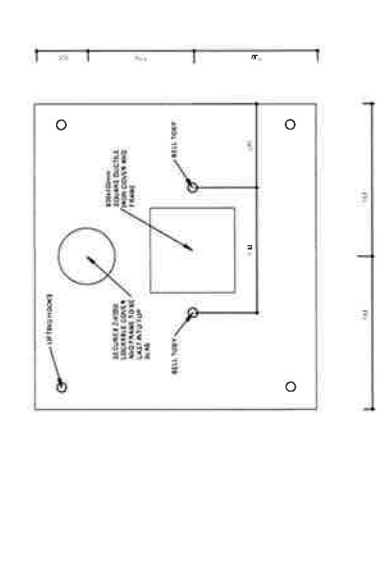
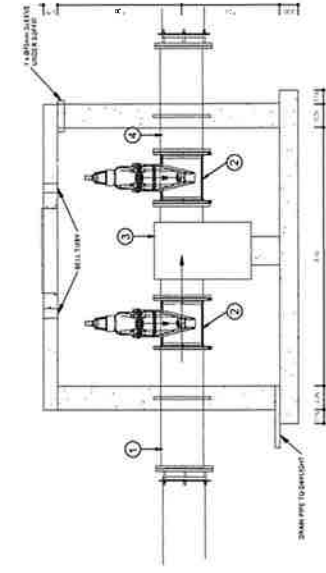
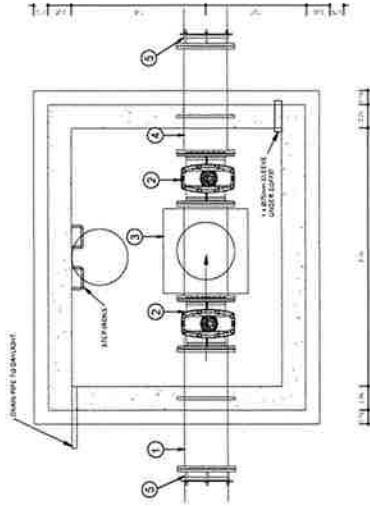


INVICTUS
Engineering Services

PIPE SCHEDULE: FLOW METER CHAMBER		
NO	DESCRIPTION	QUANTITY
1	Ø350mm FLANGE ADAPTOR	2
2	Ø350mm PUDDLE PIPE / FIB. / P3, A: 1170mm, B: 418mm	1
3	Ø350mm FLOW METER	1
4	Ø350mm DISMANTLING JOINT	1
5	Ø750mm DISMANTLING PIPE / FIB. / P3, A: 470mm	1
6	Ø350mm GATE VALVE	1
7	Ø350mm PUDDLE PIPE	1



PIPE SCHEDULE: STRAINER CHAMBER		
NO	DESCRIPTION	QUANTITY
1	Ø350mm PUDDLE PIPE / FIB. / P3, A: 1480mm, B: 120mm	1
2	Ø350mm GATE VALVE	2
3	Ø750mm GASKET STRAINER	1
4	Ø350mm PUDDLE PIPE / FIB. / P3, A: 1170mm, B: 350mm	1
5	Ø350mm FLANGE ADAPTOR	2



11 Woodhouse, machine
working, 3rd floor
GROVE, 1000
1000, 1000, 1000
1000, 1000, 1000, 1000

Rev	Date	Description	Rev	By
1				

Land/Developer

ASHTON BULK WATER SUPPLY
PUMPSTATION UPGRADE

Project

PUMPSTATION PROPOSED UPGRADES

Rev Description

CHAMBERS & DETAILS

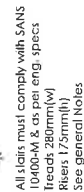
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1:25	2302582	1	A

ORIGINAL SIZE A1

2302582

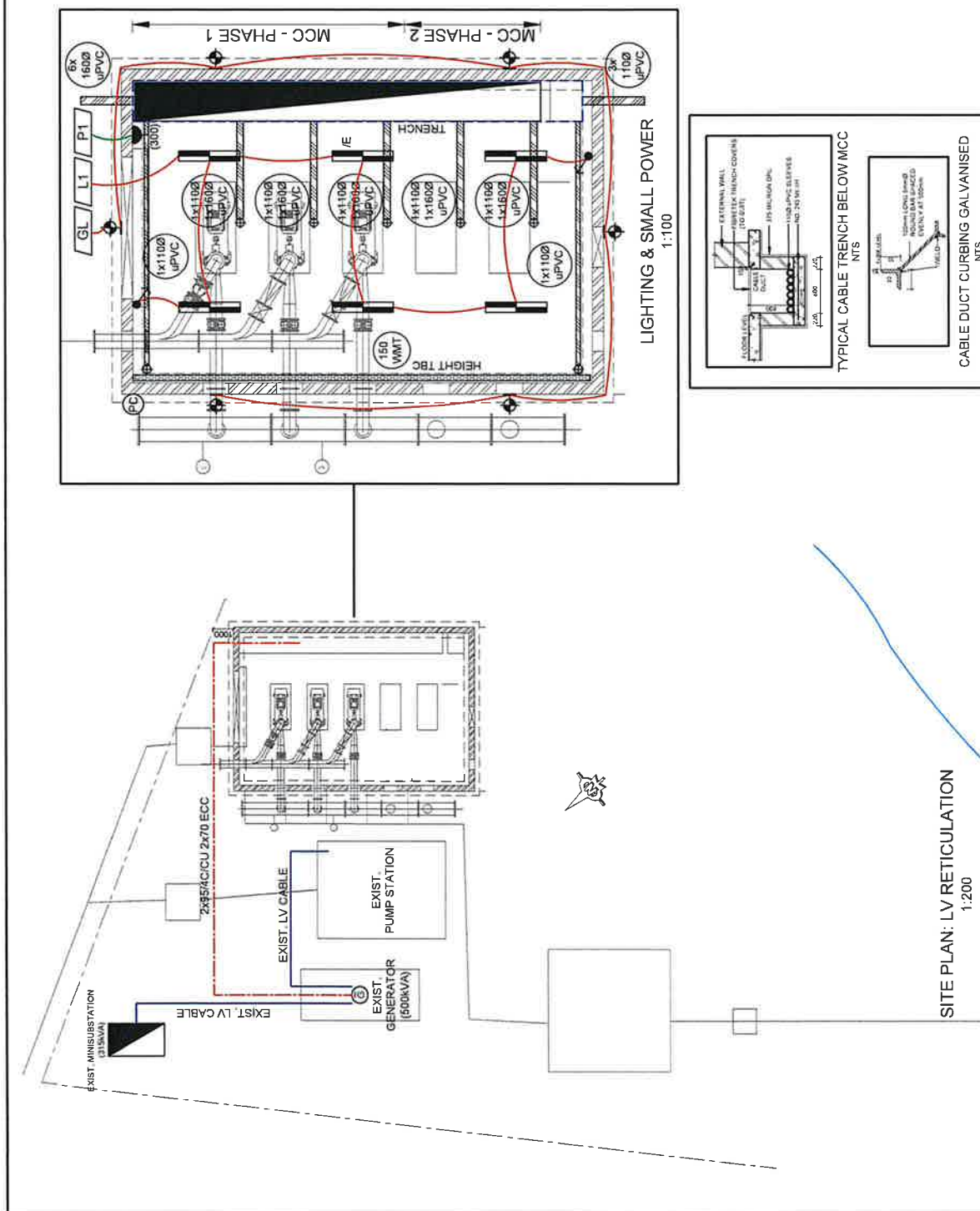
2302582/C104

COMPONENT IS NOTED IN DESIGN CONSULTING PRACTICE PPT112

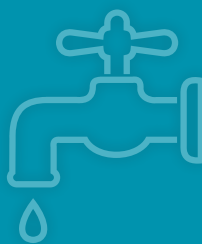


The first 10 minutes are for safety. We review the safety rules and then watch the video. After that, we do a group activity. The students are divided into groups of four. Each group is given a set of cards with different words on them. They have to use the words in a sentence. The teacher will check the sentences.

1	What is the first rule?
2	What is the second rule?
3	What is the third rule?
4	What is the fourth rule?
5	What is the fifth rule?
6	What is the sixth rule?
7	What is the seventh rule?
8	What is the eighth rule?
9	What is the ninth rule?
10	What is the tenth rule?

[illegible]

ANNEXURE B: WATER STORAGE - PRESTANK



PRESTANK tank capacities ranges
from 1 500 litres to 4,2 million litres
designed to SANS 10329:2020 guidelines
and SANS Structural Codes.

PRESTANK Hot Dipped Galvanising units
are easily transported and assembled
on even the most remote sites.

PRESTANK

sustainable &
long term

**WATER
STORAGE
SOLUTIONS**



Pressed Steel Sectional Water Tanks

Structa Technology's **Prestanks** are **hygienically safe**, **cost effective** and a **reliable** way to store water for commercial sectors, private sectors and even for personalized storage. Choose from temporary or permanent erection at mines, powerstations, building sites, hospitals, water affairs, municipalities, rural communities and agriculture. There is a wealth of water storage applications, for which Prestanks are an answer.

Prestanks pride themselves on supplying fully customizable, high quality water storage solutions to **SANS** specifications and meet South African **Hot Dipped Galvanizing** requirements.

sustainable &
long term

WATER STORAGE SOLUTIONS



THERE ARE MANY **BENEFITS** TO CHOOSING **PRESTANKS**:

It facilitates construction of an infinite range of sizes and configurations to meet the specifications and needs of the client: **Handrails**, **walkways** and **lightning protection** are just a few examples of the features available to our clients.

The profile panel sections provide **excellent strength** properties and are structurally sound for storing water. The stand is designed strictly in accordance with **SANS 10160 for wind** and **SANS 10162 for Structural Steel work**.

Tanks mounted on steel towers above ground level have an **aesthetically pleasing** appearance.

Another major advantage of the sectional tank design, is that it facilitates **easier handling** and **transportation** over long distances to **remote areas**, regardless of the final dimensions of the assembled unit.

Assembly on site is **quickly achieved** without the need for sophisticated tooling methods.

Minimum maintenance is required because the galvanized steel panels **resist weathering** from the elements, while maintaining the integrity of the water within from contamination of most forms.

Access to the water tank can be restricted by means of a lockable, **ventilated access cover**, providing **safety** and peace of mind to our clients.

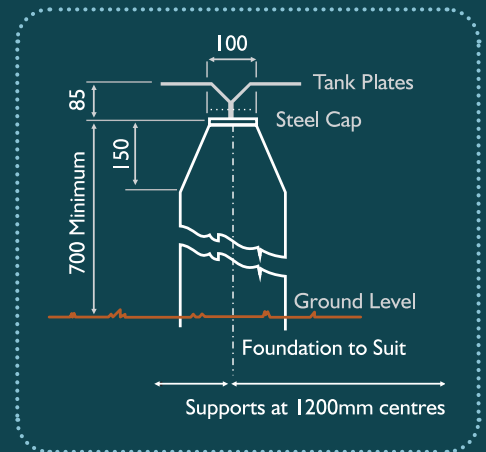
Our tank is designed to **SANS 10329:2020** guidelines.



In this way, pre-manufactured storage facilities having a capacity even in excess of 15 000 cubic meters, can be provided for a vast variety of applications, regardless of the location of the site. Reservoirs constructed from pressed steel sections are used extensively by the mining industry and municipal authorities. Large storage tanks to this design which are mounted on steel towers can also be seen at many of Eskom's power stations.

Structa's pressed steel sectional tanks are hot dip galvanized for corrosion control in accordance with the requirements of the **SANS 121 (ISO 1461)** galvanizing standard. The thickness of the hot dip galvanizing coat is applied within a range of 80 to 100µm. This is more than five times the thickness of zinc on pre-galvanized corrugated steel cylindrical tanks. The purpose is to ensure extended maintenance free life in situations where water with aggressively corrosive properties is required to be stored. Structa Technology Prestanks are water storage solutions of high standard and quality. For your customized quotation, contact us:

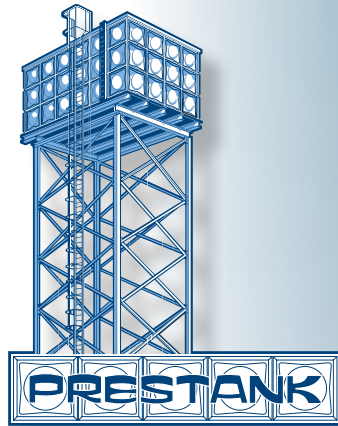
www.structatech.co.za



Recommended Dimensions for Support

PLANNING TABLE:

SIZE IN PLAN (Modules)	ONE module deep			TWO module deep			THREE module deep			FOUR module deep		
	No. of plates	Approx. capac. Litres	Approx. Mass Ton	No. of plates	Approx. capac. Litres	Approx. Mass Ton	No. of plates	Approx. capac. Litres	Approx. Mass Ton	No. of plates	Approx. capac. Litres	Approx. Mass Ton
1 x 1	5	1521	0.40	9	3240	0.69	13	4968	1.08	17	6696	1.51
2 x 1	8	3024	0.66	14	6840	1.12	20	9936	1.50	26	13392	2.14
2 x 2	12	6048	1.06	20	12960	1.71	28	19872	2.66	36	26754	3.50
3 x 2	16	9072	1.43	26	19440	2.95	36	29808	3.50	46	40176	4.57
3 x 3	21	13608	1.90	33	29160	3.28	45	44712	4.46	57	60264	5.74
4 x 3	26	18144	2.39	40	38880	3.65	54	59616	5.50	68	80352	7.00
4 x 4	30	24192	2.99	48	51840	4.56	64	79488	6.59	80	107136	8.30
5 x 4	38	30240	3.60	56	64800	5.21	74	99360	7.79	92	133920	9.72
5 x 5	45	37800	4.30	65	81000	6.07	85	124200	8.08	105	167400	10.22
6 x 5	52	45360	5.01	74	97200	6.98	96	149040	10.38	118	200880	12.73
6 x 6	60	54432	5.83	84	116640	8.00	108	178848	11.84	132	241056	14.41
7 x 6	68	63504	6.50	94	136080	9.36	120	208656	13.27	146	281232	16.05
7 x 7	77	74088	7.49	105	158760	10.14	133	243432	14.84	161	328104	17.84
8 x 7	86	84672	8.12	116	181440	11.04	146	278208	16.40	184	374976	19.61
8 x 8	96	96768	9.41	128	207360	12.49	160	317952	18.09	192	428544	21.15
9 x 8	106	108864	10.06	140	233280	13.16	174	357696	19.79	208	482112	23.43
9 x 9	117	122472	11.07	153	262440	15.39	189	402408	21.61	225	542376	25.29
10 x 9	128	136080	12.18	166	291600	16.39	204	447120	23.42	242	602640	27.49
10 x 10	140	151200	13.38	180	324000	17.50	220	496800	25.37	260	669600	29.65



Pressed Steel Sectional Water Tanks

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STRUCTA TECHNOLOGY (PTY) LTD • PO Box 2538, **Vereeniging**, 1930
Tel: +27(0)16 362 9100 • Fax: +27(0)16 362 3608

Sales and Marketing: Godfrey Mpotu • contracts@structatech.co.za • 079 035 6997

Estimator: Judy van der Walt • watertanks1@structatech.co.za

Director: Rodney Cory • rodney@structatech.co.za

www.prestank.co.za

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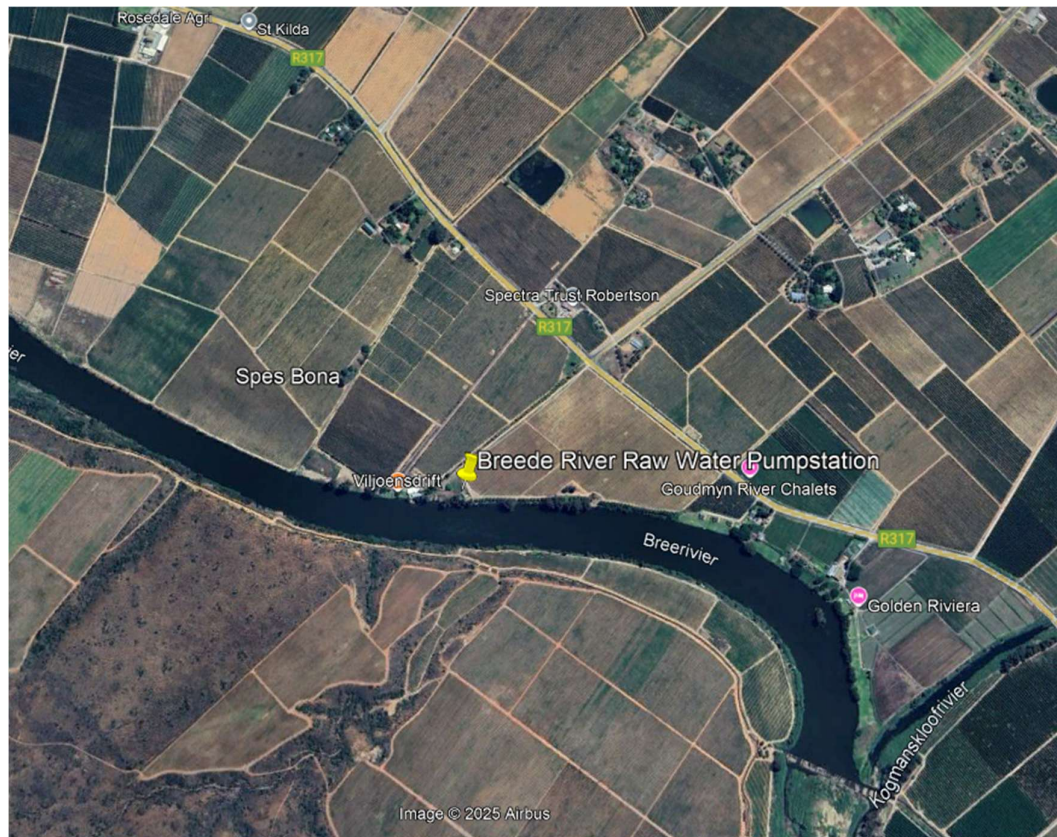
Part C4: Site Information

C4.1 DESCRIPTION OF THE WORKS

The project entails the construction of a new fenced-off pumpstation reinforced concrete structures near Ashton, Bonnievale and Robertson adjacent to the Breede River. The pumpstation has been raised above the regular flood level, the pumps to transport small vegetative solids in the raw water, the supply pumps to be mounted on floating system supplying a raw water reservoir.

C4.2 LOCATION OF THE WORKS AND ACCESS

The Breede River Raw Water Supply Pumpstation is on the banks of the Breede River approximately 13.4km from Robertson on the R317, between Robertson and Bonnievale, at the intersection with DR1358 to Ashton, as shown on the image below.



C4.3 NATURE OF GROUND, SUBSOIL AND GROUNDWATER CONDITIONS

No comprehensive geotechnical investigation was conducted to assess the ground conditions at the proposed pumpstation site, but sandy material with some river boulders is expected.

In general, excavated material will not be suitable for use as bedding for pipelines and material will have to be imported from commercial sources. Allowance will be made in the bill of quantities where bedding or fill material needs to be imported for construction purposes.

Contractors must satisfy themselves regarding the quality and type of material on site, since the Contractor is responsible for the supply of materials in compliance with the minimum requirements for the specific materials.