CONTRACT NO: VCW402/MCV/NFS/25

VOLUME 1 – TECHNICAL PROPOSAL

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

21 OCTOBER 2025

TENDER SUBMITTED BY:

Registered Name of Company: .....

Address: .....

Telephone Number: ....

Fax Number: ....

Email: .....

Issued by:

Vaal Central Water
P. O. Box 30121
Pellissier
9322

ISSUE DATE: **21 October 2025**

BRIEFING SESSION: 30 October 2025 (Compulsory)

CLOSING DATE: 21 November 2025

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25: INSTALLATIONOF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

TENDERING PROCEDURES

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VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

TENDERING PROCEDURES

SECTION T1.1: TENDER NOTICE AND INVITATION TO TENDER

Tender Notice and Invitation to Tender

CONTRACT NUMBER: VCW402/MCV/NFS/25

PROJECT DESCRIPTION: INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

Section T1.1: Tender Notice and Invitation to Tender

Vaal Central Board (Former Bloem Water) derives its primary mandate from the Water Services Act, Act 108 of 1997 and is, in terms of the Public Finance Management Act (PFMA), Act 1 of 1999, Schedule 3B, a National Government business entity, which reports to the Executive Authority, represented by the Minister of Water and Sanitation through the Department of Water and Sanitation (DWS).

Vaal Central is a Water Board with the mandate to provide water services to the Southern and Central areas of the Free State Province and the Northern Cape respectively to include the entire jurisdictional area that was previously serviced by Sedibeng Water as gazetted on 26 July 2022 by the minister of Water of Water and Sanitation.

Vaal Central Water accordingly invites interested Service Providers to tender for the following construction contract.

Contract No: VCW402/MCV/NFS/25: INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

Scope of Works

The primary objective of the project is installation of smart water billing meters and smart chambers which are not fully functional.

Specifically, the installation of PN 16 Smart Meters & Smart Chambers will include but not limited to:

- Replacement of 40 x Billing Smart Magflo Meter Isomag WaMSS Scada Web Based with built-in transmission, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device and Valves in Matjhabeng LM
- Replacement of 6 x Billing Meters, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device in Nala LM
- Modification 9 x Chambers to Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device
- Replacement of 9 x Flow Meter and LDS Flow Meters at Balkfontein and Virginia
- Replacement of 34 x Billing Smart Magflo Meter Isomag WaMSS Scada Web Based with built-in transmission, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device and Valves at the Mines
- Supply & Install WaMMS Scada System Web Based complete
- Training and licensing of software to Vaal Central Water Board

Where bid documents can be obtained:

National Treasury Website – eTender Publication: www.etenders.gov.za

Vaal Central Water Website: www.vaalcentralwater.co.za

The Construction Industry Development Board (CIDB) website: www.cidb.org.za

A *compulsory briefing session* with representatives of the employer will take place on Monday, 30 October 2025 at Balkfontein Water Treatment Plant at 11:00, Protea Street, Balkfontein, Bothaville, 9660

- The WTW coordinates are -27° 24' 0" **South** 26°30'15" **East**

The service provider should in all respects comply with the conditions as set out below and as specified in the tender document. It is estimated that tenderers should have a CIDB Contractor Grading designation of **7 EP OR 7 ME PE/HIGHER** in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations, 2004. Potentially emerging (PE) enterprises who satisfy the criteria stated in the bid document may submit bid offers.

Only tenderers that satisfy the eligibility criteria stated in the tender document will be eligible to submit tenders.

Vaal Central Water promotes Broad Black Economic Empowerment. The name of the firm submitting the tender shall be clearly shown on all correspondence. An appointment will be made in terms of the approved Supply Chain Management Policy of the Board of Vaal Central Water.

Completed proposals must be addressed as below and deposited **before 12:00 on Friday, 21 November 2025** at the Tender Box situated at the Vaal Central Water Reception Area for Attention:

Supply Chain Management

Vaal Central Water,

2 Mzuzu Street,

Pellissier,

Bloemfontein,

9322

Each bidder must submit an envelope clearly marked Contract No. **VCW402/MCV/NFS/25: INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION** with the bidder's name and address. The name of the firm submitting the tender shall be clearly shown on all correspondence. An appointment will be made in terms of the approved Supply Chain Management Policy of the Board of Vaal Central Water.

Tenders may only be submitted on the tender documentation that has been issued. One-envelope system will be followed.

Each proposal must be submitted in 1 separate envelope clearly marked:

1. VCW402/MCV/NFS/25: – Request for Proposal (RFP): INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION – Technical Proposal and – Financial Proposal.

Proposals which are incomplete, filled incorrectly, or telegraphic, telephonic, telex, facsimile, e-mail and late tenders will not be accepted. Should you do not receive any feedback from Vaal Central Water after 120 days of submission, consider your tender unsuccessful. Vaal Central Water reserves the right NOT to appoint any Service Provider or to withdraw this request for bids.

Service Providers who meet the specified quality criteria will be further evaluated in line with the Preferential Procurement Policy Framework Act (PPPFA) principle of 90/10 or 80/20. Vaal Central Water reserves the right not to award the tender to the highest scoring bidder.

Technical Queries can be directed to:

Mr. K Pule

Vaal Central Water

Tel: +27(0) 51 403 533

Email: kgetsip@vcwater.co.za

Tender Administrative Queries can be directed to:

Supply Chain Management

Tel: 051 - 403 0800

Fax: 051 – 422 5333

Email: bids@vcwater.co.za

NB: *Service Providers to all departments, constitutional institutions and public entities listed in schedule 2 and 3 of the PFMA are required to self-register on the Central Supplier Database.*

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

TENDERING PROCEDURES

SECTION T1.2: TENDER DATA

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

T1.2 TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the Construction Industry Development Board's Board Notice 423 of 2019 (contained in Government Gazette No. 42622 of 08 August 2019), bound into Section T1.3.

The Standard Conditions of Tender makes several references to the Tender Data. The Tender Data also contains project specific amendments to the Standard Conditions of Tender applicable to this document. 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.

Clause	Addition or Variation to Standard Conditions of Tender
1.1	The Employer is Vaal Central Water.
1.2	The Tender documents issued by the Employer comprise two volumes. Each volume consists of the following: **VOLUME 1: TECHNICAL PROPOSAL** Part T1 Tendering Procedures Section T1.1 Tender Notice and Invitation to Tender Section T1.2 Tender Data Section T1.3 Standard Conditions of Tender Part T2 Returnable Documents and Schedules. Section T2.1 Returnable Schedules for Bid Evaluation Purposes Section T2.2 Other Documents Required for Bid Evaluation Purposes **VOLUME 2: FINANCIAL PROPOSAL** Part C1 Agreements and contract data Section C1.1 Forms of offer and acceptance Section C1.2 Contract Data Part C2 Pricing Data Section C2.1 Pricing Instructions Section C2.2 Schedule of Quantities Section C2.3 Summary of Schedules Section C2.4 Banking Details Part C3 Scope of work Section C3.1 Description of the Works Section C3.2 Standard Specifications Section C3.3 Project Specifications

Clause	Addition or Variation to Standard Conditions of Tender
	Section C3.4 Particular Specifications Part C4 Site Information Annexure A: Tender Drawings Annexure B: Environmental Management Plan
1.3.2	Replace this sub-clause with the following: These Conditions of Tender, the Tender Data, List of Returnable Documents and Returnable Schedules which are required for Tender evaluation purposes, shall form part of the Contract arising from the invitation to Tender.
1.4	The Employer's Agent is (also referred to as the Engineer): **Henry Fagen Consulting Engineers & Projects** Regus Business Centre, Ground Floor, Unipark Building Vodacom Lane, Nobel Street, Bloemfontein **Name**: Mr. P Van Der Merwe Tel: +27 10 500 1486 Email: pietervdm@henryfagan.com
1.5 1.5.1	**The Employer's right to accept or reject any tender offer.** Replace the contents of the clause with the following: The Employer may accept or reject any Tender or portion thereof, variation, deviation, tender offer, or alternative tender offer, and may cancel the tender process and reject all tender offers at any time before the formation of a contract. The employer shall not accept or incur any liability to a tenderer for such cancellation and rejection, but shall give reasons for such action
1.6.1	Replace the contents of the clause with the following: The Employer reserves the right, within unambiguous and justifiable reasoning, to not necessarily conclude a contract with the tenderer who in terms of F.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. The Employer reserves the right to accept, where applicable, a part or portion of any Tender or where possible accepts Tenders or proposals from multiple Tenders.
2.1	Only those tenderers who satisfy the following criteria are eligible to submit tenders. Bidders who do not adhere to those criteria listed below will be disqualified immediately.

Clause	Addition or Variation to Standard Conditions of Tender

A. Bidders who do not adhere to those criteria listed below a PRE-QUALIFIER, will be disqualified immediately.

	Responsiveness Criteria	Prequalifying Criteria	Applicable to this Tender (Y/N)
1	Fully completed and signed Standard Bidding Documents · SBD Form 1 · SBD Form 3.1 · SBD Form 4 · SBD Form 6.1	Pre-Qualifier	Y
2	Attendance of the Compulsory Clarification Session attended by the Bidder	Pre-Qualifier	Y
3	CIDB registration and Grading The following tenderers who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated: 1- Contractors who have 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) of 25 (7A) of the Construction Industry Development Regulations, for a level **7 EP PE OR ME PE/ HIGHER** are eligible to submit Tenders for this contract. 2- Contractors registered as potentially emerging enterprises with the CIDB who are registered in one contractor grading designation lower than that required in terms	Pre-Qualifier	Y

Clause	Addition or Variation to Standard Conditions of Tender				
			of (a) above and who satisfy the following criteria: • the Employer is satisfied that such a contractor has the potential to develop and qualify to be registered in that higher grade as determined in accordance with the provisions of the CIDB Specification for Social and Economic Deliverables in Construction Works Contracts; and • the Employer agrees to provide the financial, management or other support that is considered appropriate to enable the contractor to successfully execute that contract. 3- Joint ventures are eligible to submit Tenders provided that: 1. every member of the joint venture is registered with the CIDB within 10 days from the closing date of tenders; 2. the lead partner has a contractor grading designation in the **7 EP PE OR 7 ME PE/ HIGHER** class of construction work; and 3. 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 **7 EP PE OR 7 ME**		

Clause	Addition or Variation to Standard Conditions of Tender			
		PE/ HIGHER class of construction work The Employer may, in its discretion, subject to the provision of Section 4(1)(d) of the State Tender Board Act (Act 86 of 1968), condone any failure to comply with the foregoing condition.		
	4	The Bidder should be able to submit the following: • Certified copy of certificate of Incorporation if Bidder is a company or; • Certified copy of founding statement if Bidder is a closed corporation or; • Certified copy of Partnership agreement if Bidder is a partnership or; • Certified copy of Identity document if Bidder is a one-man concern.	Pre-Qualifier	Y

B. Bidders who do not adhere to the indicated response time for clarifications requested by the Employer will be deemed to be non-responsive and their submissions will not be evaluated further.

	Responsiveness Criteria	Clarification Time	Applicable to this Tender (Y/N)
1	The Respondent submits a valid Tax Compliance Status PIN letter issued by the South African Revenue Services or has made arrangements to meet outstanding tax obligations. Respondents shall be registered and in good standing with the South African Revenue Services (SARS) and should be able to submit a valid tax compliance pin issued by SARS. Each party to a Consortium/Joint Venture should be able to submit a separate valid Tax	7 days	Y

Clause	Addition or Variation to Standard Conditions of Tender			
		Compliance Status PIN letter and attach it to the schedule.		
	2	Respondents that provide a copy of latest Unemployment Insurance Fund (UIF) return (if not stated on the valid tax compliance pin)	7 days	Y
	3	The Respondent has not abused the Employer's Supply Chain Management System or failed to perform on any previous contract and has been given written notice to this effect.	7 days	Y
	4	The Respondent or any of its Directors/Shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector.	7 days	Y
	5	The Employer will only enter into a formal contract with a respondent who is registered on the National Treasury Central Supplier Database (CSD). The submission of a full CSD report (not summary) is compulsory for any Respondent to be eligible to submit.	7 days	Y
	6	The Respondent has completed the Declaration of Interest and there are no conflicts of interest which may impact on the Respondent's ability to perform the contract in the best interests of the Employer or potentially compromise the submission process and persons in the employ of the state are permitted to submit bids or participate in the contract.	7 days	Y
	7	The Respondent submits a valid B-BBEE Compliance Certificate issued by an Accredited Service Provider or Certified Sworn Affidavit.	7 days	Y
	8	The Respondent submits and original (or certified copy) of Municipal rates clearance certificate or a certified copy of the lease agreement - Not older than 3 months (Vaal Central Water reserves the right to conduct physical verification of premises).	7 days	Y
	9	Only those Respondents that can provide Financial references, audited financial statements as required and with a bank rating of not less than a "C" can be considered for evaluation.	7 days	Y

Clause	Addition or Variation to Standard Conditions of Tender
	<table><tr><td>10</td><td>Annexure 1: Acceptance of Bid conditions – to be duly completed and</td><td>7 days</td><td>Y</td></tr><tr><td>11</td><td>Annexure 2: Supply Chain Management Questionnaire – to be duly</td><td>7 days</td><td>Y</td></tr></table> The tenderer's primary business is to provide supplies or services as per the Tender invitation Accept that all returnable documents and schedules which are required to be certified are done so by a registered Commissioner of Oaths of the Republic of South Africa.
2.2	Bidders must utilise the National Treasury's Central Supplier Database (CSD) for identification of potential subcontractors from the pool of EMEs or QSEs to advance designated groups. The responsibility to subcontract with competent and capable sub-contractors' rests with the main contractor/ supplier. As far as possible, the bidder must consider subcontractors from the area/s where the project will be taking place. Where CIDB related works are subcontracted, each Subcontractor must also be registered with the appropriate CIDB grading in accordance with the value of the work to be undertaken by that Subcontractor.
2.2.1	Add the following to sub-clause 2.2.1: Accept that the Employer will not compensate the tenderer for any costs incurred in attending interviews in the office of the Employer or the Employer's Agent (if required).
F2.6	Add the following to the clause: Failure to acknowledge receipt of any addenda will result in disqualification. It is the responsibility of the tenderer to provide accurate and clear information on the attendance register or Purchase of Tender document register. The Employer's agent will not follow-up on incorrect or unclear information provided.

Clause	Addition or Variation to Standard Conditions of Tender
2.7	A compulsory clarification meeting and site visit will be held as follows: **Location**: Balkfontein Water Treatment Plant, Protea Street, Balkfontein, Bothaville, 9660 **Coordinates**: Latitude: 27° 24' 0" South Longitude: 26° 30' 15" East **Date**: Thursday, 30 October 2025 **Time**: 11:00 For a joint venture, one of the partners must attend the compulsory clarification meeting. Confirmation of attendance will be recorded, on site, in the Site Inspection Certificate included in Section T2.2 of the Document. Tender documents will be made available at the site visit or clarification meeting. Detail relating to the collection of tender documents is indicated in the Tender Notice and Invitation to Tender (Section T1.1 of the document). Failure to fill the attendance register and/or the "Site Inspection Certificate" will result in a disqualification. Bidders should be represented at the site visit/clarification meeting by a person who is suitably qualified and experienced to comprehend the implications of the work involved. Addenda will be issued only to those tendering entities appearing on the attendance list.
2.8	Replace the contents of the clause with the following: Request clarification of the tender documents, if necessary, by notifying the Employer's Agent, as indicated in the Tender Notice and Invitation to Tender, at least seven (7) working days before the closing time stated in the Tender Data.
2.9	Add the following to the clause: The Contractor shall be responsible to affect all insurance as required for the purposes of executing the Contract.
2.10.5	Add the following sub-clause 2.10.5: A digital copy of the Bill of Quantities can be obtained from Vaal Central Water Supply Chain Department (bids@vcwater.co.za) at the office of the Employer upon sufficient notice.
2.11	Replace the last sentence of the clause with the following:

Clause	Addition or Variation to Standard Conditions of Tender
	To correct errors made, draw a line through the incorrect entry and write the correct entry above in black ink and place the full signatures of the authorised signatories next to the correct entry. Corrections in terms of price may not be made by means of a correction fluid such as Tippex or a similar product. If correction fluid has been used on any specific item price, such item will not be considered. No correction fluid may be used in a Bill of Quantities where prices are calculated to arrive at a total amount. If correction fluid has been used the tender as a whole will not be considered. Tampering with or taking the documents apart is strictly prohibited."
2.12.1	Add the following to the clause: All alternative tender offers shall be referred to in Section T2.2.1 – Alterations to Tender.
2.12.2	Add the following to the clause: Should the Tenderer wish to offer alternative designs and/or construction materials, he shall include with this Tender, full details thereof, including a complete bill of quantities, formal design calculations, and full details of all alternative components proposed to be included in the Works. Refer also to the Contract Data in this regard. Failure to properly comply with this clause, thereby preventing the Employer and/or the Employer's Agent to properly assess the full implications of the alternative tender, is likely to disqualify the alternative offered from further consideration. No submission by the Contractor after award for additional payment or time for completion of Works relating to the alternative offer will be considered, the tender rates submitted shall be considered to reflect the full and final cost implications of the alternative offer.
2.13.2	Replace the contents of the clause with the following: Return the complete set of documents as listed in the Tender Data with all the required information supplied and completed in all respects. All volumes are to be left intact in its original format and no pages shall be removed or re-arranged.
2.13.3	Only one (1) original tender offer is required. It is recommended that all pages be numbered.
2.13.4	Add the following to the clause:

Clause	Addition or Variation to Standard Conditions of Tender
	Only authorised signatories may sign the original and all copies of the tender offer where required in terms of 2.13.3. **Accept that failure to submit proof of authorisation to sign the tender shall result in a Tender Offer being regarded as non-responsive.** In the case of a ONE-PERSON CONCERN submitting a tender, this shall be clearly stated. In case of a COMPANY submitting a tender, include a certified copy of the Certificate of Incorporation of such company, together with a resolution by its board of directors authorising a director or other official of the company to sign the documents on behalf of the company. In the case of a CLOSED CORPORATION submitting a tender, include a certified copy of the Founding Statement of such corporation, together with a resolution by all its members authorising a member or other official of the corporation to sign the documents on each member's behalf. In the case of a PARTNERSHIP submitting a tender, all the partners shall sign the documents, unless one partner or a group of partners has been authorised to sign on behalf of each partner, in which case proof of such authorisation/resolution by partners shall be included in the Tender. In the case of a JOINT VENTURE submitting a tender, include a certified copy of the Certificate of Incorporation or Founding Statement or Partnership (as applicable) of each Joint Venture member, a draft Joint Venture Agreement and a resolution of each Joint Venture member authorising an official to sign documents on behalf of the Joint Venture member (in accordance with the requirements above) and a resolution by all Joint Venture members authorising a member of the Joint Venture to sign the documents on behalf of the Joint Venture.
2.13.5	Refer to the Tender Notice and Invitation to Tender (Section T1.1) for the Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are Tender box location : Tender Box, Vaal Central Water Physical address : Ground Floor Main Entrance 2 Mzuzu Street, Pellissier Bloemfontein 9300

Clause	Addition or Variation to Standard Conditions of Tender
	Identification details : **Tender Number : VCW402/MCV/NFS/25** **Title of Tender : INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION** Sealed tenders with the Tenderer's name and address and the endorsement "Tender No: VCW402/MCV/NFS/25 on the envelope, must be placed in the appropriate official tender box at the abovementioned address.
2.13.6	A two-envelope procedure will not be followed.
2.13.10	Add the following sub- clause 2.13.10: Accept that all conditions, which are printed or written upon any stationary used by the Tenderer for the purpose of or in connection with the submission of a tender offer for this Contract, which are in conflict with the conditions laid down in this document shall be waived, renounced and abandoned.
2.14	Add the following to the clause: The Tenderer is required to enter information in the following sections of the document: Section T2.1 : Returnable Schedules Required for Bid Evaluation Purposes Section T2.2 : Other Documents Required for Bid Evaluation Purposes Section C1.2 : Contract Data (Part 2) Section C1.3 : Form of Performance Security Section C1.4 : Health and Safety Agreement Form Section C2.2 : Bill of Quantities Section C2.3 : Summary of Schedules Section C2.4 : Banking Details The above sections shall be signed by the Tenderer (and witnesses where required). Individual pages should only be initialled by the successful Tenderer and by the witnesses after acceptance by the Employer of the Tender Offer. The Tenderer shall complete and sign the Form of Offer prior to the submission of a Tender Offer. The Schedule of Deviations (if applicable) shall be signed by the successful Tenderer after acceptance by the Employer of the Tender Offer.

Clause	Addition or Variation to Standard Conditions of Tender
	Accept that failure on the part of the Tenderer to submit any one of the Returnable Documents listed in clauses 2.13 and 2.23 within the period stipulated, shall be just cause for the Employer to consider the Tender offer as being regarded as non-responsive. Accept that the Employer shall in the evaluation of tender offers take due account of the Tenderer's past performance in the execution of similar engineering works of comparable magnitude, and the degree to which he possesses the necessary technical, financial and other resources to enable him to complete the Works successfully within the contract period. Satisfy the Employer and the Employer's Agent as to his ability to perform and complete the Works timeously, safely and with satisfactory quality, and furnish details in section T2.2.2 of contracts of a similar nature and magnitude which they have successfully executed in the past. Accept that the Employer is restricted in accordance with clause 5 (1) of the Construction Regulations, 2014, to only appoint a contractor whom he is satisfied has the necessary competencies and resources to carry out the work safely. Accept that submitting inferior and inadequate information relating to health and safety (as required in clause 2.23) shall be regarded as justifiable and compelling reasons not to accept the Tender Offer of the Tenderer scoring the highest number of tender evaluation points.
2.15.1	Add the following to the clause: The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender. Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.
2.16.1	The tender offer validity period is **120 days**.
2.16.1	Add the following to the clause: If the tender validity expires on a Saturday, Sunday or public holiday, the tender shall remain valid and open for acceptance until the closure of business on the following working day.
2.16.5	Add the following new clause: Accept that should the Tenderer unilaterally withdraw his tender during the tender validity period, the Employer shall, without prejudice to any other rights he may have, be entitled to accept any less favourable tender for the Works from those received, or to call for fresh tenders, or to otherwise arrange for execution of the Works, and the Tenderer shall pay on demand any additional expense incurred by the Employer on account of the adoption of the said courses, as well as either the difference in cost

Clause	Addition or Variation to Standard Conditions of Tender
	between the tender withdrawn (as corrected in terms of clause 3.9 of the Conditions of Tender) and any less favourable tender accepted by the Employer, or the difference between the tender withdrawn (as corrected) and the cost of execution of the Works by the Employer as well as any other amounts the Employer may have to pay to have the Works completed.
F2.17	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 resulting from the product of the unit rate and the quantity by the adjustment of certain line-item totals. No change in the unit rate or prices or substance of the tender offer is sought, offered, or permitted. The total of the prices shall be adjusted to reflect the arithmetically correct summation of corrected line-item totals and shall be binding upon the tenderer. Note: Sub-clause F 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.
2.18.1	Add the following to the clause: Accept that if requested, the Tenderer shall within 7 days of the date upon which he is requested to do so, submit a full report from his banker as to his financial standing. The Employer may, in its discretion, and subject to the provisions of Section 4(1)(d) of the State Tender Board Act 86 of 1968, condone any failure to comply with the foregoing condition. Accept that the Employer or his agent, reserves the right to approach the Tenderer's banker or guarantor(s) as indicated in the tender document, or the bankers of each of the individual members of any joint venture that is constituted for purposes of this Contract, with a view to ascertaining whether the required guarantee will be furnished, and for purposes of ascertaining the financial strength of the Tenderer or of the individual member of such venture.
2.22	Return all retained tender documents prior to the closing time for the submission of Bid Offers.

Clause	Addition or Variation to Standard Conditions of Tender
2.23	Refer eligibility criteria as specified in clause F2.1.1, information and data to be completed in all respects as per clause F2.14, and the test for responsiveness as specified in clause F3.8.1.
2.24 (New clause)	Add new clause: Accept that no Tenderer shall make any attempt either directly or indirectly to canvass any of the Employers officials or the Employer's Agent in respect of his tender, after the opening of the tenders but prior to the Employer arriving at a decision thereon. No Tenderer shall make any attempt to obtain particulars of any relevant information, other than that disclosed at the opening of tenders.
2.25 (New clause)	Add new clause: Accept that no Bidder shall make any attempt either directly or indirectly to canvass any of the Employers officials or the Employer's Agent in respect of his bid, after the opening of the bids but prior to the Employer arriving at a decision thereon. No Bidder shall make any attempt to obtain details of any relevant information, other than that disclosed at the opening of bids.
2.25 (New clause)	Add new clause: Accept that the Employer is prohibited to award a tender to a person: - a) who is in the service of the State; or b) if that person is not a natural person, of which any director, manager, principal shareholder or stakeholder is a person in the service of the State; or c) a person who is an advisor or consultant contracted with the municipality or municipal entity. "**In the service of the State**" means to be – a) a member of – • any Municipal Council. • any provincial legislature; or 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. e) provincial public entity or constitution within the meaning of the Public Finance Management Act, 1999 (Act No. 1 of 1999). f) a member of the accounting authority of any national or provincial public entity; or

Clause	Addition or Variation to Standard Conditions of Tender
	g) an employee of Parliament or a provincial legislature.
2.26 (New clause)	Add new clause: Accept that the notes to the Employer's annual financial statements must disclose particulars of any award of more than R 2 000 to a person who is a spouse, child or parent of a person in the service of the state (defined in clause 2.25), or has been in the service of the state in the previous twelve months, including – a) the name of that person. b) the capacity in which that person is in the service of the state; and c) the amount of the award. In order to give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in Section T2.2 must be completed.
3.1	Replace the contents of the clause with the following: 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 procurement documents within two (2) working days of the same date.
3.4	Bids will be opened immediately after the closing time for tenders, at the same venue.
3.8.1	Test for responsiveness A responsive tender will be evaluated in terms of the following: Accept that failure to comply with any one of these requirements, shall result in a tender offer being regarded as non-responsive • the eligibility requirements of Clause F2.1.1, • attendance at the clarification meeting as per Clause F2.7, • all required documents signed by the authorised signatories as per Clause F2.13.4, • acknowledge addenda as per Clause F3.2 • Information and Data required to be Completed in all respects as per Clause F2.14
3.9	Replace the contents of the clause with the following: Check responsive tender offers for arithmetical errors, correcting them in the following manner: a) Where there is a discrepancy between the amounts in figures and in words, the amount in words shall govern.

Clause	Addition or Variation to Standard Conditions of Tender
	b) If a bill of quantities (or schedule of quantities or schedule of rates) applies and there is an error in the line-item total resulting from the product of the unit rate and the quantity, the unit rate shall govern, and the line-item total shall be corrected. c) 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 corrected total of the prices shall govern. d) Where there is a discrepancy between the amount indicated in the Tenderer's tender offer and the corrected amount obtained after completing the above steps, the Tenderer's tender offer amount shall govern. Notify a Bidder upon written request received after the closing date of tenders of all arithmetical errors made by that particular Bidder. Consider the rejection of a bid offer if the Bidder does not accept the correction of the arithmetical errors in the manner described above.
3.11	The Tender will be evaluated based on the pre-qualification requirement as described in the Preferential Procurement Policy Framework 2022, that requires Tenders to sub-contract 30% of the contract value excluding materials, provisional sums, allowance for CPA, contingencies and VAT for Tenders above R 30 million to locally registered enterprises. Following the evaluation of the pre-qualification requirement above, Functionality, Price and Preference will be used to evaluate all responsive Tender Offers, as follows: a) Score functionality, rejecting all tender offers that fail to achieve the minimum number of points for functionality. Evaluate tenders that have achieved the minimum qualification score for functionality in terms of the following items b, c, and d b) Score tender evaluation points for price c) Score points for B-BBEE contribution d) Add the points scored for price and B-BBEE to obtain the total number of points scored. Bidder must subcontract a minimum of 30% of the value of the contract to an EME or QSE/s that is a minimum 51% black owned. The following evidence must be submitted:

Clause	Addition or Variation to Standard Conditions of Tender
	• A signed subcontracting agreement stipulating the percentage to be subcontracted. • CSD report/s for subcontractor/s. • CIDB Registration for subcontractor/s where CIDB related works are subcontracted, each subcontractor must also be registered with the appropriate CIDB grading in accordance with the value of work to be undertaken by that subcontractor, or are capable of being so prior to the evaluation of submission, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the CIDB grading of this bid , in accordance with CIDB prescripts. Where the CIDB requirement for sub-contracted work is not met, this test for responsiveness has not been met. • Proof of B-BBEE status for subcontractor/s. **Objective Criteria** **Price Analysis** Vaal Central Water uses a Financial Tolerance Range also referred to as standard deviation to in order to assess how reasonable the market response prices are (the consultant estimate). These ranges will assist with eliminating bid prices that are deemed to be excessively high or low to complete the works. The higher limit ensures that Vaal Central Water does not pay more that it believes the value of service or goods is worth, and the lower limit ensures that Vaal Central Water is not exposed to risk of work not being completed or prices increasing subsequent to the award because the award price was too low to complete said scope. Vaal Central Water reserves the right to not appoint the lowest bidder, this is in the event the bidder submits a bidder lower than the Consulting Engineer estimate together with the average of submitted contractors at date and time of closing. The financial tolerance range for this bid is -20% to +20%.

Clause	Addition or Variation to Standard Conditions of Tender
	Where the prospective contractor is above the Consulting Engineer estimate together with the average of the submitted contractors Vaal Central Water reserves the right to negotiate the recommended contractor to the maximum of the estimate plus the +20%. Vaal Central Water will not negotiate a contractor below the estimate (increase form of offer). **Risk Analysis** Vaal Central Water reserves the right to perform a risk analysis on the tenderer having the highest ranking/number of points to ascertain if any of the following, as relevant, present and unacceptable commercial risk to the employer: a) unduly high or unduly low tendered rates or amounts in the tender offer; b) contract data provided by the employer, or c) the contents of the tender returnables which are to be included in the contract. d) To ensure the recommended bidder poses no material reputational or legal risk to VCW. e) Confirm that the winning bidder's affairs will not have an unfavourable reputational risk on VCW (ongoing court cases, listing in the National Treasury restricted supplier list, negative media reports).
3.11.3	a) No bid must be regarded as an acceptable bid if it fails to achieve the minimum qualifying score for functionality as indicated in the bid invitation and elaborated further in the Bid Data. Functionality will be scored as follows:

Technical Evaluation Criteria

Description of Evaluation Criteria	Points
1. Tenderer's experience in the applicable class of works (Attach Completion Letters/Certificates and include contactable reference names and numbers)	**35**
Tenderer's experience in projects R10 million and above where the scope of works includes the installation of smart water meters or bulk water meters and related works. **a.** (i) 4 or more Projects: -**35 Points** (ii) 2 - 3 Projects: - **25 Points** (iii) 1 Project: - **10 Points** (iv) 0 Project: - **0 Points** **** NB: VAAL CENTRAL WATER will verify purchase orders / references provided hence the bidder is to ensure that all contact details are up to date***	

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

2. Expertise of construction site personnel, related to this project (Attach CV and qualification certificates)	
a) **Contract/Project Manager** with BEng/BTech in Electrical or Mechanical engineering with more than 10 years of experience in water distribution pipelines, installation of smart water flow meters, smart chambers and Valves **– 20 Points** b) **Site Agent** with BEng/BTech in Electrical or Mechanical engineering with more than 7 years of experience in water distribution pipelines, installation of smart water flow meters, smart chambers and valves –**15 Points** c) **OHS Officer** with a tertiary qualification in occupational health and safety and registered with SACPCMP as a Professional Construction Health and Safety Officer The officer should have more than 5 years of relevant experience in water distribution pipelines, installation of smart water flow meters, smart chambers and valves **- 10 Points**	**20**
3. Methodology and Programme	
The Bidder must submit a proposed Methodology and Programme of work illustrating their understanding of tender scope of works. This representation should show phases of the tasks and where necessary, sub-tasks. The work Programme must be presented in a Gantt chart (MS Projects) illustrating the dates at which critical milestones can be reached and indicating the critical path as well as tie-ins, switch overs, commissioning/test on completion as well the delivery dates/durations for long lead time items. a) Methodology and proposed approach indicating the understanding of the scope of work (Limited to 10 x A4 pages, single sided pages, single line spacing and size 10 font): … - **5 Points** b) Programme in a Gantt Chart format – **5 Points**	**10**

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

4. Locality	
Locality points will be awarded as follows: a) Tenderers with offices with offices based within the Free State and Northern Cape Provinces - **20 Points** b) Tenderers with offices not based within the Vaal Central Water Board area of supply – **0 Points** *Original (or certified copy) of municipal rates clearance certificate or a certified copy of the lease agreement (Vaal Central Water reserves the right to conduct physical verification of premises). Not older than 3 months"*	**20**
5. Financial Capacity	
Due to the estimated value of this enquiry, the tenderer will be required to confirm working capital in respect of this bid by furnishing with the tender submission, an original valid letter from his/her bank providing a bank rating. *Copies will not be acceptable.* Only those tenderers who receive a minimum "C" rating shall be eligible to tender. a) Bank Rating B or available cash reserve of R 1.5 million or above - **15 Points** b) Bank Rating C **- 7 Points** c) Bank Rating below C or no rating provided **– 0 points** *Tenderer to submit certified copies of Company Audited Financial Statements for the past 3 years*	**15**
Total Points	**100**

The Bidder must comply with the minimum requirements in accordance with the functionality criteria listed above and must score at least **75 percent** for Functionality. Bids that fall below the minimum threshold of 75 percentage will be regarded technically unacceptable and **will not be considered for further evaluation.**

	Only Bidders scoring a minimum of **75** percent will be considered for further evaluation. The points scoring for price and B-BBEE contribution will be a function of the financial value in accordance with: a) Clause 3.11.3 where the financial value inclusive of VAT of one or more responsive bid offers equals or is less than R 50 000 000; or b) Clause 3.11.4 where the financial value inclusive of VAT of all responsive bids received have a value in excess of R 50 000 000.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

3.11.3	Add the following sub-clause: **The 90/10 preference point system for acquisition of services, works or goods up to Rand value of above R 50 million will apply; or** **The 80/20 preference point system for acquisition of services, works or goods up to Rand value of R 50 million will apply.** a) The following formula must be used to calculate the points for price in respect of bids (including price quotation) with a rand value equal to, or above R 30 000 and up to Rand value of R 50 000 000 (all applicable taxes included): $Ps = 80 \times \left[1 - \frac{Pt - Pmin}{Pmin}\right]$ *Where:* *Ps = Points scored for comparative price of bid or offer under consideration.* *Pt = Comparative price of bid or offer under consideration; and* P_{min} = *Comparative price of lowest acceptable bid or offer.* b) An employer of state may apply the formula in paragraph (a) for price quotations with a value less than R 30 000, if and when appropriate c) Subject to subparagraph (d), points must be awarded to a bid for attaining the B-BBEE status level of contributor in accordance with the table below:

Clause	Addition or Variation to Standard Conditions of Tender

3.11.4	

3.16.2	Replace the contents of the clause with the following: Notice of non-acceptance of bid will not be sent to individual unsuccessful Bidders. Particulars of the accepted bid can be obtained from the employer's agent.
3.17	The successful Bidder shall receive one copy of the signed contract.

Clause	Addition or Variation to Standard Conditions of Tender
4.3	General Supply Chain Management conditions applicable to tenders In terms of its Supply Chain Management Policy the Employer may not consider a tender unless the provider who submitted the tender: a) has furnished the Employer with that provider's: ☐ full name; ☐ identification number or company or other registration number; and ☐ tax reference number and VAT registration number, if any; ☐ Certificate of attendance at a compulsory site inspection, where applicable. b) has indicated whether: ☐ the provider is in the service of the state, or has been in the service of the state in the previous twelve months; ☐ the provider is not a natural person, whether any of the directors, managers, principal shareholders or stakeholders is in the service of the state, or has been in the service of the state in the previous twelve months; or ☐ whether a spouse, child or parent of the provider or of a director, manager, 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. 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; ☐ if the person is not a natural person, a juristic entity of which any director, manager, principal shareholder or stakeholder is in the service of the state; or In this regard, Bidders 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.

F4.4	Combating abuse of the Supply Chain Management Policy In terms of its Supply Chain Management Policy, the Employer may reject the tender of any Bidder if that Bidder or any of its directors has: a) failed to pay municipal rates and taxes or municipal service charges and such rates, taxes and charges are in arrears for more than three months: b) failed, during the last five years, to perform satisfactorily on a previous contract with the Employer or any other organ of state after written notice was given to that Bidder 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, Bidders shall complete Schedule 2 and 4, Part T2.2: Returnable Schedules: Certificate of Independent Tender Determination and Declaration in terms of the Public Finance Management Act. Failure to complete these schedules may result in the tender not being considered.
F.4.8	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 contained in the Conditions of Contract and Scope of Work, will be admitted by the Employer after the submission of any tender and the Bidder shall be deemed to have: 1) Fully understood the Conditions of Contract. 2) Read and fully understood the whole text of the Scope of Work and thoroughly acquainted him with the nature of the works proposed and generally of all matters which may influence the Contract. 3) Visited the site of the proposed works, carefully examined existing conditions, the means of access to the site, the conditions under which the work is to be done, and acquainted himself with any limitations or restrictions that may be imposed by the Employer or other Authorities in regard to access and transport of materials, plant and equipment to and from the site and made the necessary provisions for any additional costs involved thereby. 4) Requested the Employer or his duly authorised agent to make clear the actual requirements of anything contained in the Scope of Work, the exact meaning or interpretation of which is not clearly intelligible to the Bidder.

F.4.10	Requests for contract documents, or parts thereof, in electronic format The Employer shall not formally issue tender documents in electronic format as contemplated in F.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 Bidder, upon written request in terms of this clause, subject to the following: a) The electronic version shall not be regarded as a substitute for the issued tender documents. b) The Employer shall not accept tenders submitted in electronic format. Bidders may not complete and submit a printed copy of the electronic version of the tender document or part thereof. Only those tenders that have been completed on the issued hard copy tender document shall be considered. c) 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. Bidders are alerted to the fact that electronic versions of the tender documents may not reflect any notices or addenda that amend the tender document. d) Any non-compliance with these provisions, including effecting any unauthorised alterations to the tender document as contemplated in F.2.11, shall render the tender invalid. The Employer reserves the right to take any action against such Bidder allowed in law including, in circumstances where the tender had already been awarded, the right to cancel the contract. e) In requesting the electronic version of the tender document or parts thereof, the Bidder is deemed to have read, understood and accepted all of the above conditions.

END OF SECTION

VAAL CENTRAL WATER

CONTRACT No: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION T1.3

STANDARD CONDITIONS OF TENDER

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

STANDARD CONDITIONS OF TENDER

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These standard conditions of tender are identical to those published in SANS 294:2004 (Annex F)

VAAL CENTRAL WATER

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INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

STANDARD CONDITIONS OF TENDER

1. GENERAL

1.1. Actions

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

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 t 1) 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.*

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

1.2. Tender Documents

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

1.3. Interpretation

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.

1.3.2 These conditions of the tender, the tender data and tender schedules which are only required for tender evaluation purposes, shall not form part of any contract arising from the invitation to tender.

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 fulfill his or her duties impartially;

ii) an individual or organisation 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 organisation which 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;

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.

1.5. Cancellation and Re-invitation of Tenders

1.5.1. An organ of state 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 services, works or goods requested; or

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

(c) no acceptable tenders are received.

(d) There is material irregularity in the tender process

1.5.2. The decision to cancel a tender must be published in the CIDB website and in the government Tender Bulletin for the media in which the original tender invitation was advertised.

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

1.6. Procurement Procedures

1.6.1. General

Unless otherwise stated in the tender data, a contract will, subject to 3.13, be concluded with the tenderer who in terms of 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.

1.6.2. Competitive negotiation procedure

1.6.2.1 Where the tender data requires 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 3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of 3.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

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

Notwithstanding the provisions of 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.

1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to make a fresh 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.

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

1.6.3. Proposal procedure using the two stage-system

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.

1.6.3.2 Option 2

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.

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.

2. TENDERER'S OBLIGATIONS

2.1. Eligibility

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.

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.

2.2. Cost of tendering

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.

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.

2.3. Check documents

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

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.

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.

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.

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.

2.8. Seek clarification

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

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.

2.10. Pricing the tender offer

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 14 days before the closing time stated in the tender data.

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

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.

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.

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.

2.12. Alternative tender offers

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.

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

2.12.3 An alternative tender offer may only be considered in the event that the main tender offer is the winning tender.

2.13. Submitting a tender offer

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, services or supply identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

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.

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.

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.

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.

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.

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.

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.

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.

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.

2.15. Closing time

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.

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.

2.16. Tender offer validity

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.

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.

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.

2.16.4 Where a tender submission is to be substituted, submit a substitute tender in accordance with the requirements of .2.13 with the packages clearly marked as "SUBSTITUTE"

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 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.*

2.18. Provide other material

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.

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

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.

2.20. Submit securities, bonds, policies, etc.

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.

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.

2.22. Return of other tender documents

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

2.23. Certificates

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

3. THE EMPLOYER'S UNDERTAKINGS

3.1. Respond to requests from the tenderer

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

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.

3.2. Issue Addenda

If necessary, issue an 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 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 then notify all tenderers who drew documents.

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.

3.4. Opening of tender submissions

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.

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 preference status level and time for completion for the main tender offer only.

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

3.5. Two-envelope system

3.5.1 Where stated in the tender data that a two-envelope system is not to be followed, open the technical and financial 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.

3.5.2 Evaluate the 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 preference status

level. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for functionality.

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.

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.

3.8. Test for responsiveness

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.

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.

3.9. Arithmetical errors, omissions and discrepancies

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.

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 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.

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

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.

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.

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

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.

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.

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, 2008, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his 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.

3.14. Prepare contract documents

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.

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

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.

3.16. Registration of the award

An employer must, within twenty-one (21) 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.

3.17. Provide copies of the contracts

Provide for 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.

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.

VAAL CENTRAL WATER

CONTRACT NO. VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

PART T2: RETURNABLE DOCUMENTS AND SCHEDULES

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

RETURNABLE DOCUMENTS

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VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION T2.1: RETURNABLE SCHEDULES

REQUIRED FOR BID EVALUATION PURPOSES

VAAL CENTRAL WATER

CONTRACT NO. VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

T2.1 RETURNABLE SCHEDULES REQUIRED FOR BID EVALUATION PURPOSES

The tenderer must complete the following returnable documents:

VOLUME 1 & 2: TENDER DOCUMENT in its entirety.

The information the tenderer shall supply in his tender or attached to his tender shall include, but not be limited to the documents and schedules as set out below.

Other documents required for tender evaluation purposes:

Standard Bidding Documents (SBD)

The following standard SBD's should be completed (if applicable) legibly and in full in terms of the requirements of the National Treasury of the Republic of South Africa:

SBD1: Invitation to bid and company information

SBD 4: Disclosure Form

SBD 6.1: Preference points claim form in terms of preferential procurement regulations 2022

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION T2.1: RETURNABLE SCHEDULES

REQUIRED FOR BID EVALUATION PURPOSES

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PART A

INVITATION TO BID

PART A
INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (*NAME OF DEPARTMENT/ PUBLIC ENTITY*)					
BID NUMBER:	**VCW402/MCV/NFS/25**	CLOSING DATE:	**21 November 2025**	CLOSING TIME:	**12:00**
DESCRIPTION	**INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION.**				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (SBD7).					
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT *(STREET ADDRESS)*:					
2 MZUZU STREET, PELLISSIER, BLOEMFONTEIN 9301 OR CAN BE ELECTRONICALLY SUBMITTED BY EMAIL TO bids@vcwater.co.za					

SUPPLIER INFORMATION				
NAME OF BIDDER				
POSTAL ADDRESS				
STREET ADDRESS				
TELEPHONE NUMBER	CODE		NUMBER	
CELLPHONE NUMBER				
FACSIMILE NUMBER	CODE		NUMBER	
E-MAIL ADDRESS				
VAT REGISTRATION NUMBER				
	TCS PIN:		**OR** CSD No:	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX]	☐ Yes ☐ No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT	☐ Yes ☐ No
IF YES, WHO WAS THE CERTIFICATE ISSUED BY?				

AN ACCOUNTING OFFICER AS CONTEMPLATED IN THE CLOSE CORPORATION ACT (CCA) AND NAME THE APPLICABLE IN THE TICK BOX	☐	AN ACCOUNTING OFFICER AS CONTEMPLATED IN THE CLOSE CORPORATION ACT (CCA)
	☐	A VERIFICATION AGENCY ACCREDITED BY THE SOUTH AFRICAN ACCREDITATION SYSTEM (SANAS)
	☐	A REGISTERED AUDITOR
		NAME:

[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/SWORN AFFIDAVIT(FOR EMEs& QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]

ARE YOU THE ACCREDITED REPRESENTATIVE **IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?**	☐Yes ☐No [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES /WORKS OFFERED?**	☐Yes ☐No [IF YES ANSWER PART B:3 BELOW]
SIGNATURE OF BIDDER	……	**DATE**	
CAPACITY UNDER WHICH THIS BID IS SIGNED (Attach proof of authority to sign this bid; e.g. resolution of directors, etc.)			
TOTAL NUMBER OF ITEMS OFFERED		**TOTAL BID PRICE (ALL INCLUSIVE)**	

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:		**TECHNICAL INFORMATION MAY BE DIRECTED TO:**	
DEPARTMENT/ PUBLIC ENTITY		CONTACT PERSON	
CONTACT PERSON		TELEPHONE NUMBER	
TELEPHONE NUMBER		FACSIMILE NUMBER	
FACSIMILE NUMBER		E-MAIL ADDRESS	
E-MAIL ADDRESS			

PART B
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 RE-TYPED) OR ONLINE

1.3. BIDDERS MUST REGISTER ON THE CENTRAL SUPPLIER DATABASE (CSD) TO UPLOAD MANDATORY INFORMATION NAMELY: (BUSINESS REGISTRATION/ DIRECTORSHIP/ MEMBERSHIP/IDENTITY NUMBERS; TAX COMPLIANCE STATUS; AND BANKING INFORMATION FOR VERIFICATION PURPOSES). B-BBEE CERTIFICATE OR SWORN AFFIDAVIT FOR B-BBEE MUST BE SUBMITTED TO BIDDING INSTITUTION.

1.4. WHERE A BIDDER IS NOT REGISTERED ON THE CSD, MANDATORY INFORMATION NAMELY: (BUSINESS REGISTRATION/ DIRECTORSHIP/ MEMBERSHIP/IDENTITY NUMBERS; TAX COMPLIANCE STATUS MAY NOT BE SUBMITTED WITH THE BID DOCUMENTATION. B-BBEE CERTIFICATE OR SWORN AFFIDAVIT FOR B-BBEE MUST BE SUBMITTED TO BIDDING INSTITUTION.

1.5. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER LEGISLATION OR SPECIAL CONDITIONS OF CONTRACT.

2. TAX COMPLIANCE REQUIREMENTS

2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.

2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.

2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) 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 BIDDERS MAY ALSO SUBMIT A PRINTED TCS TOGETHER WITH THE BID.

2.5 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE PROOF OF TCS / PIN / CSD NUMBER.

2.6 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 BIDDER A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	☐ YES ☐ NO
3.2.	DOES THE BIDDER HAVE A BRANCH IN THE RSA?	☐ YES ☐ NO
3.3.	DOES THE BIDDER HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	☐ YES ☐ NO
3.4.	DOES THE BIDDER HAVE ANY SOURCE OF INCOME IN THE RSA?	☐ YES ☐ NO

IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN, IT IS NOT A REQUIREMENT TO OBTAIN A TAX COMPLIANCE STATUS / TAX COMPLIANCE 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.

SBD 4

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. Bidder's declaration

2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest1 in the enterprise,

employed by the state? **YES/NO**

2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	**Identity Number**	**Name of State institution**

[1] the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

2.2 Do you, or any person connected with the bidder, have a relationship with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:

……

……

2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract? **YES/NO**

2.3.1 If so, furnish particulars:

……

……

3 DECLARATION

I, the undersigned, (name)…… in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

3.1 I have read and I understand the contents of this disclosure;

3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;

3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium2 will not be construed as collusive bidding.

3.4 In addition, there have been no consultations, communications, agreements or arrangements with any

[2] 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.

competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.

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

3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

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

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.

I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

…… ……

Signature Date

…… ……

Position Name of bidder

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

1.2 To be completed by the organ of state

The applicable preference point system for this tender is the 80/20 or 90/10 preference point system.

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

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

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

	POINTS	POINTS
PRICE	**80**	**90**
SPECIFIC GOALS	**20**	**10**
Total points for Price and SPECIFIC GOALS	**100**	**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 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

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

80/20 **or** **90/10**

$$Ps = 80\left(1 - \frac{Pt - Pmin}{Pmin}\right) \quad \text{or} \quad Ps = 90\left(1 - \frac{Pt - Pmin}{Pmin}\right)$$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

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

3.2.1 POINTS AWARDED FOR PRICE

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

80/20 **or** **90/10**

$$\mathbf{Ps = 80\left(1 + \frac{Pt - Pmax}{Pmax}\right)} \quad \textbf{or} \quad \mathbf{Ps = 90\left(1 + \frac{Pt - Pmax}{Pmax}\right)}$$

Where

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

4. POINTS AWARDED FOR SPECIFIC GOALS

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

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

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

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

Table 1: Specific goals for the tender and points claimed are indicated per the table below.

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

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

The specific goals allocated points in terms of this tender		**Number of points allocated (80/20 system) (To be completed by the organ of state)**	**Number of points allocated (90/10 system) (To be completed by the organ of state)**	**Number of points claimed (80/20 system) (To be completed by the tenderer)**	**Number of points claimed (90/10 system) (To be completed by the tenderer)**
Categories of specific goals	**Requirements**				
Blacks and people who had no franchise on national elections before 1994 constitution (more than 50% ownership)	Certified ID copy and CIPC registration/ CSD report	3	2		
Women (more than 50% ownership) Or Youth (more than 50% ownership) Or People with disability (more than 50% ownership)	Certified ID copy and CIPC registration/ CSD report Or Certified ID copy and CIPC registration/ CSD report Or Medical report sanctioned by qualified professional and CIPC registration/ CSD report	2	1		

The specific goals allocated points in terms of this tender		**Number of points allocated (80/20 system) (To be completed by the organ of state)**	**Number of points allocated (90/10 system) (To be completed by the organ of state)**	**Number of points claimed (80/20 system) (To be completed by the tenderer)**	**Number of points claimed (90/10 system) (To be completed by the tenderer)**
Located in a specific Local Area of Supply for work to be done Free State and Northern Cape Provinces	Official Municipal Rates Statement which is in the name of the bidder Or Valid Lease agreement which is in the name of the bidder and the lessor. Or Permission to Occupy from Local Chief in the case of Rural areas which is in the name of the bidder (Vaal Central Water reserves the right to verify all addresses)	10	4		
Promotion of BBBEE companies	**Sworn affidavits/ CIPC/ BBBEE certificate**	5	**3**		
BBBEE Level 1		5	3		
BBBEE Level 2		2	1		
BBBEE Level 3		0	0		
BBBEE Level 4+		0	0		
Total Points		**20**	**10**		

Notes to complete table for specific goals:

THE FOLLOWING DOCUMENTS MUST BE ATTACHED AS PROOF OF THE POINTS CLAIMED.

A: BBEEE for EME and QSE

- Sworn affidavit signed by the company representative and attested by a Commissioner of Oaths
- A certified copy of a BBBEE certificate
- CIPC registration / CSD report

B: Women Owned Companies of Ownership

- Certified RSA identity document
- CIPC registration / CSD report

C: Youth Owned Companies or Ownership

- A tenderer must submit a copy of their CIPC company registration and /or shareholder certificate as proof, which shows ownership or share certificate documents and ID of owners. The youth owners should be less than 35 years at the time of submission of tender to claim these points.
- Certified RSA identity document
- CIPC registration / CSD report

D: Persons with Disability Owned Companies or Ownership

- Medical report sanctioned by qualified professional and
- Certified RSA identity document
- CIPC registration / CSD report

E: Locality of supplier. Tenderers should complete one relevant row for points claimed.

- The municipal rates and taxes statement, which is in the name of the company, not older than three (3) months; or
- The Clearance Certificate issued by the bidding companies' local municipality, which is in the name of the company, not older than three (3) months; or
- The completed Municipal Form with either the stamp of the municipality or the landlord, which is in the name of the company, not older than three (3) months. (If the landlord does

not have a stamp, please attach the lease agreement and landlord's municipal account statement).

- An official letter which is in the name of the company from the local tribal authority, not older than three (3) months; or
- A valid signed lease agreement which is in the name of the company, that clearly shows the business address (not expired at closing date); or
- If the municipal rates and taxes statement is in the Landlord's or Director's name an affidavit certified by the commissioner of oaths **must** be attached indicating that the company/enterprise is operating from the stated addressed, **accompanied** by their municipal rates and taxes statement (not older than three (3) months).

NB: If no proof is attached the tenderer will not be awarded the points claimed.

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3 Name of company/firm .....

4.4 Company registration number: .....

4.5 TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

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

i) The information furnished is true and correct.
ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form.

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

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

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

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

SURNAME AND NAME: .....

DATE: .....

ADDRESS: .....

.....

.....

.....

T2.1.4: RECORD OF ADDENDA TO BID DOCUMENTS

We confirm that the following communications received from the Procuring Department before the submission of this bid offer, amending the bid documents, have been taken into account in this bid offer:

	Date	**Title or Details**
1		Confirmatory notes of compulsory site/clarification meeting
2		
3		
4		
5		
6		
7		
8		
9		

Attach additional pages if more space is required.

…… ……

Signature of Authorized person Date:

Name: ……..…..

Position: ……..

T2.1.5: CERTIFICATE OF ATTENDANCE AT CLARIFICATION MEETING

This is to certify that *(tenderer)*.....of

(address).....

..... *was represented by the person(s) named below at the compulsory meeting held for all tenderers at (location)*.....on

(date)..... starting at *(time)* .....

I / We acknowledge that the purpose of the meeting was to acquaint myself / ourselves with the Site of the Works and its surroundings and / or matters incidental to doing the work specified in the Tender Documents in order for me / us to take account of everything necessary when compiling our rates and prices included in the tender. I / We also acknowledge that I / we have examined the Site Data made available by the Employer (including borehole cores and related information).

Particulars of person(s) attending the meeting:

Name: ....

Signature: .....

Capacity: .....

Name: ....

Signature: .....

Capacity: .....

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

Name: ..... Signature: .....

Capacity: ..... Date and Time: .....

T2.1.6: REGISTRATION CERTIFICATE/AGREEMENT/POWERS OF ATTORNEY/ID DOCUMENT (IF APPLICABLE)

Important note to Tenderer: Registration Certificates for Companies, Close Corporation and Partnerships, or Agreements and Powers of Attorney for Joint Ventures, or certified ID Documents for company directors, trustees, or Sole Proprietor, and certified founding statement if the Tenderer is a closed Corporation, certified copy of disability medical certificate(s) where applicable, all as referred to in the foregoing forms and in T2.2.6 must be inserted here.

T2.1.7: PROPOSED JOINT VENTURE AGREEMENT

The following legal business entities agree to deliver the services and/or goods as required under this Contract as a Joint Venture as follows:

Name and Addresses of Joint Venture: …….

…….

……. Consisting of the following businesses (Joining Entities)

NAME JOINING ENTITY	TAX No	PROPORTIONAL PAYMENT THAT WILL BE RECEIVED UNDER THIS CONTRACT
.....	.....	..... %
.....	.....	..... %
.....	.....	..... %
.....	.....	..... %
.....	.....	..... %

The above-mentioned Joint venture will execute the Contract under the management of (full name)

.....

who is an employee of (name of joining entity)

..... ; and in accordance with any further agreements as attached to this document, titled

.....

and dated ……...(if applicable).

Bank guarantees and retention money (where required) will be provided or paid by (name of joining entity)

.....

who will be responsible for the fulfilment of the retention obligations (where required) asset out in the Contract Document.

Signed by the duly authorized representatives of the above-mentioned Joint Entities:

JOINING ENTITY AND POSITION

.....	**FULL NAME (Position)**	**SIGNATURE**	**DATE**
.....			
.....	.....	.....	.....
	.....	.....	.....
.....	.....	.....	.....
	.....	.....	.....
.....			

WITNESSES:.....

1. .....

2. .....

T2.1.8: CERTIFICATE OF AUTHORITY OF SIGNATURE

Indicate the status of the Tenderer by ticking the appropriate box hereunder. The Tenderer must complete the certificate set out below for the relevant category.

(I) COMPANY	(II) CLOSE CORPORATION	(III) PARTNERSHIP	(IV) JOINT VENTURE	(V) SOLE PROPRIETOR

All signatories**, including sole proprietors**, shall confirm their authority by **attaching to this page of this tender** a duly signed and ***dated original or certified copy*** of the relevant resolution of their members or their board of directors, as the case may be

(I) Certificate for Company

I, ……, chairperson of the Board of Directors of …….

....., hereby confirm that by resolution of the Board (copy

attached) taken on ..... 20....., Mr/Ms.....,

acting in the capacity of....., was authorized to sign all documents in connection with the tender for Contract No: BW268/WTW/ODEN/22 and any contract resulting from it on behalf of the company.

Chairman: .....

As Witnesses: 1.....

2.....

Date: .....

(II) Certificate for Close Corporation

We, the undersigned, being the key members in the business trading as

.....

hereby authorize Mr/Ms ..... , acting in the capacity of

....., to sign all documents in connection with the tender for Tender Contract No: VCW402/MCV/NFS/25 and any contract resulting from it on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

Note: This certificate is to be completed and signed by all key members upon whom rests the direction of the affairs of the Close Corporation as a whole.

(III) Certificate for Partnership

We, the undersigned, being the key partners in the business trading as,

.....,

hereby authorize Mr/Ms .....

acting in the capacity of .....,, to sign all documents in connection with the tender for Tender Contract No: VCW402/MCV/NFS/25 and any contract resulting from it on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

Note: This certificate is to be completed and signed by all key partners upon who rests the direction of the affairs of the partnership as a whole.

(IV) **Certificate of Authority for Joint Ventures**

This Returnable Schedule is to be completed by joint ventures.

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorise Mr/Ms . . .. , authorised signatory of the company . . . .

(V) Certificate for Sole Proprietor

I, ..., hereby confirm that I am the sole owner of

the Business trading as.....

Signature of sole owner: ..... Date: .....

As Witnesses:

1..... Date: .....

2. ..... Date: .....

T2.1.9: TAX CLEARANCE CERTIFICATE

Tax Clearance Certificate obtained from SARS to be inserted here.

IMPORTANT NOTES:

1. The following is an abstract from the Preferential Procurement Regulations 2022 promulgated with the Preferential Policy Framework Act No 5 of 2000:

Tax clearance certificate

No contract may be awarded to a person who has failed to submit an **original** Tax . Clearance Certificate from the South African Revenue Service ("SARS") certifying the taxes of that person to be in order or those suitable arrangements have been made with SARS."

2. The ST 5.1 form, Application for Tax Clearance Certificate (in respect of tenders), must be completed by the tenderer in every detail and submitted to the Receiver of Revenue where the tenderer is registered for income tax purposes. The Receiver of Revenue will then furnish the tenderer with a Tax Clearance Certificate that will be valid for 6 months from date of issue. This Tax Clearance Certificate must be submitted in the original form with the tender that is before the closing time and date of the tender.

Each party to a Consortium / Joint Venture / Subcontractors must complete a separate Tax Clearance Certificate.

Failure to ensure tax compliance as per the prescribed timeframe will invalidate the tender.

T2.1.10: LATEST UIF RETURN

The Tenderer must attach hereto a certified copy of the latest Unemployment Insurance Fund return.

Unemployment Insurance Contributions Act, No. 4 of 2002 CHAPTER 2

Duty to contribute and recovery of contributions

5. Duty to contribute to Fund

(1) Every employer and every employee to whom this Act applies must, on a monthly basis, contribute to the Unemployment Insurance Fund.

(2) The contributions must be paid by the employer either to the Commissioner in terms of section 8 or to the Unemployment Insurance Commissioner in terms of section 9, whichever is applicable to the particular employer.

T2.1.11 LATEST MUNICIPAL RATES AND TAXES CLEARANCE CERTIFICATE OR COPY OF VALID LEASE AGREEMENT (IF RENTING)

The Tenderer must attach hereto a certified copy of their latest municipal rates and taxes clearance certificate or a copy of a valid lease agreement (if renting). The rates and taxes clearance certificate must not be older than 3 months from the tender closing date and will be used to award points of locality as stipulated in Section T1.2: Tender Data clause 3.11.3.

T2.1.12: PROOF OF EXPENDITURE FOR SKILLS DEVELOPMENT

The Tenderer must attach hereto certified proof of expenditure on skills development as required.

SKILLS DEVELOPMENT LEVIES ACT 1, 1999

3. Imposition of levy

(1) Every Employer must pay a skills development levy

T2.1.13: LETTER OF GOOD STANDING WITH COMPENSATION COMMISSIONER OR WITH A LICENSED COMPENSATION INSURER

The Tenderer must attach hereto certified copy of Letter of good standing with Compensation Commissioner or with a licensed compensation insurer

T2.1.14: B-BBEE STATUS LEVEL CERTIFICATE OF CONTRIBUTOR IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022)

1) Bidders are required to submit original and valid B-BBEE Status Level Verification Certificates or certified copies thereof together with their bids, to substantiate their B-BBEE rating claims.
2) 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 BBBEE but should not be disqualified from the bidding process. They will score points out of 90 or 80 for price only and zero (0) points out of 10 or 20 for BBBEE.
3) A trust, consortium or joint venture must submit a consolidated B-BBEE Status Level Verification Certificate for every separate bid.
4) Public entities and tertiary institutions must also submit B-BBEE Status Level Verification Certificates together with their bids.

T2.1.15: FORM OF INTENT TO PROVIDE A PERFORMANCE GUARANTEE

The Tenderer must attach hereto a letter from the bank or institution with whom he has made the necessary arrangements, to the effect that the said bank or institution will be prepared to provide the required performance guarantee when asked to do so.

T2.1.16: TENDERER'S EXPERIENCE

The Tenderer must attach proof of experience in the applicable class of works (Attach Completion letters/Certificates and include contactable reference names and numbers). Tenderer's experience in projects of total construction value R 50 million or more **AND where** the scope of works included the installation of PN 16 smart water billing meters and smart chambers where such experience MUST include the following elements in the scope:

a. Replacement of Billing Smart Magflo Meter Isomag WaMSS Scada Web Based with built-in transmission, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device
b. Installation of Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device
c. Installation of Valves
d. Supply & Install WaMMS Scada System Web Based complete
e. Training and licensing of software

T2.1.17: KEY PERSONNEL DETAILS

The Tenderer must attach documents which demonstrates the expertise of key personnel doing site supervision, related to this project (Attach CV and certified qualification and professional registration certificates where applicable). The required submissions are articulated in Part T1.2: Tender Data under clause 3.11.3

T2.1.18: METHODOLOGY AND PROGRAMME

The Bidder must submit a proposed programme of work illustrating their understanding of works. This representation should show phases of the tasks and where necessary, sub-tasks. The work programme must be presented in a Gantt chart (MS Projects) illustrating the dates at which critical milestones can be reached and indicating the critical path.

T2.1.19: FINANCIAL STATEMENTS

The Tenderer must attach certified copies Audited Financial Statements for the past 3 years and an **ORIGINAL** bank rating. Copies of the bank rating will not be acceptable.

T2.1.20: CIDB REGISTRATION CERTIFICATE

The Tenderer must attach a certified Construction Industry Development Board (**CIDB)** registration certificate in compliance with the Construction Industry Development Board Act 38 of 2000. It is estimated that tenderers should have a CIDB Contractor Grading designation of **7 ME OR EP/HIGHER** in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations, 2004. Potentially emerging (PE) enterprises who satisfy the criteria stated in the bid document may submit bid offers.

T2.1.21: TENDERER'S PLANT RESOURCES

The tenderer must submit certified proof of ownership or access to resources (lease agreement), Plant, equipment and tools for the works. These plant, equipment and tools should also be captured in Section T2.2: Other Documents Required for Tender Evaluation Purposes, under T2.2.7: Plant and Equipment

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION T2.2: OTHER DOCUMENTS REQUIRED FOR BID EVALUATION PURPOSES

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION T2.2: OTHER DOCUMENTS REQUIRED FOR BID EVALUATION PURPOSES

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T2.2.1: ALTERATIONS BY TENDERER

Should the Tenderer desire to make any departures from or modifications to the General or Special Conditions of Contract, the Specifications, the Schedule of Quantities or the Drawings, or to qualify his tender in any way, he shall set out his proposals clearly hereunder or alternatively state them in a covering letter attached to his tender and referred to hereunder, failing which the tender will be deemed to be unqualified.

Page	Clause or Item

Signature of Tenderer: ..... Date: .....

T2.2.2: WORKS PREVIOUSLY EXECUTED

The following is a statement of major works successfully executed by myself/ourselves in recent years:

Employer	Contractor *	Nature of Works	Value of Works	Duration and Completion Date

Failure to detail the required information, shall signify that the tender is submitted by an inexperienced tenderer.

Signature of Tenderer:_____

State Firm, contact person and telephone number: Date:_____

_____

_____

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

T2.2.3: PRESENT COMMITMENTS

Employer	Contractor *	Nature of Works	Value of Works	Duration and Completion Date

Signature of Tenderer:_____ Date:_____

State firm, contact person and telephone number:……

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

T2.2.4: SUPERVISORY AND SAFETY PERSONNEL

PREVIOUS EXPERIENCE ON WORKS OF A SIMILAR NATURE DURING THE LAST FIVE YEARS

Name	% Time on Site	Position (Current)	Service (Years)	Name of Project And year executed	Value of Works	Position Occupied
Construction Health and Safety						

Tenderers shall indicate the percentage of working time these persons will be engaged on site. Tenderers are required to provide copies of curriculum vitas of all supervisory and safety personnel.

Signature of Tenderer:_____ Date:_____

T2.2.5: LABOUR UTILISATION

Labour Categories - Definitions

NOTE: These definitions serve as a guideline to complete the following table and will in no respect alter the Project Specifications or Standardized Specifications:

1. General Foreman / Foreman

An employee who gives out work to and directly co-ordinates and supervises employees. His duties encompass any one or more of the following activities:

a) Supervision;

b) maintaining discipline;

c) ensuring safety on the workplace;

d) being responsible to the Contractor for efficiency and production for his portion of the works; and

e) performing skilled work, whether in an instructional capacity or otherwise.

2. Charge hand

An employee engaged in any one or more of the following activities:

a) Being primarily employed in a supervisory capacity, but who may also be doing the work of an artisan;

b) giving out work to other employees under his control and supervision;

c) ensuring safety on the workplace;

d) maintaining discipline; and

e) being directly responsible to a general foreman or foreman or the Contractor or the

Contractor's representative for efficiency and production for his portion of the works.

3. Artisan

An employee who has successfully completed all prescribed courses at a practical institutional training centre for a particular trade and who has successfully completed the on-site period of training as prescribed and who has successfully passed the prescribed trade tests.

4. Team Leader

An employee engaged in any one or more of the following activities :

a) Being employed in a supervisory capacity, but who may also be doing the work of a skilled person;

b) giving out work to other employees under his control and supervision;

c) maintaining discipline;

d) being directly responsible to a Charge hand or a foreman or a general foreman or the employer's authorized representative for efficiency and production for his portion of the works.

5. Skilled Employee

An employee engaged in an ancillary trade or an assistant artisan.

6. Semi-Skilled Employee

An employee with any specified skills, an apprentice or a trainee-artisan.

7. Unskilled Employee

An employee engaged on any task or operation not specified above.

8. Imported Employee

Personnel permanently employed by Contractor.

9. Local Employee

Temporary workforce employed through Labour Desk.

MAN DAYS

Categories	No. of Man Days	
	Imported	Local
1. Contracts Manager		
2. Site Agent		
3. Foreman/Supervisors (specify type)		
3.1 _		
3.2 _		
3.3 _		
4. Safety Inspectors (specify type)		
4.1 _		
4.2 _		
5. Charge hands		

Signature of Tenderer: _____ Date: _____

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

T2.2.6: COMPLIANCE WITH OHSA (ACT 85 OF 1993)

Tenderers are required to satisfy the Employer and the Engineer as to their ability and available resources to comply with the above by answering the following questions and providing the relevant information required below.

1. Is the Contractor familiar with the OHSA (ACT 85 OF 1993) and its Regulations? **YES/NO**

2. Who will prepare the Contractors Health and Safety Plan? (Provide a copy of the person/s curriculum vitae/s or company profile).

_____

3. Does the Contractor have a health and safety policy? (If yes, provide a copy). … **YES/NO**
   How is this policy communicated to all employees?

_____

4. Does the Contractor keep records of safety aspects of each construction site? .... **YES/NO**
   If yes, what records are kept?

_____

5. Does the Contractor conduct monthly safety meetings? If yes, who is the chairperson of the meeting, and who attends these meetings? **YES/NO**

_____

6. Does the Contractor have a safety officer in his employment, responsible for the overall safety of his company? **YES/NO**

If yes, please explain his duties and provide a copy of his CV.

_____

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

7. Does the Contractor have trained first aid employees? If yes, indicate who. **YES / NO**

8. Does the Contractor have a safety induction training programme in place? (If yes, provide a copy). **YES / NO**

Signature of Tenderer: _____ Date: _____

T2.2.7: PLANT AND EQUIPMENT

1. Major Plant and Equipment available for this Contract:

Quantity	Size, Description, Capacity, etc.

2. Major Plant and Equipment that will be acquired for this contract if my/our tender is accepted:

Quantity	Size, Description, Capacity, etc.

Signature of Tenderer: _____ Date: _____

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

T2.2.8: SUB-CONTRACTORS

The tenderer shall list below any subcontractors he intends to employ to carry out part(s) of the Works.

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

Company	Portion of Contract	Approx. Value

Signature of Tenderer: _____ Date: _____

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

T2.2.9: SITE INSPECTION CERTIFICATE

As required by Clause 2.7 of the Tender Data, I/we certify that I/we have visited the site of the Works and attended the compulsory site visit and clarification meeting on the date certified below.

I/we further certify that I am / we are satisfied with the description of the Work and the explanations given by the Engineer at the site visit and clarification meeting.

_____ _____

Signature of Tenderer Date

Site Visit

This will certify that_____

representing _____

attended a Site Inspection for this Contract on _____20_____

_____ (Signed) For the Engineer

T2.2.10: AFFIDAVIT

Affidavit to be completed by every member of a company, closed corporation, trust, partnership or other business entity, claiming preference points regarding their HDI-status:

1. I, the undersigned ……., hereby

(Full name and surname)

Certify that I am a …… of the tenderer.

(Member, Director, Partner, Owner)

2. I furthermore certify that I personally hold ……..% (percent) equity shares in the above-mentioned business venture and are actively involved in the management and control of the business.

Signed at ……. on this ……. day of ……...20……..

……

Signature

I certify that the deponent has acknowledge that he/she knows and understands the contents of this declaration. This declaration has been sworn / affirmed before me at

…….. On this …… day of ……20……

…… ..... **STAMP:**

COMMISSIONER OF OATHS

I, THE UNDERSIGNED ……., ACTING IN MY CAPACITY AS

THE COMPANY/CORPORATION/BUSINESS VENTURE: …….

…….. Hereby gives Vaal Central Water and its delegates the right to inspect any documents in our possession pertaining to the verification of information reflecting the equity held in our company / corporation / business venture.

Signed at ……. on this ……. day of ……..20……..

……Signature

CONTRACT NO: VCW402/MCV/NFS/25

VOLUME 2 – FINANCIAL PROPOSAL

VAAL CENTRAL WATER

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

PROCUREMENT DOCUMENT

21 OCTOBER 2025

TENDER SUBMITTED BY:

Registered Name of Company: .....

Address: .....

Telephone Number: .....

Fax Number: .....

E-mail: .....

Issued by:
VAAL CENTRAL WATER
PO Box 30121
Pellissier
9322

ISSUE DATE: **21 October 2025**

BRIEFING SESSION: 20 October 2025 (Compulsory)

CLOSING DATE: 31 October 2025

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

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END OF SECTION

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

PART C1: AGREEMENTS AND CONTRACT DATA

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

AGREEMENTS AND CONTRACT DATA

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VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION C1.1: FORM OF OFFER AND ACCEPTANCE

FORM OF OFFER AND ACCEPTANCE OFFER

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

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

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

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

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS
Contract No: VCW402/MCV/NFS/25

…….

…… (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.

Signatures
Name(s)
Capacity

For the Tenderer……

Name and address of organisation:

Name & Signature of witness……Date…….

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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 T1	Tendering Procedures
Part T2	Returnable documents
Part C1	Agreements and Contract Data, (which includes this agreement)
Part C2	Pricing Data
Part C3	Scope of Work
Part C4	Drawings

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

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

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

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

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

Signatures

Name(s)

Capacity

.....

Name and address of organisation

Name & Signature of witness:.....Date:.....

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

SCHEDULE OF DEVIATIONS

Notes:

1. The extent of deviations from the Tender Document issued by the Employer prior to the Tender closing date is limited to those permitted in terms of the Conditions of Tender.
2. The Tenderer covering letter shall form part of the final Contract Document. Should any matter in such letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of Offer and Acceptance, the outcome of such agreement shall be recorded here.
3. Any other matter arising from the process of Offer and Acceptance either as a confirmation, clarification or change to the Tender Documents and which it is agreed by the Parties becomes an obligation of the Contract shall also be recorded here.
4. Any change or addition to the Tender Documents arising from the above agreements and recorded here shall also be incorporated into the final draft of the Contract.

1. **Subject** .....

   Details.....

2. **Subject** .....

   Details.....

3. **Subject** .....

   Details.....

4. **Subject** .....

   Details.....

5. **Subject** .....

   Details.....

6. **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 the amendments to the documents listed in the Tender Data and Addenda thereto as listed in the Tender Schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Tenderer and the Employer during this process of Offer and Acceptance.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

It is expressly agreed that no other matter whether, 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.

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION C1.2: CONTRACT DATA

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

CONTRACT DATA

GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract for Construction Works, 2nd Edition (2015), published by the South African Institution of Civil Engineering are applicable to this Contract.

The General Conditions of Contract are not bound into this document but are available at the Contractor's expense from the Secretary of the South African Institution of Civil Engineering, Private Bag X 200, Halfway House, Midrand, 1685.

CONTRACT DATA

In terms of clause 1.1.1.7 of the General Conditions of Contract for Construction Works 2nd Edition (2015), the following Contact Data apply to this Contract.

The Contract Data consists of two parts. Part 1 contains information provided by the Employer, while Part 2 contains information to be provided by the Contractor.

Part 1: Data Provided by the Employer

1.1.1.13	Defects Liability period shall be 12 months
1.1.1.14	The time to achieving Practical Completion should not exceed 18 months
1.1.1.15	The name of the Employer is Central Vaal Water Board
1.1.1.26	The Pricing Strategy is Re-measurement Contract
1.2.1.2	The address of the Employer is: Supply Chain Management Unit Vaal Central Water 2 Mzuzu Street Bloemfontein Free State 9301 Tel: +27(0) 51 403 0800 Fax: 051 – 422 5333 Email: bids@vcwater.co.za
1.1.1.16	The Employer's Agent is Henry Fagen Consulting Engineers & Projects
1.2.1.2	The contact details of the Employers are as follows: Henry Fagen Consulting Engineers & Projects Mr. P Van Der Merwe Regus Business Centre, Ground Floor, Unipark Building Vodacom Lane, Nobel Street, Bloemfontein 9301 Tel: +27 10 500 1486 Email: pietervdm@henryfagan.com

2.4.1	**Delete the contents of the clause and insert the following:** The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence, listed from highest to lowest priority: (a) Form of Offer and Acceptance (b) Contract Data (c) General Conditions of Contract (d) Drawings (e) Variations and Additional Clauses to Particular Specifications and Standard Specifications (f) Particular Specifications (g) Standard Specifications (h) Bill of Quantities (i) Service Level Agreement (j) Any other documents forming part of the Contract If an ambiguity or discrepancy between the documents is found, the Employer's Agent shall provide the necessary clarification or instruction.
3.2.3	The Employer's Agent shall obtain specific approval from the Employer before executing any of his functions or duties according to the following Clauses of the General Conditions of Contract: **1.** **New Clause 3.2.3.2** For expenditure on the Contract to exceed the Contract Sum **2.** **Existing Clauses:** 5.12 - Granting of extension of time excluding Clause 5.12.2.2 (Abnormal climatic conditions) 5.13 - Reduction of penalty for delay. 5.14.2 - The issue of a Certificate of Practical Completion. 5.14.4 - The issue of a Certificate of Completion. 5.16.1 - The issue of a Final Approval Certificate. 6.3 – All Variations 6.6 - Instruction to expend on Provisional and Prime Cost Sums 6.11 - Adjustment of General Items & Approval of Claims 8.2.2.2 - Order to repair and make good damage arising from any "excepted" risk.

3.2.4	The Employer's Agent has not been appointed as Agent in terms of Occupational Health and Safety on this contract. The Client will perform the duties of the Client, in terms of the Construction Regulations, 2014 as promulgated in terms of Section 43 of the Occupational Health and Safety Act, 1993.
4.3.1	**Add the following to the clause:** For construction works the Basic Conditions of Employment Act of 1997 (Act No 75 of 1997) shall apply and the minimum employment conditions which will apply shall be guided by the latest Sectorial Determination: Civil Engineering Sector published from time to time. Compliance with the National Environmental Management Act (NEMA), Act 107 of 1998. The Contractor shall comply with the Occupational Health and Safety Specification prepared by the Employer in terms of the Construction Regulations, 2014 promulgated in terms of Section 43 of the Occupational Health and Safety Act (Act No. 85 of 1993). Without limiting the Contractor's obligations in terms of the Contract, the Contractor shall before commencement of the Works or any part thereof, be in the possession of an approved Health and Safety Plan.
4.3.2	**Add the following to the clause:** Failure to provide such proof shall entitle the Employer to withhold any payment due to the Contractor until such proof is provided.
4.4.2	The Contractor shall submit the names of all subcontractors to the Employer's Agent for approval. Such approval shall not transfer any liabilities from the Contractor to any other party.
4.4.4	**Add the following to the clause:** The Employer shall require the Contractor to appoint subcontractors and local enterprises as per this clause called "LEP Subcontractors" to a minimum value of 30% of the final Contract Price (excludes VAT & CPA) by the Contractor. It is the Contractor's responsibility to ensure that this target is achieved, irrespective of any sums allowed for LEP work in the BoQ, which are only estimates. No additional mark-up or costs will be payable to the Contractor for this other than under the relevant items of the BoQ, the tendered rate which shall cover all costs including but not limited to management, administration, overheads, risk and profit for the work done under this clause.
4.10.2	The dates for the information to be provided will be communicated to the Contractor during the Site Handover Meeting. Late and/or incomplete information will be penalised at a rate of R 1,000.00 per day.

5.2.1	The commencement date shall be the date one week (7 calendar days) after the Confirmation of Receipt referred to in the form of Offer and Acceptance has been signed for by the Contractor.
5.3.1	**The documentation required before Commencement of the Works are:** Health and Safety Plan Approval (Refer to Clause 4.3) CV and Qualifications of Construction Manager Occupational Health and Safety Agreement (Refer to Clause 4.3) Initial Programme (Refer to Clause 5.6) Security (Refer to Clause 6.2) Proof of Insurance (Refer to Clause 8.6) Letter of Good Standing (Refer to Clause 4.3) BCCEI membership and good standing (Refer to Clause 4.3) Local Economic Participation Plan as per Returnable schedule T2.2.14 Project Quality Control Plan (Refer to Clause 7)
5.3.2	The Contractor is required, within 14 days of the Commencement Date, to submit the documents listed above in Clause 5.3.1 to the Employer's Agent for his approval. Health and Safety Plan The Contractor shall deliver his health and safety plan, in terms of Clause 5(1) of the Construction Regulations (2014). Initial Programme The Contractor shall deliver his Initial Programme of work in terms of Clause 5.6 Security Submit a guarantee of an Insurance Company or Bank to be jointly and severally bound with the Contractor for an amount equal to ten per cent (10%) of the Contract Price. The wording of the Guarantee shall be identical to the pro forma provided in Part C1.3 of this tender document. Insurance Submit copies of receipts of registration, or payment for the premiums for the following insurances, as required by the new Clause 8.6 in this Contact Data.
5.4.2	Access to and possession of the site shall not be exclusive to the Contractor insofar as the provisions of Clause 4.8 apply and where ongoing use by the general public is required. The Contractor shall bear all costs and charges for special and temporary rights of way required by him in connection with access to the site.

5.5	Due Completion Date is 6 months after the Commencement Date.
5.8.1	Delete the words "between sunset and sunrise" in the first line and replace with "outside normal working hours". Normal working hours shall be those as stated in the applicable Sectoral Determination applicable to a 5 (five) day week. Non-working days are Saturdays and Sundays, and special non-working days are public holidays and official builder's holidays as per the Sectoral Determination.
5.8.1.1	**Add the following to the clause:** The cost of supervision by the Employer's Agent or his representatives outside of normal (Monday to Friday) working hours in accordance with this Clause, shall be to the Contractor's account.
5.12.2.2	**Add the following to the clause:** The time period specified as the time for completion excludes allowances for those days on which it is expected that work, on the critical path items of the works, would be prevented due to weather conditions such as wind, rain falling or the subsequent waterlogged condition. • Allowance should be made for 3 days per month for Oct - Apr. • Allowance should be made for 1 day per month for May - Sept. If the Contractor has been prevented by these weather conditions from working on the critical path items of the works, then he must notify the Employer's Agent in writing. The notification shall be made within five calendar days of the resumption of work. The Employer's Agent shall upon considering all the relevant factors determine the extension of time to be granted. The tendered sums of the appropriate time-related items shall be increased to take account of the extensions of time granted.
5.12.5	**Add the following to the clause:** A delay in so far as extension of time is concerned, will be regarded as a delay only if, on a claim by the Contractor in accordance with the General Conditions of Contract, the Employer's Agent rules that all progress on an item or items of work on the critical path of the approved programme for the execution of the Works by the Contractor, has been brought to a halt. Delays on normal working days only, based on a working week, of five normal working days, will be taken in account for the extension of time.
5.13.1	The penalty for failing to complete the Works is R 15 000.00 per calendar day
5.14.1	The completion and acceptance of all works.
5.16.3	The latent defect period is 5 years.

6.2.1	Submit a guarantee of an Insurance Company or Bank to be jointly and severally bound with the Contractor for an amount equal to ten per cent (10%) of the Contract Sum. The wording of the Guarantee shall be identical to the pro forma provided in Section C1.3 of the Contract Data. A Retention Money Guarantee is not permitted.
6.2.2	**Delete Clause 6.2.2 in its entirety.**
6.2.3	The expiry date shall be the date, 30 calendar days after the programmed completion date.
6.5.1.2.3	The maximum percentage allowed to cover overhead charges is: Labour – 10% Materials – 10%
6.8.4	Notwithstanding the above, in the event that a public holiday is proclaimed within 28 days before the closing date for tenderers, no cost other than those that can be claimed under Clause 5.12.3 shall be added to the contract price.
6.9.1	**Add the following to the clause:** "The Contractor shall where practicable before delivery, and in any event not later than 24 hours after delivery to the Site, inform the Employer's Agent of any materials which are not his sole property."
6.10.1.5	The percentage advance on materials on site not yet built into the Permanent Works is 80%, and will only be paid once invoices, delivery slips, and proof of payments have been submitted with the IPC to the Employer's Agent as per this clause and Clause 6.10.2.
6.10.3	Retention monies held will be 10% (Excluding VAT) of payments due up to the limit of retention money which will be 5% of the Contract Sum (Excluding VAT).
6.10.4	Contractor's statement to include ALL relevant information, including calculation sheets and details as required by the Employer's Agent for evaluation. The "7-day period" will commence once ALL information and details have been received. **Replace** the wording "within 28 days" in Clause 6.10.4 with the wording "within 30 days".
6.10.6.2	**Delete this clause and replace with the following new wording:** No interest shall be payable to the Contractor upon any moneys retained or overdue in terms of the Contract.
6.10.8	**Replace** the wording "within 28 days" in Clause 6.10.8 with the wording "within 30 days".
6.10.9	**Replace** the wording "within 28 days" in Clause 6.10.9 with the wording "within 30 days".

7.2.1	**Add at the end of Clause 7.2.1**: "Unless otherwise directed in writing by the Employer's Agent, materials for the Permanent Works shall be new and unused."
7.8.1	In Clause 7.8.1, paragraph 2, line 2, after the words "Defects Liability Period", insert "within the period specified by the Employer's Agent",
8.1.2	The Contractor shall comply with The Environmental Management Programme (EMPr) and all conditions of applicable authorisations, licences and permits. All OHS and Environmental non-conformances / non-compliances based on the monthly audit reports shall be corrected within the period stated in the respective audit report and if not corrected the Contractor shall be liable for penalties as described below: • Non-conformances / non-compliances identified for the first time shall be corrected within the period stated in the respective audit report, and evidence provided to the relevant persons that corrective actions were implemented. • Should the same non-conformances / non-compliances be identified in a following audit (not necessarily consecutive), the Project Manager shall issue a notice of non-conformance / non-compliance to the Contractor, stating the nature and magnitude of the contravention with a copy be provided to the ECO / OHS Agent and it shall be corrected within 48 hours and evidence provided to the relevant persons that corrective actions were implemented. • Should the same non-conformances / non-compliances be identified in a subsequent audit (not necessarily consecutive) to the one mentioned above, it shall be considered an recurring non-conformance / non-compliance, and shall be corrected within 24 hours, as well as be penalised at R 2000.00 per finding, per day that it remains uncorrected and evidence shall be provided to the relevant persons that corrective actions were implemented as well as when they were implemented. • In the case of a non-compliance giving rise to physical damage or destruction of the environment, the ER shall be entitled to undertake such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so. • The ER shall at all times have the right to stop work and/or certain activities on site in the case of non-conformances / non-compliances or failure to implement remediation measures. • The Contractor will incur an immediate penalty of R 50,000.00 for the removal of or damage of any endangered plants or trees, if such removal occurs without written approval of the Employer's Agent. Note that if audited by DEA / DWS or other regulatory body, any first offence / non-conformances / non-compliances could attract prosecutions. Note that these are fines imposed by the Client, and that DEA / DWS or any other regulatory body may impose other fines as well as prosecutions.

8.6.1	The value of Plant and materials supplied by the Employer to be included in the insurance sum is R 0.00. The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is R 200 000.00. A Coupon Policy for Special Risks Insurance issued by the South African Special Risks Insurance Association (SASRIA) is required. The limit of indemnity for liability insurance is R 10 000 000.00 for any single claim, the number of claims to be unlimited during construction and Defects Liability Period. In addition to the insurances required in terms of General Conditions of Contract The following insurances are 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.
8.6.6	The insurance policies and proof of due payment shall be produced to the Employer's Agent within the time stated in Clause 5.3.2.
8.6.7	The Contractor may effect, at his own cost, any insurance additional to that effected by the Employer which he deems necessary in his own interests. The Employer reserves the right to call for full information regarding such insurances.

8.6.8	The insurances to be provided by the Contractor and Sub-Contractor shall be effected with Insurers and on terms approved by the Employer (which approval shall not be unreasonably withheld) and the Contractor shall, if required by the employer, produce to the employer the Policy or Policies of insurance and the receipts for payment of the current premiums. **Add Clause 8.6.8:** "In the event of any claim arising under the policies held in terms of this Clause, the Contractor shall forthwith take all necessary steps to lodge his claim on the joint behalf of himself and the Employer, and to secure settlement of such claim, and he shall submit to the Employer's Agent copies of all claims and associated documents. The claim submitted by the Contractor shall cover the cost of repairing and making good as required by Clauses 8.2.2.1 and 8.2.2.3.".
8.6.9	If the Contractor fails to effect and keep in force the insurances referred to, then the employer may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and, from time to time, deduct the amount paid by the Employer from any monies due or which may become due to the Contractor or recover same as a debt from the Contractor.
8.6.10	Where the Contractor is responsible for the appointment of Sub-Contractors, then the Contractor shall: (a) ensure that potential and appointed Sub-Contractors are aware of the whole content of this Special Conditions of Contract Clause; and (b) ensure the compliance of Sub-Contractors with this Special Conditions of Contract clause, where applicable.
8.6.11	The Contractor warrants that he shall give all notices and shall observe all the Terms and Conditions and requirements of all insurances applicable to this Contract.

9.1.4	**<u>Replace Clause 9.1.4 with the following:</u>** Up to the time of termination of the contract by either party in terms of this Clause, or until the Contractor gives notice in terms of this Clause to terminate the contract and the Contractor is precluded from exercising his right to terminate the contract because the Employer agrees to bear any resultant additional costs provided for in Clause 9.1.2.2 hereof, the Contractor: a) will be entitled to an extension of calendar time for working days lost as may be approved by the Employer's Agent, and b) will be reimbursed the cost of delays per working day, where the number of working days will be determined pro rata the effect the delays have on the progress of the work as agreed with the Employer's Agent. Payment in full and final settlement will be made at the rates tendered for the payment items specially provided in the Bill of Quantities Where the circumstances described in Clauses 9.1.1 and 9.1.2 are applicable only to a certain portion of the contract, the Employer's Agent will decide after consulting the Contractor, to what extent the contract as a whole is affected and whether or not a claim in terms of this Clause can be submitted. No payment will be made in terms of this Clause after the expiry of the due completion date.
10.3.2	Amicable settlement in terms of Clause 10.4 shall be contemplated for all disputes prior to referring any dispute to adjudication or arbitration.
10.5.1	Dispute resolution shall be by ad-hoc adjudication
10.5.3	The number of Adjudication Board Members to be appointed is one.
10.7.1	The determination of disputes which are unresolved in terms of Clause 10.5.3 shall be by arbitration.

CPA	PRELIMINARIES AND GENERAL ITEMS (P & G's) P & G's shall be divided as per the BoQ if so divided between Civil, Mechanical and Electrical, else it shall be pro rata divided based on the % of Civil/Mechanical/Electrical relevant to the month during which the certificate is submitted. CIVIL CONTRACT PRICE ADJUSTMENT Replace the definitions of "L"," P","M"," F" with the following: "L" is the "Labour Index" and shall be the "Geographic Index" (CPI per province) for the province in which the site lies, as stated in the Contract Data and as published in the Statistical News Release, P 0151.1, Table A of Statistics South Africa. "P" is the "Plant Index" and shall be the index for "Civil Engineering Plant" as published in the Statistical News Release P 0151.1, Table 4 of Statistics South Africa. "M" is the "Materials Index" and shall be the index for "Civil engineering material: (Excl bitumen)" as published in the Statistical News Release P 0142.1, Table 6 of Statistics South Africa. "F" is the "Fuel Index" and shall be the index for "Diesel fuel" as published in the Statistical News Release P 0142.1, Table 1 of Statistics South Africa. The base month is the month in which the tender enquiry closes plus the validity period. The following values for x, a, b, c and d shall apply: x = 0.15; a = 0.25; b = 0.25; c = 0.45; d = 0.05 MECHANICAL & ELECTRICAL CONTRACT PRICE ADJUSTMENT Adjustments to the Contract Price for the design, manufacture, painting, testing, supply, delivery, offloading and storage of Plant and Materials manufactured in the Republic of South Africa, shall be allowed only for variations in the cost of labour and material based on the indices published by the Steel and Engineering Industries Federation of South Africa (SEIFSA). The following SEIFSA tables shall be regarded as relevant to Mechanical and Electrical Works in this Contract: Table C3 Index of Actual labour cost Table G Statistics SA – production price index, Mechanical and Electrical Engineering Materials, as applicable Table Q (A) Index of stainless-steel flats products (excluding imports), Hot rolled steel Table N Ruling price of certain electrical cable manufacturing materials, Copper rod 7,90 mm Supply of Mechanical Plant and Materials

The amount of Contract Price Adjustment (CPA) will be as follows:

$$CPA = PT(1-x)\left[a\frac{(L_1-L_o)}{L_o} + b\frac{(M_1-M_o)}{M_o} + c\frac{(S_1-S_o)}{S_o}\right] \text{ where:}$$

PT = Contract sum for the supply of plant and equipment subject to escalation which sum shall exclude Value Added Tax

x = Portion of the original contract sum to be taken as fixed and therefore not subject to escalation

a = Percentage of contract sum to be taken as that portion that consists of Actual Labour cost

Lo = SEIFSA index of Actual Labour cost (all hourly paid employees) (Table C3) for the month during which tender enquiry closes plus the validity period

L1 = SEIFSA index of Actual Labour cost (all hourly paid employees) (Table C3) for the month during which delivery takes place as specified

b = Percentage of contract sum to be taken as that portion that consists of Mechanical Engineering materials

Mo = SEIFSA index for Mechanical Engineering materials (Table G) for the month during which tender enquiry closes plus the validity period

M1 = SEIFSA index for Mechanical Engineering materials (Table G) for the months during which delivery as specified takes place

c = Percentage of contract sum to be taken as that portion that consists of Stainless-Steel materials

So = SEIFSA index for Stainless Steel materials (Table Q–(A)) for the month during which tender enquiry closes plus the validity period

S1 = SEIFSA index for Stainless Steel materials (Table Q–(A)) for the month during which delivery as specified takes place

The following values for x, a, b and c shall apply:

x = 0.15; a = 0.45; b = 0.35; c = 0.20

Supply of Electrical Plants and Materials

The amount of Contract Price Adjustment (CPA) will be as follows:

$$CPA = PT(1 - X) \times \left[\frac{C \times (C1 - C0)}{C0} + \frac{M \times (M1 - M0)}{M0} + \frac{L \times (L1 - L0)}{L0}\right] \quad \text{where}$$

C = Proportion of Contract Price to which the SEIFSA Metal Prices Table F Copper shall apply

M = Proportion of Contract Price to which the SEIFSA Index Table G Electrical Engineering Material shall apply

L = Proportion of Contract Price to which the SEIFSA Index of Actual Labour cost Metal Prices Table C-3 shall apply

C0 = SEIFSA index of Copper Price Table F for the month during which the tender enquiry closes plus the validity period

C1 = SEIFSA index of Copper Price Table F for the month the month during which delivery as specified takes place

M0 = SEIFSA index of Table G Electrical Engineering Material for the month during which the tender enquiry closes plus the validity period

M1 = SEIFSA index of Table G Electrical Engineering Material for the month during which delivery as specified takes place

L0 = SEIFSA index of Actual Labour cost (all hourly paid employees) (Table C3) for the month during which the tender enquiry closes plus the validity period

L1 = SEIFSA index of Actual Labour cost (all hourly paid employees) (Table C3) for the month during which delivery as specified takes place

The following values for X, C, M and L shall apply:

X = 0.15 C = 0.20 M = 0.45 L = 0.35

C1.2.4 APPENDIX TO TENDER (continued)
(PART 2 - CONTRACT DATA PROVIDED BY THE CONTRACTOR)

Item	Clause	Entry
Contractor's Name	1.1.1.9	.....
Contractor's Address	1.2.1.2	....
Time for Completion (offered)	5.5.1	..... Months (subject to acceptance by Employer)

Signature .....

On behalf of .....

Date: .....

VAAL CENTRAL WATER

CONTRACT NO. VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

GUARANTEE FOR EXECUTION OF THE CONTRACT

Employer:	Vaal Central Water Office 2 Mzuzu Street Pellissier Bloemfontein	Contractor:	…….. …….. …….. …….. ……..

Amount of Guarantee: To be equal to 10 percent of the Tender Sum

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I/WE the undersigned, duly acting on behalf of the Company that is described below, do hereby bind the said Company to the Employer that is described above, as surety or co-principal debtor in solidum for the due performance, fulfilment and completion of the Contract by the Contractor that is described above, and we hereby undertake, on behalf of the Company to pay on demand at the above-mentioned address

- any loss or damage which the Employer may sustain
- as well as any penalties or claims and legal costs to which the Employer may become entitled by reason of the non-fulfilment or breach of the terms of the Contract by the Contractor

always provided that the liability of the Company under this guarantee shall not exceed the guaranteed amount that is described above.

On behalf of the Company, I/we do hereby renounce all benefits from the legal exceptions non numeratae pecuniae, non- causa debiti excussionis et divisionis and all other exceptions which might or could be pleaded against the validity of this guarantee, the meaning whereof we declare ourselves to be fully acquainted with.

On behalf of the Company, I/we do hereby agree that this guarantee shall be irrevocable and shall remain in full force and effect during the term of the Contract, either until the date of issue of a Certificate of Completion for the whole or the final portion of the Works by the Engineer, or until any liability of the Contractor which has arisen before such date in terms of the Conditions of Contract has been satisfied, whichever is the later.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

I/we do further agree and declare

- that all admissions and acknowledgements of indebtedness by the Contractor shall be binding on the Company,
- that the indebtedness of the Contractor to the Employer shall at all times be determined and proved by a written certificate of the Chief Executive Officer, or by any other person acting in such capacity,
- that such certificate shall be binding on the Company and shall be conclusive proof of the amount of the Company's indebtedness, and that such certificate annexed to this guarantee will be valid as a liquid document against the Company in a competent court in the Republic of South Africa,
- that the Employer shall, without reference and/or notice to us, have complete liberty of action to act in any manner authorised and/or contemplated by the terms of the Contract, and/or to agree to any modifications, variations or alterations to the Works, or to any extensions of the Due Completion Date for the Works under the Contract, and that the rights of the Employer under this guarantee shall in no way be prejudiced nor the liability of the Company be in any way reduced by reason of any steps or concessions which the Employer may take, make, give, concede or agree to under the Contract.
- that the Employer shall be entitled, without prejudice to any of its rights under this guarantee, to give time to and compound with release from liability or to make any other arrangement with the Contractor, its assigns, its liquidators or its judicial managers, and that any such actions shall not exonerate the Company from any portion of its liability under this guarantee.
- this guarantee is neither negotiable nor transferable, purports to the payment of money only and should be returned to the Company upon payment, completion or cancellation whichever occurs earlier.

Name of Company: _____

The Company chooses as its *domicilium citandi et executandi*, and for the purpose of the service of any notices and legal processes the following address:

Address to be entered _____

THUS DONE AND SIGNED AT_____on_____ 20_____.

On behalf of the Company _____

In his capacity as _____

On behalf of the Company _____

In his capacity as _____

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

In the presence of the following witnesses:

Witness No 1:

_____	_____
Name	Signature

Witness No 2:

_____	_____
Name	Signature

General Conditions of Contract

1. Definitions

1. The following terms shall be interpreted as indicated:

1.1 "Closing time" means the date and hour specified in the bidding documents for the receipt of bids.

1.2 "Contract" means the written agreement entered into between the purchaser and the supplier, as recorded in the contract form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

1.3 "Contract price" means the price payable to the supplier under the contract for the full and proper performance of his contractual obligations.

1.4 "Corrupt practice" means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.

1.5 "Countervailing duties" are imposed in cases where an enterprise abroad is subsidized by its government and encouraged to market its products internationally.

1.6 "Country of origin" means the place where the goods were mined, grown or produced or from which the services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.

1.7 "Day" means calendar day.

1.8 "Delivery" means delivery in compliance of the conditions of the contract or order.

1.9 "Delivery ex stock" means immediate delivery directly from stock actually on hand.

1.10 "Delivery into consignees store or to his site" means delivered and unloaded in the specified store or depot or on the specified site in compliance with the conditions of the contract or order, the supplier bearing all risks and charges involved until the supplies are so delivered and a valid receipt is obtained.

1.11 "Dumping" occurs when a private enterprise abroad market its goods on own initiative in the RSA at lower prices than that of the country of origin and which have the potential to harm the local industries in the RSA.

1.12 ” Force majeure” means an event beyond the control of the supplier and not involving the supplier’s fault or negligence and not foreseeable. Such events may include, but is not restricted to, acts of the purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

1.13 “Fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any bidder and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the bidder of the benefits of free and open competition.

1.14 “GCC” means the General Conditions of Contract.

1.15 “Goods” means all of the equipment, machinery, and/or other materials that the supplier is required to supply to the purchaser under the contract.

1.16 “Imported content” means that portion of the bidding price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or his subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs such as landing costs, dock dues, import duty, sales duty or other similar tax or duty at the South African place of entry as well as transportation and handling charges to the factory in the Republic where the supplies covered by the bid will be manufactured.

1.17 “Local content” means that portion of the bidding price which is not included in the imported content provided that local manufacture does take place.

1.18 “Manufacture” means the production of products in a factory using labour, materials, components and machinery and includes other related value-adding activities.

1.19 “Order” means an official written order issued for the supply of goods or works or the rendering of a service.

1.20 “Project site,” where applicable, means the place indicated in bidding documents.

1.21 “Purchaser” means the organization purchasing the goods.

1.22 “Republic” means the Republic of South Africa.

1.23 “SCC” means the Special Conditions of Contract.

1.24 "Services" means those functional services ancillaries to the supply of the goods, such as transportation and any other incidental services, such as installation, commissioning, provision of technical assistance, training, catering, gardening, security, maintenance and other such obligations of the supplier covered under the contract.

1.25 "Written" or "in writing" means handwritten in ink or any form of electronic or mechanical writing.

2. Application

2.1 These general conditions are applicable to all bids, contracts and orders including bids for functional and professional services, sales, hiring, letting a n d the granting or acquiring of rights, but excluding immovable property, unless otherwise indicated in the bidding documents.

2.2 Where applicable, special conditions of contract are also laid down to cover specific supplies, services or works.

2.3 Where such special conditions of contract are in conflict with these general conditions, the special conditions shall apply.

3. General

3.1 Unless otherwise indicated in the bidding documents, the purchaser shall not be liable for any expense incurred in the preparation and submission of a bid. Where applicable a non-refundable fee for documents may be charged.

3.2 With certain exceptions, invitations to bid are only published in the Government Tender Bulletin. The Government Tender Bulletin may be obtained directly from the Government Printer, Private Bag X 85, Pretoria 0001, or accessed electronically from www.treasury.gov.za

4. Standards

4.1 The goods supplied shall conform to the standards mentioned in the bidding documents and specifications.

5. Use of contract documents and information inspection

5.1 The supplier shall not, without the purchaser's prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the purchaser in connection therewith, to any person other than a person employed by the supplier in the performance of the contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

5.2 The supplier shall not, without the purchaser's prior written consent, make use of any document or information mentioned in GCC clause 5.1 except for purposes of performing the contract.

5.3 Any document, other than the contract itself mentioned in GCC clause 5.1 shall remain the property of the purchaser and shall be returned (all copies) to the purchaser on completion of the supplier's performance under the contract if so, required by the purchaser.

5.4 The supplier shall permit the purchaser to inspect the supplier's records relating to the performance of the supplier and to have them audited by auditors appointed by the purchaser, if so, required by the purchaser.

6. Patent rights

6.1 The supplier shall indemnify the purchaser against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the goods or any part thereof by the purchaser.

7. Performance security

7.1 Within thirty (30) days of receipt of the notification of contract award, the successful bidder shall furnish to the purchaser the performance security of the amount specified in SCC.

7.2 The proceeds of the performance security shall be payable to the purchaser as compensation for any loss resulting from the supplier's failure to complete his obligations under the contract.

7.3 The performance security shall be denominated in the currency of the contract, or in a freely convertible currency acceptable to the purchaser and shall be in one of the following forms:

(a) a bank guarantee or an irrevocable letter of credit issued by a reputable bank located in the purchaser's country or abroad, acceptable to the purchaser, in the form provided in the bidding documents or another form acceptable to the purchaser; or
(b) a cashier's or certified cheque

7.4 The performance security will be discharged by the purchaser and returned to the supplier not later than thirty (30) days following the date of completion of the supplier's performance obligations under the contract, including any warranty obligations, unless otherwise specified in SCC.

8. Inspections, tests and analyses

8.1 All pre-bidding testing will be for the account of the bidder.

8.2 If it is a bid condition that supplies to be produced or services to be rendered should at any stage during production or execution or on completion be subject to inspection, the premises of the bidder or contractor shall be open, at all reasonable hours, for inspection by a representative of the Department or an organization acting on behalf of the Department.

8.3 If there are no inspection requirements indicated in the bidding documents and no mention is made in the contract, but during the contract period it is decided that inspections shall be carried out, the purchaser shall itself make the necessary arrangements, including payment arrangements with the testing authority concerned.

8.4 If the inspections, tests and analyses referred to in clauses 7.5 show the supplies to be in accordance with the contract requirements, the cost of the inspections, tests and analyses shall be defrayed by the purchaser.

8.5 Where the supplies or services referred to in clauses 7.5 do not comply with the contract requirements, irrespective of whether such supplies or services are accepted or not, the cost in connection with these inspections, tests or analyses shall be defrayed by the supplier.

8.6 Supplies and services which are referred to in clauses 7.5 and which do not comply with the contract requirements may be rejected.

8.7 Any contract supplies may on or after delivery be inspected, tested or analyzed and may be rejected if found not to comply with the requirements of the contract. Such rejected supplies shall be held at the cost and risk of the supplier who shall, when called upon, remove them immediately at his own cost and forthwith substitute them with supplies which do comply with the requirements of the contract. Failing such removal the rejected supplies shall be returned at the suppliers cost and risk. Should the supplier fail to provide the substitute supplies forthwith, the purchaser may, without giving the supplier further opportunity to substitute the rejected supplies, purchase such supplies as may be necessary at the expense of the supplier.

8.8 The provisions of clauses 8.4 to 8.6 shall not prejudice the right of the purchaser to cancel the contract on account of a breach of the conditions thereof, or to act in terms of Clause 9.2 of GCC.

9. Packing

9.1 The supplier shall provide such packing of the goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing, case size and weights shall take into consideration, where appropriate, the remoteness of the goods' final destination and the absence of heavy handling facilities at all points in transit.

9.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract, including additional requirements, if any, specified in SCC, and in any subsequent instructions ordered by the purchaser.

10. Delivery and documents

10.1 Delivery of the goods shall be made by the supplier in accordance with the terms specified in the contract. The details of shipping and/or other documents to be furnished by the supplier are specified in SCC.

10.2 Documents to be submitted by the supplier are specified in SCC.

11. Insurance

11.1 The goods supplied under the contract shall be fully insured in a freely convertible currency against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified in the SCC.

12. Transportation

12.1 Should a price other than an all-inclusive delivered price be required, this shall be specified in the SCC.

13. Incidental services

13.1 The supplier may be required to provide any or all of the following services, including additional services, if any, specified in SCC:

(a) performance or supervision of on-site assembly and/or commissioning of the supplied goods.
(b) furnishing of tools required for assembly and/or maintenance of the supplied goods.
(c) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied goods.
(d) performance or supervision or maintenance and/or repair of the supplied goods, for a period of time agreed by the parties, provided that this service shall not relieve the supplier of any warranty obligations under this contract; and
(e) training of the purchaser's personnel, at the supplier's plant and/or on site, in assembly, start-up, operation, maintenance, and/or repair of the supplied goods.

13.2 Prices charged by the supplier for incidental services, if not included in the contract price for the goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the supplier for similar services.

14. Spare parts

14.1 As specified in SCC, the supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the supplier:

(a) such spare parts as the purchaser may elect to purchase from the supplier, provided that this election shall not relieve the supplier of any warranty obligations under the contract; and
(b) in the event of termination of production of the spare parts:
(i) Advance notification to the purchaser of the pending termination, in sufficient time to permit the purchaser to procure needed requirements; and
(ii) following such termination, furnishing at no cost to the purchaser, the blueprints, drawings, and specifications of the spare parts, if requested.

15. Warrant

15.1 The supplier warrants that the goods supplied under the contract are new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the contract. The supplier further warrants that all goods supplied under this contract shall have no defect, arising from design, materials, or workmanship (except when the design and/or material is required by the purchaser's specifications) or from any act or omission of the supplier, that may develop under normal use of the supplied goods in the conditions prevailing in the country of final destination.

15.2 This warranty shall remain valid for twelve (12) months after the goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the contract, or for eighteen (18) months after the date of shipment from the port or place of loading in the source country, whichever period concludes earlier, unless specified otherwise in SCC.

15.3 The purchaser shall promptly notify the supplier in writing of any claims arising under this warranty.

15.4 Upon receipt of such notice, the supplier shall, within the period specified in SCC and with all reasonable speed, repair or replace the defective goods or parts thereof, without costs to the purchaser.

15.5 If the supplier, having been notified, fails to remedy the defect(s) within the period specified in SCC, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expense and without prejudice to any other rights which the purchaser may have against the supplier under the contract

16. Payment

16.1 The method and conditions of payment to be made to the supplier under this contract shall be specified in SCC.

16.2 The supplier shall furnish the purchaser with an invoice accompanied by a copy of the delivery note and upon fulfilment of other obligations stipulated in the contract.

16.3 Payments shall be made promptly by the purchaser, but in no case later than thirty (30) days after submission of an invoice or claim by the supplier.

16.4 Payment will be made in Rand unless otherwise stipulated in SCC.

17. Prices

17.1 Prices charged by the supplier for goods delivered and services performed under the contract shall not vary from the prices quoted by the supplier in his bid, with the exception of any price adjustments authorized in SCC or in the purchaser's request for bid validity extension, as the case may be.

18. Contract amendments

18.1 No variation in or modification of the terms of the contract shall be made except by written amendment signed by the parties concerned.

19. Assignment

19.1 The supplier shall not assign, in whole or in part, its obligations to perform under the contract, except with the purchaser's prior written consent.

20. Subcontracts

20.1 The supplier shall notify the purchaser in writing of all subcontracts awarded under this contract if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the supplier from any liability or obligation under the contract.

21. Delays in the supplier's performance

21.1 Delivery of the goods and performance of services shall be made by the supplier in accordance with the time schedule prescribed by the purchaser in the contract.

21.2 If at any time during performance of the contract, the supplier or its subcontractor(s) should encounter conditions impeding timely delivery of the goods and performance of services, the supplier shall promptly notify the purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the supplier's notice, the purchaser shall evaluate the situation and may at his discretion extend the supplier's time for performance, with or without the imposition of penalties, in which case the extension shall be ratified by the parties by amendment of contract.

21.3 No provision in a contract shall be deemed to prohibit the obtaining of supplies or services from a national department, provincial department, or a local authority.

21.4 The right is reserved to procure outside of the contract small quantities or to have minor essential services executed if an emergency arises, the supplier's point of supply is not situated at or near the place where the supplies are required, or the supplier's services are not readily available.

21.5 Except as provided under GCC Clause 7.5.4, a delay by the supplier in the performance of its delivery obligations shall render the supplier liable to the imposition of penalties, pursuant to GCC Clause 5.13, unless an extension of time is agreed upon pursuant to GCC Clause 5.12 without the application of penalties.

21.6 Upon any delay beyond the delivery period in the case of a supplies contract, the purchaser shall, without cancelling the contract, be entitled to purchase supplies of a similar quality and up to the same quantity in substitution of the goods not supplied in conformity with the contract and to return any goods delivered later at the supplier's expense and risk, or to cancel the contract and buy such goods as may be required to complete the contract and without prejudice to his other rights, be entitled to claim damages from the supplier.

22. Penalties

22.1 Subject to GCC Clause 5.5.1, if the supplier fails to deliver any or all of the goods or to perform the services within the period(s) specified in the contract, the purchaser shall, without prejudice to its other remedies under the contract, deduct from the contract price, as a penalty, a sum calculated on the delivered price of the delayed goods or unperformed services using the current prime interest rate calculated for each day of the delay until actual delivery or performance. The purchaser may also consider termination of the contract pursuant to GCC Clause 9.2.

23. Termination for default

23.1 The purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the supplier, may terminate this contract in whole or in part:

(a) if the supplier fails to deliver any or all of the goods within the period(s) specified in the contract, or within any extension thereof granted by the purchaser pursuant to GCC Clause 9.2;
(b) if the Supplier fails to perform any other obligation(s) under the contract; or
(c) if the supplier, in the judgment of the purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the contract.

23.2 In the event the purchaser terminates the contract in whole or in part, the purchaser may procure, upon such terms and in such manner as it deems appropriate, goods, works or services similar to those undelivered, and the supplier shall be liable to the purchaser for any excess costs for such similar goods, works or services. However, the supplier shall continue performance of the contract to the extent not terminated.

23.3 Where the purchaser terminates the contract in whole or in part, the purchaser may decide to impose a restriction penalty on the supplier by prohibiting such supplier from doing business with the public sector for a period not exceeding 10 years.

23.4 If a purchaser intends imposing a restriction on a supplier or any person associated with the supplier, the supplier will be allowed a time period of not more than fourteen (14) days to provide reasons why the envisaged restriction should not be imposed. Should the supplier fail to respond within the stipulated fourteen (14) days the purchaser may regard the intended penalty as not objected against and may impose it on the supplier.

23.5 Any restriction imposed on any person by the Accounting Officer /Authority will, at the discretion of the Accounting Officer/Authority, also be applicable to any other enterprise or any partner, manager, director or other person who wholly or partly exercises or exercised or may exercise control over the enterprise of the first-mentioned person, and with which enterprise or person the first-mentioned person, is or was in the opinion of the Accounting Officer/Authority actively associated.

23.6 If a restriction is imposed, the purchaser must, within five (5) working days of such imposition, furnish the National Treasury, with the following information:

(i) the name and address of the supplier and / or person restricted by the purchaser;
(ii) the date of commencement of the restriction
(iii) the period of restriction; and
(iv) the reasons for the restriction.

These details will be loaded in the National Treasury's central database of suppliers or persons prohibited from doing business with the public sector.

23.7 If a court of law convicts a person of an offence as contemplated in sections 12 or 13 of the Prevention and Combating of Corrupt Activities Act, No. 12 of 2004, the court may also rule that such person's name be endorsed on the Register for Tender Defaulters. When a person's name has been endorsed on the Register, the person will be prohibited from doing business with the public sector for a period not less than five years and not more than 10 years. The National Treasury is empowered to determine the period of restriction, and each case will be dealt with on its own merits. According to section 32 of the Act the Register must be open to the public. The Register can be perused on the National Treasury website.

24. Anti-dumping and countervailing duties and rights

24.1 When, after the date of bid, provisional payments are required, or anti- dumping or countervailing duties are imposed, or the amount of a provisional payment or anti-dumping or countervailing right is increased in respect of any dumped or subsidized import, the State is not liable for any amount so required or imposed, or for the amount of any such increase. When, after the said date, such a provisional payment is no longer required or any such anti-dumping or countervailing right is abolished, or where the amount of such provisional payment or any such right is reduced, any such favourable difference shall on demand be paid forthwith by the contractor to the State or the State may deduct such amounts from moneys (if any) which may otherwise be due to the contractor in regard to supplies or services which he delivered or rendered, or is to deliver or render in terms of the contract or any other contract or any other amount which may be due to him

25. Force Majeure

25.1 Notwithstanding the provisions of GCC Clauses 6.2 and 9.2, the supplier shall not be liable for forfeiture of its performance security, damages, or termination for default if and to the extent that his delay in performance or other failure to perform his obligations under the contract is the result of an event of force majeure.

25.2 If a force majeure situation arises, the supplier shall promptly notify the purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the purchaser in writing, the supplier shall continue to perform its obligations under the contract as far as is reasonably practical and shall seek all reasonable alternative means for performance not prevented by the force majeure event.

26. Termination for insolvency

26.1 The purchaser may at any time terminate the contract by giving written notice to the supplier if the supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the supplier, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the purchaser.

27. Settlement of Disputes

27.1 If any dispute or difference of any kind whatsoever arises between the purchaser and the supplier in connection with or arising out of the contract, the parties shall make every effort to resolve amicably such dispute or difference by mutual consultation.

27.2 If, after thirty (30) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the purchaser or the supplier may give notice to the other party of his intention to commence with mediation. No mediation in respect of this matter may be commenced unless such notice is given to the other party.

27.3 Should it not be possible to settle a dispute by means of mediation, it may be settled in a South African court of law.

27.4 Mediation proceedings shall be conducted in accordance with the rules of procedure specified in the SCC.

27.5 Notwithstanding any reference to mediation and/or court proceedings herein,

(a) the parties shall continue to perform their respective obligations under the contract unless they otherwise agree; and
(b) the purchaser shall pay the supplier any monies due the supplier.

28. Limitation of liability

28.1 Except in cases of criminal negligence or wilful misconduct, and in the case of infringement pursuant to Clause 7.8;

(a) the supplier shall not be liable to the purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the supplier to pay penalties and/or damages to the purchaser; and

(b) the aggregate liability of the supplier to the purchaser, whether under the contract, in tort or otherwise, shall not exceed the total contract price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.

29. Governing language

29.1 The contract shall be written in English. All correspondence and other documents pertaining to the contract that is exchanged by the parties shall also be written in English.

30. Applicable law

30.1 The contract shall be interpreted in accordance with South African laws, unless otherwise specified in SCC.

31. Notices

31.1 Every written acceptance of a bid shall be posted to the supplier concerned by registered or certified mail and any other notice to him shall be posted by ordinary mail to the address furnished in his bid or to the address notified later by him in writing and such posting shall be deemed to be proper service of such notice

31.2 The time mentioned in the contract documents for performing any act after such aforesaid notice has been given, shall be reckoned from the date of posting of such notice.

32. Taxes and duties

32.1 A foreign supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the purchaser's country.

32.2 A local supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted goods to the purchaser.

32.3 No contract shall be concluded with any bidder whose tax matters are not in order. Prior to the award of a bid the Department must be in possession of a tax clearance certificate, submitted by the bidder. This certificate must be an original issued by the South African Revenue Services.

33. National Industrial Participation (NIP) Programme

33.1 The NIP Programme administered by the Department of Trade and Industry shall be applicable to all contracts that are subject to the NIP obligation.

VAAL CENTRAL WATER

CONTRACT NO. VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

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INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

Annexure C: Health and Safety Specification by Employer

1. INTRODUCTION

1.1 Purpose and Scope

This document describes the requirements of compliance to which the PRINCIPAL CONTRACTOR/CONTRACTOR is to adhere in relation to the scope of works.

This document defines the minimum management requirement that is to be implemented by the PRINCIPAL CONTRACTOR/CONTRACTOR for the management of Health and Safety on the project.

The aim of this document is to present the safety aspects that need to be controlled and managed on the project.

2. REFERENCE DOCUMENTS

- Occupational Health and Safety Act, (Act No. 85 of 1993)
- Compensation for Occupational Injury and Diseases Act.
- Client Health and Safety Specification.
- Construction Regulations 2003.
- The Construction Kit. (CD)

3. DEFINITIONS

The following definitions will apply to the Safety Management Plan, acronyms given hereunder shall apply:

3.1 Construction / Building Work (as defined by the Occupational Health and Safety Act: Construction Regulations 2003):

Means any work in connection with –

a) The erection, maintenance, alteration, renovation, repair, demolition or dismantling of or an addition to a building or any similar structure;
b) The installation, erection, dismantling or maintenance of a fixed plant where such work includes the risk of a person falling;
c) The construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or
d) The moving of earth, clearing of land or making of an excavation or work on any similar type of work.

3.2 Hazard Identification and Risk Assessment and Risk Control (HRA)

Means a documented plan, which identifies hazards, assesses the risks and detailing the control measures and safe working procedures, which are to be used to mitigate and control the occurrence of hazards and risks during construction or operation phases.

3.3 Site

Means the area in the possession of the PRINCIPAL CONTRACTOR/CONTRACTOR for the construction of the works. Where there is no demarcated boundary it will include all adjacent areas, which are reasonably required for the activities for the PRINCIPAL CONTRACTOR/CONTRACTOR and approved for such use by the Engineer and/or client.

3.4 The Act

Means, unless the context indicates otherwise, the Occupational Health and Safety Act, 1993 (ACT NO. 85 of 1993) and Regulations promulgated there under. (OHSA)

3.5 Hazard

Means a source of or exposure to danger (source which may cause injury or damage to persons, or property)

3.6 Risk

Means the probability or likelihood that a hazard can result in injury or damage.

3.7 Principal Contractor/Contractor's – Responsible Person/s

Means any person appointed in writing by the PRINCIPAL CONTRACTOR/CONTRACTOR to supervise construction or building work. The appointment shall be as required by the OHSA which shall stipulate health and safety responsibilities, area of responsibility and the proposed duration of the project.

3.8 Hazardous Chemical Substance (HCS)

Means any toxic, harmful, corrosive, irritant or asphyxiant substance, or a mixture or substances for which an occupational exposure limit is prescribed, or an occupational exposure limit is not prescribed, but which creates a hazard to health.

3.9 Construction Plant (TEM)

Encompasses all types of plant including but not limiting to, cranes, piling frames, boring machines, excavators, dewatering equipment and road vehicles with or without lifting equipment.

3.10 Contractor

Means "subcontractor".

3.11 Health and Safety Program

Encompasses the PRINCIPAL CONTRACTOR/CONTRACTOR safety planning spreadsheet.

3.12 Health and Safety Plan (HSP)

The content of this document which will be made available on site for inspection by an inspector, Technical Officer, Agent, subcontractor, employee, registered employee organisation, health and safety representative, or member of the health and safety committee.

3.13 Health and Safety File

Describes the safety file holding all records on health and safety for the project, which shall be available at all, times for evaluation, and copy of which will be forwarded to the client upon completion of the project.

4. RESPONSIBILITIES

4.1 Notification of Intention to Commence Construction Work

It is essential for the PRINCIPAL CONTRACTOR/CONTRACTOR to notify the Provincial Director of the Department of Labour, immediately upon receipt of the Letter of Acceptance of project commencement in accordance with the following requirements:

- The demolition of a structure exceeding a height of 3 meters; or
- The use of explosives to perform construction work; or
- The dismantling of fixed plant at a height greater than 3 meters; or
- The work exceeds 30 days or will involve more than 300 person days of construction work; and

- Includes excavation work deeper than 1 meter; or
- Includes working at a height greater than 3 meters above ground or a landing.

A copy of the notification letter to the Provincial Director must be forwarded to the CLIENT for the CLIENTS records.

4.2 Assignment of PRINCIPAL CONTRACTOR/CONTRACTORS Responsible Persons to Supervise Health and Safety on Site

The PRINCIPAL CONTRACTOR/CONTRACTOR shall appoint in writing a Contracts Manager and a Construction Work Supervisor as a minimum prior to commencing work on site and copies of all the appointment letters of the responsible persons shall be forwarded to the CLIENT prior commencement of work on site.

4.3 Safety Officer Appointment

The appointment of a full-time safety officer is optional; however, it is compulsory to provide the name and CV of your elected part-time safety officer to the CLIENT prior work commencing on site. The safety officers shall be tasked with monthly inspections of the site, the results of which shall be forwarded to the CLIENT or his appointed representative.

4.4 Risk Assessment Competent Person

The PRINCIPAL CONTRACTOR/CONTRACTOR shall appoint a competent person in writing at commencement of the project to control the risk assessment process on site.

4.5 Competency for PRINCIPAL CONTRACTOR/CONTRACTORS Responsible Persons

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that all management personnel (responsible for health and safety) shall undergo a half-day Health and Safety Management Course, which is to be arranged and conducted by the CLIENT prior to commencement of activities on site.

4.6 Health and Safety Plan

The PRINCIPAL CONTRACTOR/CONTRACTOR shall provide to the CLIENT, a Health and Safety Plan in accordance with this Specification. The Health and Safety Plan shall be submitted for approval to the CLIENT before work commences on site.

4.7 Health and Safety Representatives

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure at least one (1) Health and Safety Representative be nominated, elected and trained to carry out his / her functions in his / her area of responsibility. This shall also be required in areas where less than fifty (50) employees are engaged in activity. The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure employees elected shall be designated in writing for a specific area and period of time.

The designated persons shall be required to conduct monthly inspections within their area of responsibility, the records must be kept for CLIENT auditing purposes and that deviations recorded are reported to the responsible supervisor within the designated persons area so that appropriate action can be taken.

The designated person/s shall be permitted to participate in the Joint Health and Safety Committee Meetings.

5. OBJECTIVES AND TARGETS

The PRINCIPAL CONTRACTOR/CONTRACTOR shall include in the Health and Safety Plan the PRINCIPAL CONTRACTOR/CONTRACTORS objectives and targets for the project.

5.1 Planning and Procedures

The PRINCIPAL CONTRACTOR/CONTRACTOR shall define in the Health and Safety Plan, the method of planning to be used on the project and the procedures to be adhered to. The PRINCIPAL CONTRACTOR/CONTRACTOR shall be required to utilise the NOSA Construction Kit as as minimum on the Project.

6. IMPLEMENTATION OF THE OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

The PRINCIPAL CONTRACTOR / CONTRACTOR shall ensure that the CLIENT Health and Safety Specification is implemented on the project through the PRINCIPAL CONTRACTOR/CONTRACTORS Health and Safety Plan which must be submitted to the CLIENT for approval prior work commencing on site.

7. APPLICATION OF THE HEALTH AND SAFETY SPECIFICATION

7.1 Compensation of Occupational Injuries and Diseases Act, Act No. 130 of 1993 (COIDA)

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure a letter of good standing will be provided to the CLIENT prior to work commencing on site for reference purposes as proof of good standing.

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure all other PRINCIPAL CONTRACTOR/CONTRACTORS appointed also comply with the above requirements defined in the COIDA.

7.2 Occupational Health and Safety Policy

The PRINCIPAL CONTRACTOR/CONTRACTOR Health and Safety Policy is to be attached to the Health and Safety Plan for review by the CLIENT.

7.3 Hazard Identification Risk Assessment (HIRA)

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that Hazard Identification Risk Assessment forms the basis of all work to be conducted on site, and a Task Risk Assessment be submitted for approval to the CLIENT prior to work commencing on site. The CLIENT shall provide a copy of the Task Risk Assessment, or the format provided on the NOSA Construction Kit CD.

All Risk Assessments conducted on site must be forwarded to the CLIENT for approval.

The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure that training forms part of the HIRA process and proof of training attendance is made available to the CLIENT upon request.

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure a HIRA team be established comprising members as follows, but not limited to:

- Health and Safety Representative(s).
- Health and Safety Committee Member(s).
- Management Representative/PRINCIPAL CONTRACTOR/CONTRACTOR.
- Person with skill/knowledge of task to be performed.

Method Statements and Safe Work Procedures must form part of the HIRA Process and must be conducted in conjunction with the HIRA Process described above.

7.4 Health and Safety Committee

The PRINCIPAL CONTRACTOR/CONTRACTOR shall convene a health and safety committee meeting monthly. All members required to be in attendance shall be notified of such meeting by means of a formal agenda which must be made available to the CLIENT upon request.

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure an attendance register and minutes are kept for auditing purposes by the CLIENT. A copy of all minutes must be forwarded to the CLIENT monthly.

7.5 Health and Safety Training

Training of personnel is a legal requirement and a necessity and is required of the PRINCIPAL CONTRACTOR/CONTRACTOR to provide to the CLIENT a training Matrix which must be included in the Health and Safety Plan to be submitted prior work commencing on site. Training should include the following but is not limited to:

7.5.1 Induction Training

Induction training must be attended by all PRINCIPAL CONTRACTOR/CONTRACTOR with the CLIENT which shall be separate to the PRINCIPAL CONTRACTOR/CONTRACTOR own induction training requirement. The PRINCIPAL CONTRACTOR/CONTRACTOR must keep records of all attendees to the induction and provide records of the same during the CLIENT site audits.

7.5.2 Awareness Training (Toolbox Talks)

Weekly awareness training must be conducted and records of these must be made available to the
CLIENT upon request.

7.5.3 Competency

Training identified through the HIRA Process and conducted through this process shall be kept on file as proof of competency and training and must be made available to the CLIENT upon request. (This shall include operator accordance training and assessments)

7.5.4 First Aid and Health & Safety Representative Training

PRINCIPAL CONTRACTOR/CONTRACTOR shall provide proof of competency of all Health and Safety Representatives elected and designated, including first aiders to the CLIENT, which must be available on site for auditing purposes.

7.6 General Record Keeping

The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure that all the Health and Safety records, required by both the Occupational Health and Safety Act, 85 of 1993 and Regulations are kept for reference purposes and auditing by the CLIENT.

Further to the requirements set out above, the PRINCIPAL CONTRACTOR/CONTRACTOR must also maintain records that may be defined through the risk assessment process, for auditing purposes.

In accordance with the requirements set out in the Construction Regulations 2003 and the requirement set out in the CLIENT Specification the PRINCIPAL CONTRACTOR/CONTRACTOR must ensure a copy of all Health and Safety records generated during the course of construction, are handed over to the CLIENT upon completion of construction.

7.6.1 Statistics

The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure injury and incident records (Near Hits, First Aid, Medical cases, Disabling Lost Time Incidents), training etc. referred to above are kept on site and submitted monthly to the CLIENT. All documents shall be made available to the CLIENT for inspection including the Department of Labour's Inspectors as required by the Occupational Health and Safety Act, 85 of 1993.
The statistics formula as listed below shall be adhered to during construction: DIFR (Disabling Injury Frequency Rate) $\frac{\text{DI's x 1 000 000}}{\text{Man-hours}}$

DISR (Disabling Injury Severity Rate) $\frac{\text{Days Lost x 1 000}}{\text{Man-hours}}$

7.6.2 General Inspection, Monitoring and Reporting

The PRINCIPAL CONTRACTOR/CONTRACTOR shall comply with the requirements set out by the CLIENT. The PRINCIPAL CONTRACTOR/CONTRACTOR must provide to the CLIENT a safety management action plan upon which the dates of inspections and training and awareness will be entered, conducted and monitored.

The PRINCIPAL CONTRACTOR/CONTRACTOR shall keep all records of inspections and investigations undertaken during the contract for the specified legal period as defined in the OHSA and Regulations.

7.6.3 Internal Audits

Internal audits shall be conducted a minimum once per month by the CLIENT or client's appointed Safety Manager/Officer.

The Results shall be tabled and discussed at the Joint Health and Safety Committee meetings.

The PRINCIPAL CONTRACTOR/CONTRACTOR must also conduct its own internal audits, the results of which must be submitted to the CLIENT monthly.

7.7 Incentives

Incentive schemes are left to the discretion of the PRINCIPAL CONTRACTOR/CONTRACTOR.

7.8 Penalties

Non-compliance with the CLIENT safety specifications will result in work stoppages and possible expulsion from site until the problem has been remedied. Costs will be borne by the PRINCIPAL CONTRACTOR/CONTRACTOR.

7.9 Emergency Procedures

The PRINCIPAL CONTRACTOR/CONTRACTOR must make available to the CLIENT a detailed Emergency Plan to tie into the evacuation plan already in place on the CLIENTS premises.

7.9.1 First Aid Box and Contents

The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure that all working areas are adequately provided with first aid attendants whether there are fifty (50) employees or less engaged on the contract. The First Aid attendant must be trained in accordance with the requirements set out in the OHSA with a recognised and accredited service provider as defined above.

The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure that the first aid box is adequately at all times and is accessible to all.

The CLIENT shall inspect the contents of the first aid box and dressing record from time to time.

7.9.2 Accident and Incident Reporting and Investigation

Should an accident or incident occur, the PRINCIPAL CONTRACTOR/CONTRACTOR shall conduct an investigation into the incident. The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure that a competent person be appointed in writing to conduct the said investigation. The procedure to be followed must be in accordance with the OHSA requirement on the Annexure 1 – Recording and Investigation of Incident form.

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that the results of all investigations are communicated to the employees engaged through incident recall and prescribed meetings. The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure that the investigations are kept for record purposes in accordance with the prescribed requirements set out in the OHSA.

Should there be an incident, the CLIENT must be notified within 24-hours of the occurrence. The CLIENT reserves the right to participate in all investigations into accidents or incidents.

7.10 Hazards and Potentially Hazardous Situations

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that all other PRINCIPAL CONTRACTOR/CONTRACTOR are warned of hazardous or potentially hazardous situations, which may prevent them from effectively performing their duties, which includes the placement of adequate warning signs.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

7.11 Personal Protective Equipment and Clothing

The PRINCIPAL CONTRACTOR/CONTRACTOR shall comply with OHSA requirements to provide PPE.

The PRINCIPAL CONTRACTOR/CONTRACTOR shall through the HIRA process identify the specific PPE needs per activity and then issue the PPE accordingly. (Reference to the OHSA General Safety Regulation 2 – Employer to provide Personal Protective Equipment).

Should PPE be lost or stolen, then the employee will be issued with a new set of PPE by the PRINCIPAL CONTRACTOR/CONTRACTOR.

The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure adequate training in the use of PPE is provided to all employees, and proof of training shall be kept at the office for auditing purposes.

Overalls and hardhats shall be identifiable. (PRINCIPAL CONTRACTOR/CONTRACTOR different from the PRINCIPAL CONTRACTOR/CONTRACTOR).

PPE must be provided to visitors as well.

7.12 Safety Signage

The PRINCIPAL CONTRACTOR/CONTRACTOR must assess the Health and Safety Signage requirements in conjunction with the HIRA's conducted and place the signage at strategic positions on the site works accordingly.

The PRINCIPAL CONTRACTOR/CONTRACTOR shall also maintain the signage to ensure its effectiveness at all times and under all conditions. Signage, which cannot be repaired, must be replaced.

7.13 Permits

- The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that access to site works is restricted to construction personnel.
- All attempts must be made to restrict spectator access.
- Access to the site shall be by the CLIENTS authorisation on the prescribed form. (Permits and ID cards shall be issued by the client)
- Special permits for hot work and isolation permits shall be applied for to the CLIENT representative prior to commencing with the activity.

7.14 Contractors and Suppliers

The PRINCIPAL CONTRACTOR shall enter into an Agreement with Mandatory in terms of Section 37(2) of the Occupational Health and Safety Act, 85 of 1993, with the CLIENT and all other CONTRACTORS appointed by the PRINCIPAL CONTRACTOR.

The PRINCIPAL CONTRACTOR/CONTRACTOR shall also be required to appoint its CONTRACTORS in accordance with Construction Regulation 5(3)(b).

The PRINCIPAL CONTRACTOR must ensure all other CONTRACTORS are issued with the CLIENT Safety Specification where reasonably practicable. The PRINCIPAL CONTRACTOR shall assist and ensure CONTRACTORS engaged comply with all of these requirements and adhere to the requirements set out in the OHSA.

PRINCIPAL CONTRACTOR/CONTRACTOR will be stopped from working in the event of unsafe conditions and activities being observed.

8. HEALTH AND SAFETY IN PRACTICE

8.1 Excavations

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that all activities involving excavations, shoring, dewatering or drainage, a safe working procedure is submitted to the project engineer for approval prior to work commencing. Excavation work exceeding the specified depth as stipulated in the OHSA regulations, must comply with the following requirements:

a) The excavations are inspected before the shift starts, after heavy rain (inclement weather) and after any major condition which may affect the excavations stability and the findings are to be recorded and kept;
b) All excavations regardless of the depth shall be adequately barricaded to prevent persons falling into the excavation;
c) The safe working procedure shall be communicated to all employees who may be effected by the work; and
d) The safe working procedures shall be enforced and maintained by the appointed excavation supervisor at all times.
e) For high-risk activities, all personnel working in the excavation shall be attached by means of a lifeline.
f) Material excavated shall be removed from the point of excavation.
g) Ensure stability of adjoining structures.

The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure that a competent person be appointed in writing to control all excavating activities during construction.

8.2 Demolition

The PRINCIPAL CONTRACTOR/CONTRACTOR must appoint a competent person in writing to supervise and control all demolition work on site.

The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure that prior to any demolition work being carried out, and in order also to ascertain the method of demolition to be used, a detailed structural engineering survey of the structure to be demolished is carried out by a competent person and that a method statement on the procedure to be followed in demolishing the structure is developed and provided to the CLIENT on request.

During the demolition, the competent person shall check the structural integrity of the structure at regular intervals determined in the method statement. In order to avoid any premature collapses.

It is important for the PRINCIPAL CONTRACTOR/CONTRACTOR to ensure compliance against the requirements of the Construction Regulation 12, as the CLIENT shall conduct ad hoc inspections to test for compliance.

8.3 Explosives and Blasting

The PRINCIPAL CONTRACTOR shall ensure where blasting is required with the use of explosives, that compliance with the Explosives Regulations.
The PRINCIPAL CONTRACTOR must ensure that all work carried out in under the supervision of a competent person as defined in the Explosives Regulations which requires the competent person to have sufficient training and experience in, and knowledge of, the health and safety aspects of explosives deemed appropriate

by the National Explosives Council or any other organization approved by the chief inspector of occupational health and safety.

The PRINCIPAL CONTRACTOR must ensure a detailed blasting plan, emergency plan and site layout plan is submitted for approval to the CLIENT.

8.4 Stacking of Materials and Housekeeping

The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure that all stacking will be supervised by a person competent and appointed in writing to supervise over the activities, and that clearly defined and allocated storage areas are provided for and identified, and that materials being stored within this area are stacked in accordance with sound stacking principles of sort-by-sort, access to be maintained, level surface, and the height will not exceed three times the base width.

Housekeeping must also be maintained at all times as this will be inspected and evaluated by the CLIENT during monthly audits.

8.5 Hazardous Chemical Substances

The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure the necessary training and information regarding the use and storage of HCS is provided to all personnel, and that the use and storage of HCS is carried out as prescribed by the HCS Regulations.

Furthermore, the PRINCIPAL CONTRACTOR/CONTRACTOR must ensure that all chemicals brought to site have a Material Safety Data Sheet (MSDS) and the users are made aware of the Occupational hazards and precautions that need to be taken when using the chemical.

The First Aider must also be made aware of the MSDS and how to treat HCS incidents appropriately.

Access to all HCS records shall be afforded to the CLIENT at all times.

8.5.1 Fuel / Diesel

- Bulk storage areas must be demarcated, secured and sign posted with the relevant warning pictograms.
- Bulk storage areas must be adequately bunded to ensure containment of 110% of the stored product.
- Re-fuelling must be conducted in designated re-fuelling areas only.
- Spill-kits must be available at all times in these designated areas.
- The surface of the bunded areas and walls must be of impermeable material.
- The bunded area must be sloped towards a collection pit.

8.6 Asbestos

The PRINCIPAL CONTRACTOR/CONTRACTOR must ensure the provincial director be notified prior to commencement of working with asbestos on this Project, and proof of such notification must be forwarded to the CLIENT for record purposes.

The PRINCIPAL CONTRACTOR must also ensure that all personnel and CONTRACTORS comply with the requirements of the Asbestos Regulations and that where work is to be done with Asbestos, only an approved asbestos contractor be used.

The CLIENT will conduct ad hoc inspections to verify compliance in this regard.

8.7 Plant and Machinery

8.7.1 Construction Plant

- All plant must comply with the OHS Act requirements in relation to operation and maintenance thereof.
- Records of service and maintenance of the vehicles must be of a high standard at all times.
- All plant shall subject to design be fitted with back-up alarms and audible indicating devices.
  The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that all construction plants moving parts are adequately protected.
- Pre-start inspections shall be conducted on all motorised equipment daily; deviations of such inspections shall be recorded.

- Construction plant identified for use shall be operated by a trained and authorised operator only.
- All construction plant shall be operated under the direct supervision of a person competent to identify potential hazards in the work he is conducting.
- Work involving the use of construction plant shall be conducted in accordance with an approved Risk Assessment.
- The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure all operators are equipped with the necessary PPE namely, safety shoes, overall, safety glasses, and gloves.
- All Plant shall be fitted with an extinguisher where practicable.
- Washing shall be conducted in the designated washing areas.

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that all equipment moving to and from site is adequately secured, and that all PRINCIPAL CONTRACTOR / CONTRACTORS abide by this requirement.

The PRINCIPAL CONTRACTOR/CONTRACTOR must provide proof of medical and psychological fitness including training of all operators engaged in the construction activity.

8.7.2 Transport of Personnel

- Should it be necessary for the PRINCIPAL CONTRACTOR/CONTRACTOR to transport their personnel to site, only safe vehicular transport must be provided. This shall include proper seating, side restraints and cover.
- No personnel shall be permitted to travel on any plant or equipment on the site works.
- Road safety principles shall be adhered to on and off site.

8.7.3 Vessels under Pressure (VuP) or Gas Bottles

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure they comply at all times with the requirements of Vessels under Pressure Regulations, with specific reference to the following:

- Ensuring all Equipment owned and hired-in Vessels under pressure, comply with the 36-month pressure vessel inspection, and a certificate of testing is available on site for inspection by the CLIENT.
- Ensuring that all personnel who shall use this equipment are competent and trained.
- Ensuring the users of this equipment are issued with the required PPE.
- Ensuring the area is adequately identified as a noise area and warnings are posted.
- Ensuring daily pre-start inspections are carried out on all the equipment and the findings recorded.
- Ensuring the correct fire prevention and fighting equipment is available at all times.
- Noise levels where possible shall be kept within reasonable operating norms.
- Ensure proper use and storage of gas during construction which may include trolleys upon which bottles are moved and chains to prevent bottles falling over.

The inspection of these activities will be included in the CLIENT's monthly safety audits.

8.7.4 Fire Equipment

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that all fire equipment to be used on site comply with the following:

- Extinguishers shall be placed in positions to ensure fast and easy access is always maintained.
- Placement of all extinguishers shall be depicted with the required pictograms.
- Extinguishers shall be serviced once annually, and after discharge or visible signs of depressurisation.
- The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure all employees are adequately trained in the safe use of the extinguishers and proof of training is kept on site for inspection by the CLIENT.
- The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure a person is appointed to inspect the extinguishers on a monthly basis and the results of which are to be entered into a register designed for that purpose.

8.7.5 Hired Plant and Machinery

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure the following criteria is adhered to when considering hired plant and machinery:

- Hired plant must be checked for safety compliance prior to being accepted for use on site, should a deviation be identified, the CLIENT reserves the right to order the removal of such equipment from site.
- Should hired equipment be accompanied by an operator, The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that the operators' competency be verified and the operator undergo an induction training session.
- The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure the operators of hired plant attend weekly toolbox talks in conjunction with The PRINCIPAL CONTRACTOR/CONTRACTOR site personnel.
- The PRINCIPAL CONTRACTOR / CONTRACTOR shall ensure that all operators are equipped with the required PPE before commencing work on site.

8.7.6 Scaffolding/Working at heights/Falsework/Formwork for Structures Fall Protection

Work involving scaffolding and work at heights shall comply with the requirements set out in the Construction regulations 2003 pertaining to these activities with reference to the SABS 085 code of practice.

Fall protection planning shall be done in conjunction with the risk assessment process, and a Fall protection Plan shall be provided to the CLIENT for approval prior any work involving work at heights is conducted.

All scaffolds shall be erected under the control of a person trained and appointed to conduct such scaffold erection.

Deviations found on any scaffolding, will result in the activity being stopped by the CLIENT until such time as compliance can be achieved.

8.7.7 Lifting Machinery and Tackle (Includes Tower Cranes)

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that the use of Lifting Machinery and Tackle is done in accordance with the requirements of the Regulations, which include but is not limited to the following:

- Lifting machinery and tackle to be used on site shall be marked with the Maximum Mass Load (MML), which is the safe limit in which the equipment may be used.
- Inspections on Lifting Machines and Lifting Tackle shall be inspected once per month on the register provided and the findings recorded.
- Daily pre-start checks shall also be conducted on all Lifting Machinery and Tackle.
- Records shall be kept of all lifting machinery and tackle inspections and Load Tests.
- Load tests shall be conducted a minimum of once per annum, and a certificate of compliance shall be kept on record.
- A valid logbook shall be maintained for all lifting machinery, which will comply with a minimum six-monthly service and maintenance.
- Lifting machinery shall be operated under supervision at all times with a trained banksmen who shall inspect all tackle before each lift.
- All lifting equipment operators shall be trained once every two years and a copy of such training shall be attached to the appointment, which is to be made on site.
- The Operators shall be tested for medical fitness.

8.7.8 Ladders and Ladder Work

The following requirements shall be complied with regarding Ladders and Ladder work:

- Ladders shall be clearly numbered and inspected on the register provided.
- A competent person shall be identified and appointed as the ladder inspector.
- Where aluminium ladders cannot be used, then wooden ladders shall be straight grained, unpainted to allow for proper inspection of the grain for cracking.
- Ladders shall be secured at the top and chocked at the base to prevent slipping.
- Where chocking of the base is not possible, then the user shall ensure that the ladder is held in position by another employee when ascending the ladder.

- Ladders shall be inspected a minimum once per month by the person appointed as the ladder inspector.
- Proper storage shall be provided for all ladders when not in use.

8.7.9 General Machinery

In accordance with General Machinery Regulation 2(1), The PRINCIPAL CONTRACTOR/CONTRACTOR shall:

- Ensure a competent person be appointed as defined in the above clause from the Occupational Health and Safety Act, 85 of 1993 and Regulations, to service and maintain all machinery in use on site.
- The PRINCIPAL CONTRACTOR/CONTRACTOR shall appoint additional competent persons to assist the competent person mentioned above in accordance with General Machinery Regulation 2(7)(a), as and when required.
- The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that records are maintained of all services conducted.
- The PRINCIPAL CONTRACTOR/CONTRACTOR shall provide to the CLIENT a copy of the above appointments prior to work commencing on site.

8.7.10 Lighting and Power

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure lighting circuits and power circuits are fitted with suitable earth leakage systems and installed by an approved authority.

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that:

- Earth leakage system will be tested monthly.
- Malfunctions shall be repaired immediately or replaced.
- Lighting shall be so positioned as not to interfere with construction activities.
- Lighting shall be provided to ensure adequate visibility under all conditions.
- Lighting and electrical installations shall be weatherproof.

8.7.11 Portable Electrical Tools / Explosive Power Tools

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure the following procedure is adhered to regarding Portable Electrical Tools and Explosive Powered tools:

- Minimum compliance with legislation.
- Only competent persons shall be permitted to conduct routine and monthly inspections on the equipment.
- Persons competent to inspect the equipment must be appointed in writing.
- Persons must be trained to operate such equipment and must be appointed and shall be the only authorised person to operate the equipment.

- The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure operation of the equipment is in accordance with an approved Risk Assessment and Safe Working Procedure.
- All users shall undergo regular awareness training to ensure compliance.
- The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure the required PPE and clothing is provided and maintained.

8.7.12 Public Health and Safety

In the interests of public safety, The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that all persons who may be affected by the work being conducted on site are informed and kept aware of the dangers, which may arise from the work being conducted on site.

This awareness shall be in the form of posters and inductions for visitors to site and warning signs.

8.7.13 Night Work

Night work shall only be conducted upon approval of the CLIENT, with the same safety standard being applied for these activities as with day work activities.

8.7.14 Facilities for Safe Keeping / eating areas

The PRINCIPAL CONTRACTOR/CONTRACTOR shall ensure that adequate facility is provided for the personnel on site. The area shall be providing the following:

- Sufficient seating.
- Seating under cover.
- Protected change room.
- Toilets.
- Hand wash facility.
- Potable water.

No food preparation shall be permitted on site and designated eating areas will be made to allow adequate seating.

Waste bins must be provided with plastic liners and must be strategically placed and cleared regularly.

9. MANDATORY AGREEMENT

AGREEMENT WITH MANDATORY
OCCUPATIONAL HEALTH AND SAFETY ACT, (Act No 85 of 1993) AGREEMENT WITH MANDATORY In terms of Section 37(1) and (2) **WRITTEN AGREEMENT ENTERED INTO AND BETWEEN**
(Hereinafter referred to as the Company) AND
CONTRACTOR (Hereinafter referred to as The Contractor) Compensation Fund Number: _____ AGREEMENT WITH MANDATORY TO BE COMPLETED IN BLACK INK AND EACH PAGE AND CHANGE TO BE INITIALLED.

Definition of Mandatory

Includes an agent, a contractor or sub-contractor for work, but without derogating from his status in his own right as an employer or user.

Occupational Health and Safety Act (No. 85 of 1993)

1. You are requested to, as far as you reasonably can, comply with the requirements of the OHS ACT and Regulations.

2. Your attention is drawn to "General Duties of Employers to their Employees" as required by Sect 8 of the Act

3. You are required to:

3.1. Sign a written "Agreement with Mandatory" as required by Sect 37(1)(2) of the Act with us before you commence any work on my/our premises / site.

3.2. Provide the client/principal contractor with a documented health and safety plan.

3.3. Provide the client/principal contractor with written appointment of the person who is going to supervise the construction work as per Construction Regulation 6(1).

Note: Electrician to provide copy of certificate of registration as per Elect. Install Reg. 9(3).

3.4. Provide the client / principal contractor with written designation of your nominated Health and Safety Representative as per Sect 17(1).

3.5. If you employ more than five (5) persons, you are required to provide your own First Aid Box. (General Safety Regulation 3 (2).)

3.6. If you employ more than ten (10) persons, you are required to provide your own qualified First Aider as per General Safety Regulation 3(4).

3.7. When working with hazardous chemical substances, comply with Hazardous Chemical Substances Regulation 3. Note: Asbestos and Lead regulations are separate.

3.8. When using a Materials Hoist, comply with Construction Regulation 17.

3.9. When using Lifting Machines and Lifting Tackle, comply with Driven Machinery Regulation 18

3.10. When using Explosive Powered Tools, comply with Construction Regulation 19.

3.11. When using Scaffolding, Formwork and support work, comply with Construction Regulation 10 and 14.

3.12. When Excavating or Demolishing, comply with Construction Regulation 11 and 12.

3.13. When Welding, Flame Cutting, Soldering, comply with General Safety Regulation 9.

3.14. When working in confined spaces, comply with General Safety Regulation 5.

4. You are responsible for providing your own legal safety documents and registers to comply with the Act's requirements. A copy of the OHS Act of 1993 should be available in the main contractor's office.

5. personal protective equipment which will allow them to carry out their work in a safe manner, e.g. hard hats, safety belts, gloves, safe footwear, eye protection, ear protection, waterproof clothing etc.

6. Reporting of Incidents and Occupational Diseases shall be done as per General Admin. Regulation 6. (Also see Sect 24 of the Act.)

Compensation for Occupational Injuries and Diseases Act (No 130 of 1993)

You are required to provide the client proof of registration with the Compensation Commissioner/Federated Employer's Mutual within seven (7) days after signing this agreement. Failure to do so would result in the client notifying the agent of the Commissioner to investigate and make an assessment of your wage return and the applicable levy you have to pay, which will be liable for a deduction from your monthly progress payments and paid over to the Commissioner. (Copies of proof of payment will be provided to the contractor) See Section 89(1) of the COID Act.

AGREEMENT WITH MANDATORY In terms of Section 37 (1) and (2)

Section 37 (1)	Whenever an employee does or omits to do any act which it would be an offence in terms of this Act for the employer of such employee or a user to do or omit to do, then unless it is proved that – a) in doing or omitting to to that act the employee was acting without the connivance or permission of the employer or any such user; b) it was not under any condition or in any circumstance within the scope of the authority of the employee to do or omit to do an act, whether lawful or unlawful, of the character of the act or omission charged; and c) all reasonable steps were taken by the employer or any such user to prevent any act or omission of the kind in question, the employer or any such user himself shall be presumed to have done or omitted to do that act and shall be liable to be convicted and sentenced in respect thereof; and the fact that he issued instructions forbidding any act or omission of the kind in question shall not, in itself, be accepted as sufficient proof that he took all reasonable steps to prevent the act or omission.
Section 37 (2)	The provisions of subsection (1) shall "mutatis mutandis" apply in the case of a mandatory of any employer or user, except if the parties have agreed in writing to the arrangements and procedures between them to ensure compliance by the mandatory with the provisions of the Act.

I,…….(Responsible person) for, ……(Company)

appoint, …… (Contractor) at the following premises / site: ……..

……..

Period:
……

AUTHORISED SIGNATORY FOR THE COMPANY (PRINCIPAL CONTRACTOR)

Signature	Designation	Date

ACCEPTANCE SIGNATORY FOR THE CONTRACTOR

I, …….. hereby acknowledge receipt of and accept and understand the requirements of this agreement and shall ensure compliance with the OHS Act 85, of 1993.

Signature	Designation	Date

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

10. MEASUREMENT AND PAYMENT

10.1 Principles

It is a condition of this contract that Contractors who submit tenders for this contract, shall make provision in t
General items included for this work.

a) Safety personnel

The Construction Supervisor, the Construction Safety Officer, Health and Safety Representatives, Health and Safety Committee and Competent Persons referred to shall be members of the Contactor's personnel, and no additional payment will be made for the appointment of such safety personnel.

b) Records and registers

The keeping of health and safety-related records and registers as described is regarded as a normal duty of the Contractor for which no additional payment will be considered, and which is deemed to be included in the Contractor's tendered rates and prices.

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

PART C2: PRICING DATA

VAAL CENTRAL WATER

CONTRACT NO. VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

PART C2: PRICING DATA

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VAAL CENTRAL WATER

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INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION C2.1: PRICING INSTRUCTIONS

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. This Bill of Quantities has to be read together with the Articles of the Agreement, the Conditions of Contract and Special Conditions of Contract, the Form of Tender, the General Specification, the Project Specification and the Drawings.

2. 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".

3. General instruction and description of the Work or materials given in the Specification will not be repeated in the Bill of Quantities. It will only be referred to. Doorbell of reference between brackets, to particular Clause in the Conditions of Contract(C-22) or, Special Conditions of Contract (SC-11), General Specification (19.1.3), Project Specification (PS 11) or to a Drawing (Drawing 33650.01-141-01).

4. The clauses in a specification in which further information regarding the schedule item appears under "Reference clause" in the Schedule. The reference clauses indicated are not necessarily the only sources of information in respect of scheduled items. Further information and specifications may be found elsewhere in the contract documents. Standardised Specifications are identified by the letter or letters which follow SANS in the SANS 1200 series of specifications, e.g. G for SANS 1200 G.

5. The quantities set out in the Bills of Quantities are the estimated quantities of the Contract Works, but the Contractor will be required to undertake whatever quantities may be directed by the Engineer from time to time. The Contract Price for the completed contract shall be computed from the actual quantities of work done, valued at the relevant unit rates and prices.

6. The prices and unit prices given in the Bill of Quantities is all-embracing prices and it should cover the values of the different items completely and has to include all costs and expenses which may occur and for the building of the Work as described and costs and expenses that are required as well as all general liabilities, obligations and risks which forms a part of this contract. The prices should be given separately in the item(s) if special accountability, responsibilities and risks as in the above occurs.

7. A price or unit price has to be filled in against every item in the Bill of Quantities even if the amount isn't shown. Items where no price or unit price has been filled in will be regarded as covered by the other prices and unit prices in the Bill of Quantities. VAT must not be included in the tariffs.

8. Unit rates would be regarded as correct if any difference occurs between unit prices and the total and the total will be corrected according to. The unit prices will be calculated arithmetically in case of omissions.

9. Payments will only be made for items occurring in the Bill of Quantities and if the Contractor thinks that provision hasn't been made for some items, the item should be allowed under another item.

10. 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.

11. 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)
m²	=	square metre	No.	=	number
m².pass	=	square metre pass	sum	=	lump sum
ha	=	hectare	MN	=	meganewton
m³	=	cubic metre	MN.m	=	meganewton metre
m³.km	=	cubic metre-kilometre	PC sum	=	Prime Cost Sum
l	=	litre	Prov sum	=	Provisional sum
kl	=	kilolitre	%	=	per cent
MPa	=	megapascal	kW	=	kilowatt

The Employer has the right whereas any measurements and/or payments were made before the final Payment Certificate to inspect it and if it is incorrect to correct it. The Employers has the right to remove and correct any work not complying with the specification before the submission of the last Payment Certificate.

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SECTION C2.2: SCHEDULE OF QUANTITIES

VAAL CENTRAL WATER

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INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION C2.3: SUMMARY OF SCHEDULES

SUMMARY OF SCHEDULES

SUMMARY:	WELKOM SMART WATER BILLING METERS, SMART CHAMBERS AND VALVES (VC-BWTW-B1 D)	
SECTION	**DESCRIPTION**	**AMOUNT**
1	**Site description:** VCW's installation of Welkom smart water billing meters, smart chambers and valves(VC-BWTW-B1 D)	R -
2	WATER METERS - MATJHABENG	R -
3	WATER METERS - NALA	R -
4	WATER METERS - VCW BALKFONTEIN & VIRGINIA	R -
5	WATER METERS - MINES	R -
6	GENERAL	R -
7	OCCUPATIONAL HEALTH AND SAFETY	R -
	SUBTOTAL	**R -**
	10% CONTINGENCIES	R -
	SUBTOTAL	**R -**
	15% VAT	R -
	TOTAL	**R -**

Page 1

water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

VAAL CENTRAL WATER

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INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION C2.4: BANKING DETAILS

VAAL CENTRAL WATER

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INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

FINANCIAL REFERENCES

(a). BANK RATING

1. It is requisite that a bank rating be obtained, bearing an original stamp by the relevant bank.

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

2. Failure to complete the bank rating Form overleaf may invalidate the tender rating should be based on highest contract value tendered for and the corresponding timeframe.

(b) FINANCIAL STATEMENTS

I/We agree, if required, to furnish an audited copy of the latest set of financial statements together with my/our Directors' and Auditors' report for consideration by the Employer.

(c) DETAILS OF COMPANY'S BANK

I/We hereby authorize the Employer/Engineer to approach all or any of the following banks for a reference:

DESCRIPTION OF BANK DETAIL	BANK DETAIL APPLICABLE TO COMPANY HEAD OFFICE	BANK DETAIL APPLICABLE TO THE SITE OF THE WORKS
Name of bank		
Branch name		
Branch code		
Street Address		
Name of manager		

DESCRIPTION OF BANK DETAIL	BANK DETAIL APPLICABLE TO	BANK DETAIL APPLICABLE TO THE
Telephone number	( )	( )
Account number		
Bank Rating		

…….. ……..
SIGNATURE OF TENDERER: DATE:

DECLARATION BY BANK MANAGER

This is to certify that the Tenderer has sufficient good standing with this bank that he will, in my opinion, be financially able to complete a contract to the value as entered, by the Tenderer, in Form C1.1 over the specified duration, or such other duration as the Tenderer may offer. In addition, we confirm that, for the amount of the enquiry, the Tenderer is rated Code

…….. ……..
SIGNATURE OF BANK MANAGER: DATE:

Place bank stamp here

VAAL CENTRAL WATER

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INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

PART C3: SCOPE OF WORK

VAAL CENTRAL WATER

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INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

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C3.2 STANDARD SPECIFICATIONS C3.2-1

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C3.4 PARTICULAR SPECIFICATIONS C3.4-1

VAAL CENTRAL WATER

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INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION C3.1: DESCRIPTION OF WORKS

C3.1.1 GENERAL DESCRIPTION

It is the objective of the Employer to solicit tenders from suitably qualified and experienced contractors for the INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

The project will provide opportunity for CIDB-registered contractors to participate in a large infrastructure project. The project is expected to take 6 months to reach practical completion from commencement and the Contractor shall be deemed to have based his tender price on this timeline and the time for achieving Practical Completion as specified in the Contract Data. Any material deviations from this program shall be clearly noted in the Contractor's tender submission as an alternative.

The primary objective of the project is to INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION which is not functional currently. Another objectives of implementing smart meters in the Municipality is to enhance billing accuracy and efficiency, to provide real-time, accurate readings of water consumption. This precision eliminates the inaccuracies associated with manual readings and aging infrastructure, leading to fair and transparent billing.

Furthermore, it is the Employer's objective to stimulate local economic development through this Contract and the Contractor will be expected to participate in the process by employing local labour and acquiring plant and materials from local enterprises as far as practically possible. The Contractor's attention is drawn to section T2.2.5 (Form R) – Local Economic Participation (LEP) Claim Form for more details on this important aspect of the Contract.

C3.1.2 Scope of the works

The Project Specifications form an integral part of the contract documentation, and it supplements the Standard Specifications.

The Standard Specifications which form part of this Contract covers work associated with general infrastructure projects and may therefore cover items not specifically applicable to this particular contract. The description of the work contained in this section is merely an outline of the Scope of Works but does not limit the work to be carried out under this Contract. Approximate quantities for each type of activity to be carried out under the Contract are listed in the Schedule of Quantities bound in this volume.

The primary objective of the project is installation and replacement of smart water billing meters and smart chambers which are not fully functional.

Specifically, the installation of PN 16 Smart Meters & Smart Chambers will include but not limited to

- Replacement of 40 x Billing Smart Magflo Meter Isomag WaMSS Scada Web Based with built-in transmission, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device and Valves in Matjhabeng LM.
- Replacement of 6 x Billing Meters, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device in Nala LM.
- Modification 9 x Chambers to Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device.
- Replacement of 9 x Flow Meter and LDS Flow Meters at Balkfontein and Virginia.
- Replacement of 34 x Billing Smart Magflo Meter Isomag WaMSS Scada Web Based with built-in transmission, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device and Valves at the Mines.
- Supply & Install WaMMS Scada System Web Based complete.
- Training and licensing of software to Vaal Central Water Board.

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION C3.2: STANDARD SPECIFICATIONS

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

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SECTION C3.2: STANDARD SPECIFICATIONS

APPLICABLE STANDARDIZED SPECIFICATIONS

1. The General Conditions of Contract applicable to this contract are the "General Conditions of Contract for Construction Works, 2nd Edition (2015)", issued by the South African Institution of Civil Engineering and the necessary amendments to the Standard Specifications have been made and included in the Project Specifications contained in this document.

2. The terms "Schedule of Quantities", (used throughout the Standard Specifications) and "Bill of Quantities", (used in all other documents forming part of this contract), are synonymous.

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SECTION C3.2: STANDARD SPECIFICATIONS

- SANS 1200: Standardised Specifications for Civil Engineering Construction
- SABS 719: Mild Steel Pipes
- SANS 50545 : Ductile iron pipes, fittings, etc.
- ISO 1940-1: Mechanical vibration – Balance quality requirements for rotors in a constant (Rigid) state: Specification and Verification of balance tolerance
- ISO 1940-2: Mechanical vibration – Balance quality requirements for rotors in a constant (Rigid) state: Balance Errors
- ISO 9906: Rotodynamic Pumps: Hydraulic performance acceptance test
- ISO 10816-1: Mechanical Vibration – Evaluation of machine vibration by measurements on non-rotating parts: General Guidelines
- ISO 10816-2: Mechanical Vibration – Evaluation of machine vibration by measurements on non-rotating parts: Industrial machines with nominal power above 15 kW and nominal speeds between 120 r/min and 15000 r/min when measures in situ
- ISO 10816-5: Mechanical Vibration – Evaluation of machine vibration by measurements on non-rotating parts: Machine sets in hydraulic power generating and pumping plants
- SANS 719-2011: Electric welded low carbon steel pipes for aqueous fluids (large bore)
- SANS 1123-2015: Pipe Flanges
- SANS 664-3-2011: Wedge Gate and Resilient Seal Valve for Water Works
- SANS 1551-2-2007: Check Valve (Flanged and Wafer Types)
- SANS 1849-2008: Butterfly Valve for General Purposes

- SANS 10142-1: 2017 Edition 2: The Wiring of Premises: Part 1: Low-Voltage Installations
- SANS 10160: basis of Structural Design and Actions for Buildings and Industrial Structures
- SANS 10161: Design of foundations for Buildings
- SANS 2001: Construction Works

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SECTION C3.2.1: VARIATIONS AND ADDITIONS TO THE STANDARDISED SPECIFICATIONS

The following variations and additions to the SANS 1200 Standardized Specifications referred to above apply to this Contract. The prefix PS indicates an amendment to SANS 1200. The letters and numbers following these prefixes respectively indicate the relevant Standardized Specification and clause numbers in SANS 1200 to which the variation or addition thereto applies.

PSA GENERAL
PSA 1 SCOPE

REPLACE THE CONTENTS OF SUBCLAUSE 1.1 INCLUDING THE NOTES, WITH THE FOLLOWING:
"1.1 This specification covers requirements, principles and responsibilities of a general nature which are generally applicable to civil engineering construction and building works contracts, as well as the requirement for the Contractor's establishment on the Site."

PSA 2 INTERPRETATIONS
PSA 2.3 DEFINITIONS

IN THE OPENING PHRASE BETWEEN THE WORDS "specification" AND "the following", INSERT THE WORDS "the definitions given in the Conditions of Contract and"
a) General

ADD THE FOLLOWING DEFINITIONS:

"General Conditions and Conditions of Contract": The General Conditions of Contract specified for use with this Contract, together with the Contract Data (GCC 2015). 'Specified": As specified in the Standardized Specifications, the Drawings, or the Project Specifications. 'Specification' shall have the corresponding meaning."

b) 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 variations in the value of the Contract Price or the time allowed in the Contract for the completion of the work. 'Time-related charge': A charge, the amount of which varies in accordance with the Time for Completion of the Works, adjusted in accordance with the provisions of the Contract.

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

PSA 2.4 ABBREVIATIONS

a) Abbreviations relating to standard documents.

ADD THE FOLLOWING ABBREVIATION:

"CKS: SABS Coordinating Specification."

PSA 3 MATERIALS
PSA 3.1 QUALITY

ADD THE FOLLOWING AT THE END OF SUBCLAUSE 3.1:

"All manufactured materials supplied shall be new materials unless the contrary is specified. All materials specified to be in accordance with SABS Specifications shall bear the SABS mark, where such a mark is available for the type of product."

PSA 4 PLANT
PSA 4.1 SILENCING OF PLANT

REPLACE THE CONTENTS OF SUBCLAUSE 4.1 WITH THE FOLLOWING:

"The Contractor's attention is drawn to the applicable regulations pertaining to noise and hearing conversation, framed under the Occupational Health and Safety Act. 1993 (Act No 85 of 1993) as amended.
The Contractor shall always and at his own cost, be responsible for implementing all necessary steps to ensure full compliance with such regulations, including but not restricted to the provision and use of suitable and effective silencing devices for pneumatic tools and other plant which would otherwise cause a noise level more than that specified in the said regulations.
Where appropriate, the Contractor shall further, by means of temporary barriers, effectively isolate the source of such noise to comply with the said regulations.

PSA 4.2 CONTRACTOR'S OFFICES, STORED AND SERVICES

ADD THE FOLLOWING PARAGRAPH BEFORE THE EXISTING FIRST PARAGRAPH IN SUBCLAUSE 4.2
"The Contractor's buildings, sheds and other facilities erected or utilize on the Site for the purposes of the Contract shall be fenced off and shall contain all offices, stores, workshops, testing laboratories, toilet facilities, etc. as may be required by the Contractor.

The facilities shall always be kept in a neat and orderly condition. No personnel may reside in the Site. Only night-watchmen may be on the Site after hours,"

DELETE "and first-aid services" IN THE SECOND PARAGRAPH OF SUBCLAUSE 4.2 AND ADD THE FOLLOWING:

"The Contractor shall provide on the Site and near the actual locations where the work is being executed, one toilet per 10 workmen, which toilets shall be effectively screened from public view and their use enforced. Such toilets shall be relocated from time to time as the location of the work being carried out changes, to ensure that easy access to the toilets is maintained.

PSA 5 CONSTRUCTION

PSA 5.1 SURVEY

PSA 5.1.2 Preservation and replacement of survey beacons and pegs subject to the Land Survey Act

DELETE THE WORDS

"In vicinity of boundaries" IN THE SECOND OF SUBCLAUSE 5.1.2 AND REPLACE THE WORDS "under the direction of" IN THE SAME SENTENCE WITH "in consultation and liaison with".

ADD THE FOLLOWING AFTER THE SECOND SENTENCE OF SUBCLAUSE 5.1.2:

"The Contractor and the Engineer shall record on the said list, their concurrence or disagreement (as the case may be) regarding the completeness and accuracy of the details recorded therein."

REPLACE THE THIRD SENTENCE OF SUBCLAUSE 5.1.2 WITH THE FOLLOWING:

"At the completion of the Contract, the Contractor shall expose all pegs that were listed at the commencement of the construction as being in order and the Contractor shall arrange with a registered Land Surveyor for the checking of the positions of all such pegs and the replacement of those that the Land Surveyor's check reveals have become disturbed or damaged. The Contractor shall, as a precedent to the issue of the Certificate of Completion, provide to the Engineer, a certificate from the registered land surveyor, certifying that all the pegs listed at the commencement of construction in accordance with the provisions of this clause, have been checked and that those found to have been disturbed, damaged or destroyed have been replaced in their correct positions, all in accordance with the provisions of the said Act.

The costs of checking, replacement, and certification as aforesaid shall be entirely for the Contractor's account. This, with the provision always that the Contractor shall not be held liable for the cost of replacement of pegs which:

a) Cannot reasonably be re-established in their original positions by reason of the finished dimensions of the permanent works, and
b) the Contractor can prove beyond reasonable doubt to the satisfaction of the Engineer, were disturbed, damaged, or destroyed by others beyond his control."

PSA 5.3 PROTECTION OF EXISTING STRUCTURES

REPLACE:
" Machinery and Occupational Safety Act, 1983 (Act No 6 of 1983)" WITH "Occupational Health and Safety Act, 1993 (Act No 85 of 1993), as amended," AND INSERT THE FOLLOWING AFTER "(Act No. 27 of 1956)": "as amended".

PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

REPLACE THE HEADING AND THE CONTENTS OF SUBCLAUSE 5.4 WITH THE FOLLOWING:

"PSA 5.4 LOCATION AND PROTECTION OF EXISTING SERVICES
PSA 5.4.1 Location of existing services
Before commencing with any work in an area, the Contractor shall ascertain the presence and actual position of all services which can reasonably be expected by an experienced and competent contractor to be present on, under, over or within the Site.
Without in any way limiting his liability in terms of the Conditions of Contract in relation to damage to property and interference with services, the Contractor shall, in collaboration with the Engineer, obtain the most up-to-date plans as are available, showing the positions of services existing in the area where he intends to work. Neither the Employer not the Engineer offers any warranty as to the accuracy or completeness of such plans and because services can often not be reliably located from plans, the Contractor shall ascertain the actual location of services depicted on such plans by means of careful inspection of the Site.
Thereafter, the Contractor shall, using appropriate methodologies, carefully expose the services at such positions as ate agreed to by the Engineer, for the purposes of verifying the exact location and position of the services. Where the exposure of existing services involves excavation to expose underground services, the further requirements of subclauses 4.4 and 5.1.2.2 of SABS 1200 D (as amended) shall apply.
The aforesaid procedure shall also be followed in respect of services not shown on the plans, but which may reasonably be anticipated by an experienced Contractor to be present or potentially present on the site.

All services, the positions of which have been determined as aforesaid at the critical points, shall henceforth be designated as "known services" and their positions shall be indicated by the Contractor on a separate set of drawings, a copy of which shall be furnished to the Engineer without delay.

As soon as any service which has not been identified and located as described above is encountered on, under, over or within the site, it shall henceforth be deemed to be a known service and the aforesaid provisions pertaining to locating, verifying, and recording its position on the balance of the site shall apply. The Contractor shall notify the Engineer immediately when any such service is encountered or discovered on the Site.

Whilst he is in possession of the Site, the Contractor shall be liable for all loss of, or damage as may occur to:

c) known services, anywhere along the entire lengths of their routes, as may reasonably be deducted from the actual locations at which their positions were verified as aforesaid, due cognizance being taken of such deviation in line and level which may reasonably be anticipated, and
d) any other service which ought reasonably to have been a known service in accordance with the provisions of this clause.

The Contractor shall also be liable for consequential damage regarding (a) and (b), whether caused directly by the Contractor's operations or by the lack of proper protection.

No separate payment will be made to the Contractor in respect of his costs of providing, holding available on the Site and utilizing the said detecting and testing equipment, nor for any costs incurred in preparing and submitting to the Engineer the Drawings as aforesaid. These costs shall be deemed included in the Contractor's other offered rates and prices included in the Contract.

Payment to the Contractor in respect of exposing services at the positions agreed by the Engineer and as described above will be made under the payment items (if any) as may be provided for in the respective sections of the specifications pertaining to the type of work involved.

PSA 5.4.2 Protection during construction

The Contractor shall take all reasonable precautions and arrange its operations in such a manner as to prevent damage occurring to all known services during the period which the Contractor has occupation and/or possession of the Site.

Services left exposed shall be suitably protected from damage and in such a manner as will eliminate any danger arising therefrom to the public and/or workmen, all in accordance with the requirements of the prevailing legislation and related regulations.

Unless otherwise instructed by the Engineer, no service shall be left exposed after its exact position has been determined and all excavations carried out for the purpose of exposing underground services shall be promptly backfilled and compacted. In roadways, the requirements of sub clause 5.9 of SABS 1200 DB should be observed. In other areas compaction is to be to 90% modified AASHTO density.

PSA 5.4.3 Alterations and repairs to existing services

Unless the contrary is clearly specified in the Contract or ordered by the Engineer, the Contractor shall not carry out alterations to existing services. When any such alterations become necessary, the Contractor shall promptly inform the Engineer, who will either make arrangements for such work to be executed by the owner of the service or instruct the Contractor to make such arrangement himself.
Should damage occur to any existing services, the Contractor shall immediately inform the Engineer, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases, the Contractor shall take appropriate steps to minimize damage to and interruption of the service. No repairs of telecommunications cables or electronic power line and cable shall be attempted by the Contractor.

PSA 5.7 SAFETY

REPLACE THE CONTENTS OF SUBCLAUSE 5.7 WITH THE FOLLOWING:

"Pursuant to the provisions of the Conditions of Contract, and without in any way limiting the Contractor's obligations thereunder, the Contractor shall at his own expense (except only where specific provision (if any) is made in the Contract for the reimbursement to the Contractor in respect of particular items), provide the following:

a) provide to its Employees on the site of the works, all safety material, clothing and equipment necessary to ensure full compliance with the provisions of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) as amended (hereinafter referred to as the Act) at all times and shall institute appropriate and effective measures to ensure the proper usage of such safety materials, clothing and equipment at all times.
b) Provide, install and maintain all barricades, safety signage and other measures to ensure the safety of workmen and all persons in, on and around the site, as well as the general public.
c) Implement on the site of the works, such procedures and systems and keep all records as may be required to always ensure compliance with the requirements of the Act.
d) Implement all necessary measures so as to ensure compliance with the Act by all subcontractors engaged by the Contractor and their employees engaged on the works.
e) Full compliance with all other requirements pertaining to safety as may be specified in the Contract.

The Employer and the Engineer shall be entitled, although not obliged, to make such inspections on the site as they shall deem appropriate, for the purpose of verifying the Contractor's compliance with the requirements of the Act. For this purpose, the Contractor shall grant full access to the site of all parts of the site and shall co-operate fully in such inspections and shall make available for inspection all such documents and records as the Employer's and/or Engineer's representative may reasonably require.

Where any such investigations reveal, or where it comes to the Engineer's attention that the Contractor is in any way in breach of the requirements of the Act or is failing to comply with the provisions if this clause, the Engineer shall, in accordance with the provisions of Clause 3.3.2 (GCC 2015) be entitled to suspend progress on the works or any part thereof until such time as the Contractor has demonstrated to the satisfaction of the Engineer, that such breach has been rectified.
The Contractor shall have no grounds for a claim against the Employer for extension of time and/or additional costs if the progress on the works or any part thereof is suspended by the Engineer in terms of this clause, and the Contractor shall remain fully liable in respect of the payment of penalties for late completion in accordance with the provisions of Clause 5.13.1 should the Contractor fail to complete the Works on or before the specified due completion date in consequence of the suspension.
Persistent and repeated breach by the Contractor of the requirements of the Act and/or this clause shall constitute grounds for the Engineer to act in terms of Clause 9.2.1.3.5 and for the Employer to cancel the Contract in accordance with the further provisions of the said Clause 9.2.

ADD THE FOLLOWING SUBCLAUSES TO CLAUSE 5:

PSA 5.9 SECURITY

PSA 5.9.1 Security of Contractor's Plant and Personnel

The Contractor shall note that, notwithstanding any insurances which may be by the Employer, the Contractor shall be responsible for the effecting of safety and security of plant and personnel on and around the site of the works, and that no claims in this regard will be entertained by the Employer.

The sum entered by the Contractor in the Schedule of Quantities for effecting of safety and security of plant and personnel on and around the site of the works shall be deemed to include full compensation for all the necessary to affect the safety and security including, where necessary, the employment of the services of a security organization.

PSA 5.10 SITE MEETINGS

The Contractor or his authorized agent will be required to attend regular site meetings, which shall normally be held once a month on dates and at times determined by the Engineer, but in any case, whenever reasonably required by the Engineer. Unless otherwise indicated in the Contract or instructed by the Engineer, such meetings shall be held at the Contractor's offices on the site. At such monthly meetings, matters such as general progress on the works, quality of work, problems, claims, payments, environmental issues, and safety shall be discussed, but not matters concerning the day-to-day running of the Contract.

PSA 6 TOLERANCES

ADD THE FOLLOWING SUBCLAUSE TO CLAUSE 6:

"PSA 6.4 USE OF TOLERANCES

No guarantee is given that the full specified tolerances will be available independently of each other, and the Contractor is cautioned that the liberal or full use of any one or more of the tolerances may deprive him of the full or any use of tolerance relating to other aspects of the work.
Except where the contrary is specified, or when clearly not applicable, all quantities for measurement and payment shall be determined from the 'authorized' dimensions. These are specified dimensions or those shown on the Drawings or, if changed, as finally prescribed by the Engineer, without any allowance for the specified tolerances. Except if otherwise specified, all measurements for determining quantities for payment will be based on the 'authorised' dimensions.
If the work is constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the calculation of quantities will be based on the 'authorised' dimensions, regardless of the actual dimensions to which the work has been constructed.
When the work is not constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the Engineer may nevertheless, at his sole discretion, accept the work of payment. In such cases no payment shall be made for quantities of work or material more than those calculated for the 'authorised' dimensions, and where the actual dimensions are less than the 'authorised' dimensions minus the tolerance allowed, quantities for payment shall be calculated based on the actual dimensions as constructed."

PSA 7 TESTING
PSA 7.2 APPROVED LABORATORIES

REPLACE THE CONTENTS OF SUBCLAUSE 7.2 WITH THE FOLLOWING:

"Unless otherwise specified in the relevant specification or elsewhere in the Project Specification, the following shall be deemed to be approved laboratories in which design work, or testing required in terms of a specification for the purposes of acceptance by the Engineer of the quality of materials used and/or workmanship achieved, may be carried out:

a) Any testing laboratory certified by the South African National Accreditation Systems (SANAS) in respect of the nature and type of testing to be undertaken for the purposes of the Contract.
b) Any testing laboratory which is owned, managed, or operated by the Employer or the Engineer.

c) Any testing laboratory established and operated on the Site by or on behalf of the Employer or the Engineer.
d) Any other laboratory that the Engineer approves in his absolute discretion."

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.1.1 Method of Measurement, All Sections of the Schedule

DELETE THE WORDS: "and South West Africa".

PSA 8.1.2 Preliminary and General Item or Section

PSA 8.1.2.1 Contents

"Separate items will be scheduled to cover the Fixed, Value-related and Time-related components of the Contractor's Preliminary and General Costs."

AND REPLACE THE WORDS "substantial completion" IN SUBCLAUSE 8.1.2.1(c) WITH "Certificate of Completion".

PSA 8.1.2.2 Tendered sums

REPLACE THE CONTENTS OF THIS SUBCLAUSE WITH THE FOLLOWING:

"Except only where specific provision is made in the Specifications and/or the Schedule of Quantities for separate compensation for any of these items, the Contractor's tendered sums under items PSA 8.3 and PSA 8.4 shall collectively cover all charges for:

- risks, costs and obligations in terms of the Conditions of Contract and of this standardized specification; and
- head-office and site overheads and supervision; and
- profit and financing costs; and
- expenses of a general nature not specifically related to any item or items of the permanent or temporary work; and
- providing such facilities on Site as may be required by the Contractor for the proper performance of the Contract and for its personnel, including, but without limitation, providing offices, storage facilities, workshops, ablutions, for providing services such as water, electricity, sewage and rubbish disposal, for access roads and all other facilities required, as well as for the maintenance and removal on completion of the Works of these facilities and for the cleaning-up of the site of the Contractor's establishment and reinstatement to not less than its original condition.
- providing the facilities for the Engineer and his staff as specified in the Contract and their removal from the Site on completion of the Contract."
- providing security for Contractor's Plant and Personnel
- compliance with Occupational Health and Safety.

PSA 8.2 PAYMENT

PSA 8.2.1 Fixed-charge and value-related items

REPLACE THE CONTENTS OF SUBCLAUSE 8.2.1 WITH THE FOLLOWING:

PSA 8.2.1.1 Fixed-charge items

"Payment of fixed charges in respect of item 8.3.1 will be made as follows:

a) EIGHTY PER CENT (80%) of the sum offered will be paid when the facilities have been provided and approved.
b) The remaining TWENTY PER CENT (20%) will be paid when the work has been completed, facilities have been cleared and cleaned to the satisfaction of the Engineer.

No adjustment will be made to the sum offered in respect of item 8.3.1 should the value of the works finally executed, or the time for completion vary in any way from that specified in the bid.

PSA 8.2.2 Time-related items

REPLACE THE CONTENTS OF SUBCLAUSE 8.2.2 WITH THE FOLLOWING:

"Subject to the provisions of sub clause 8.2.3 and 8.2.4, payment under item 8.4.1 (time-related item) will be made monthly in equal amount, calculated by dividing the sum offered for the item by the offered Contract period in months, provided always that the total of the monthly amounts so paid for the item is not out of proportion to value of the progress of the Works as a whole".

ADDITIONAL CLAUSES: Add the following:

PSA 8.2.8 Dismantle and remove structures/buildings and dismantle steelwork

The payment shall include all costs associated with the dismantling and demolition of all structures on site as directed by the Employer's Agent, all overheads and profit. The buildings identified include the existing staff offices and control room building and disinfection buildings which are built of brick and mortar as well as reinforced concrete floor slabs. **Unit: Sum**

PSC SITE CLEARANCE
PSC 8.2 SCHEDULED ITEMS
ADD THE FOLLOWING CLAUSE

PSC 8.2.11 Remove sludge, wastewater, trickling filter media and disinfect working area.

The payment shall include all costs associated with the activities plus overheads and profit. The activity shall involve the clearance of all processing buildings and structures which contain sludge, wastewater, contaminated media or surfaces and disinfection of these working surfaces. The proof of acceptable disinfection shall be given by a SANAS registered laboratory, and no work shall resume on infected surfaces unless proof of acceptable disinfection is accepted by the Employer's Agent. The processing units which require clearing and disinfection include the inlet works, all distribution boxes, anaerobic pond, maturation ponds, trickling filters, humus tanks, pumpstation sumps etc. the removed sludge and wastewater shall be dumped on identified sludge beds which must be prepared accordingly.

Unit: Sum

PSD EARTHWORKS
PSD 3 MATERIALS
PSD 3.1 CLASSIFICATION FOR EXCAVATION PURPOSES
PSD 3.1.1 Method of classifying
REPLACE THE CONTENTS OF SUBCLAUSE 3.1.1 WITH THE FOLLOWING:

"The Contractor may use any method he chooses to excavate any class of material, but his chosen method of excavation shall not determine the classification of the excavation. The Engineer will decide on the classification of the materials. Said classification will be based on the criteria as stated in PSD 3.1.2 as described below. All equipment described in PSD 3.1.2 to be in a good mechanical condition and be operated efficiently by an experienced operator. "**Efficiently**" meaning "in a manner that can reasonably be expected of a contractor, having regard for the production achieved". In the event of a disagreement between the Engineer and the Contractor, it shall be the responsibility of the Contractor, if so required and subject to the provisions of 4.1, to make available at his own expense such equipment as is specified in PSD 3.1.2 in order to assess the reasonable removability or otherwise of the material. The Engineers decision shall then, subject to the provisions of the contract, be final and binding."

PSD 3.1.2 Classes of Excavation
REPLACE THE CONTENTS OF SUBCLAUSE 3.1.2(a), (b) and (c) WITH THE FOLLOWING:
"The excavation of material will be classified as follows for purposes of measurement and payment:

(a) Soft excavation

1. Soft excavation shall be excavation in material that can be efficiently removed or loaded, without prior ripping, by the following plant:
   i. a track type back-acting excavator unit of total mass of approximately 30 t and flywheel power approximately 150 kW.

(b) Hard rock excavation

2. Material shall be deemed to be hard rock when a track type back-acting excavator unit with a total mass of approximately 30 t and a flywheel power of approximately 150 kW fails to achieve a trenching production rate of 10 m per hour.
3. Hard rock excavation shall be excavation in material that cannot be efficiently removed without blasting or without wedging and splitting.
4. Small quantities of hard material which can be removed by means of pneumatic equipment such as an excavator mounted hydraulic hammer or pneumatic hand tools will also be classified as hard rock.

(c) Intermediate excavation

1. There will be no intermediate classification of material for this contract. Material will be either soft excavation or hard excavation and will be classified as described in (a) and (b) above.

(d) Approval for Blasting

1. Permission for the use of explosives will only be given once the engineer has been notified that the hard excavation conditions have been encountered and when he has verified that excavation by conventional means is not possible.
2. All blasting will take place in accordance with the safety and security regulations applicable to such activities.

PSD 5.2.5.1 Free haul

REPLACE THE CONTENTS OF SUBCLAUSE 5.2.5.1(a) and (b) WITH THE FOLLOWING:

"The free haul distance within which the Contractor will be required to move material without separate compensation shall be 5 km."

PSD 7 TESTING

PSD 7.2 TAKING AND TESTING OF SAMPLES

The Contractor shall include in his rate for the cost of density testing. These tests will be carried out on each layer of material utilized for filling.

PSDA SANS 1200 DA: EARTHWORKS (SMALL WORKS)

PSDA 3 MATERIALS

PSDA 3.1 CLASSIFICATION FOR EXCAVATION PURPOSES

PSDA 3.1.1 METHOD OF CLASSIFYING

Add the following:

In case of excavation by hand, the following method of classification will be used:

3.1.2(a) **Soft excavation** will be classified as material which can be excavated with a pick and shovel. Should this material be measured with a DCP testing apparatus, the density of the material will be such that a penetration of not less than 10 mm per blow will occur for every layer of 150 mm.

3.1.2(b) **Intermediate excavation** will be classified as material which can be excavated with a pick and shovel and the penetration of a DCP testing apparatus is less than 10 mm per blow

3.1.2(c) **Hard Rock excavation** will be classified as material which can only be removed with compressed air equipment, wedging and blasting.

PSDA 3.1.2 Classes of Excavation

REPLACE THE CONTENTS OF SUBCLAUSE 3.1.2(a), (b), and (c) WITH THE FOLLOWING:

"The excavation of material will be classified as follows for purposes of measurement and payment:

(a) Soft excavation

1. Soft excavation shall be excavation in material that can be efficiently removed or loaded, without prior ripping, by the following plant:

i. a track type back-acting excavator unit of total mass of approximately 30 t and flywheel power approximately 150 kW.

(b) Hard rock excavation

1. Material shall be deemed to be hard rock when a track type back-acting excavator unit with a total mass of approximately 30 t and a flywheel power of approximately 150 kW ***fails to achieve a trenching production rate of 10 m per hour.***
2. Hard rock excavation shall be excavation in material that cannot be efficiently removed without blasting or without wedging and splitting.
3. Small quantities of hard material which can be removed by means of pneumatic equipment such as an excavator mounted hydraulic hammer or pneumatic hand tools will also be classified as hard rock.

(c) Intermediate excavation

1. There will be **no intermediate classification** of material for this contract. Material will be either soft excavation or hard excavation and will be classified as described in (a) and (b) above.

(d) Approval for Blasting

1. Permission for the use of explosives will only be given once the Engineer has been notified that hard excavation conditions have been encountered and when he has verified that excavation by conventional means is not possible.

2. All blasting will take place in accordance with the safety and security regulations applicable to such activities. Certificates of Competency and Permits must be available and should be produced for inspection at the request of the Engineer.

PSDB SANS 1200 DB: EARTHWORKS (PIPE TRENCHES)
PSDB 3 MATERIALS
PSDB 3.7 SELECTION
Add the following:

"Where suitable backfilling material is available in layers of 150 mm or more, it will be separated during excavation and utilized for backfilling. Should this material not be utilized, an estimation of the available quantity will be made and deducted from the material which was imported."

PSDB 5.6 BACKFILLING
PSDB 5.6.2 Material for Backfilling
Add the following:

"Rocks and rubble removed from the trench exceeding 250 mm in diameter will be deemed unsuitable for backfilling above the bedding (cradle and blanket) and should be separated and removed to spoil."

PSDB 5.6.4 Disposal of Hard Rock and Intermediate Material
Add the following:

"It is the Contractors responsibility to level the disposed spoil heaps and tip the following loads on the levelled material. The Contractor will not be permitted to dispose of unsuitable material by just dumping it onto the horizontal surface. Excess material which cannot be flattened sufficiently will be removed from site to an approved spoil site. All excavated rock material exceeding 250 mm in diameter is to be removed to an approved spoil site."

PSL MEDIUM PRESSURE PIPES
PSL 3 MATERIAL
PSL 3.10 Valves
PSL 3.10.1 Gate Valves

"All gate valves are to comply with SANS 1200 LK, must be of the "waterworks" type and be suitable for a working pressure of 16 bar. All valves to be clockwise (right hand) closing and the direction of opening and closing should be permanently displayed on the valve casing. Valves should be of the non-rising spindle type and be equipped with a square cap-top suitable for use with a valve spanner. Isolating valves should have a resilient seal rubber coated gate without a gate recess. All valves will be tested for watertightness. One valve spanner is to be provided for every 10 valves or less."

PSL 5.1.4 Depth and Cover

ADD THE FOLLOWING:

PSL 5.1.4.6 COVER

"A minimum cover of 800 mm is required over the top of pipes inside the road reserve, in street reserves, underneath roads or as specified by levels on long sections and plans. Where instructed, pipes are to be encased in concrete."

PSL 7 TEST
PSL 7.3 Standard Hydraulic Pipe Test
PSL 7.3.1 Test Pressure and Time of Test
PSL 7.3.1.2 Test Pressure

ADD THE FOLLOWING:

"Before any connections are made, pipes are to be tested to 1.5 times the working pressure of the specific class of pipe. After connections have been done, the complete network is to be tested at the maximum static pressure as specified by the Engineer."

PSL 8 MEASUREMENT AND PAYMENT
PSL 8.2.6 Specials

ADD THE FOLLOWING:

"Where the new works are to be connected to existing pipelines or fittings, all costs associated with the excavation, removal of fittings, cutting in, joining, labour and complete finishing are deemed to be included in the tendered price."

PSLB BEDDING PIPES
PSLB 3 MATERIAL
PSLB 3.3 Bedding
ADD THE FOLLOWING:

"Class C bedding as applicable to rigid pipes is required. Material for the Class C bedding will only be imported where insufficient suitable material is obtainable from the excavated material. The selected blanket materiaal must cover the pipe by at least 200 mm and not 300 mm as specified in the applicable General Specification.

Where large diameter uPVC pipes (> 300 mm diameter) are utilized, compaction on either side of the pipe should be carefully done in layers not exceeding 100 mm in thickness to ensure that the bedding and pipe act as a "pipe-soil system" to prevent ovality of the pipes occuring during backfilling"

PSLB 3.4 Selection

PSLB 3.4.2 Suitable Material not available from the trench excavation
ADD THE FOLLOWING:
"Should there during selective excavation methods (including screening) with the correct tools still be insufficient suitable material available for the bedding, material must be imported. The Contractor will find a suitable source of bedding material and submit it to the Engineer for approval.

The finding of a suitable source/quarry/borrow pit, loading, transport, placement and compaction of the imported material is deemed to be included in the rate tendered by the Contractor."

PSLB 5 CONSTRUCTION
PSLB 5.1.4 Compaction
ADD THE FOLLOWING:

"After excavation of the trench, the trench bottom will be levelled by means of a rake and compacted. Compaction may be conducted by hand tools. The required compaction to be achieved must exceed or equal 90% Mod AASHTO density.

After installation of the pipes, similar compaction must be applied to the blanket material. Now the final backfilling to 50 mm above the adjacent soil levels may be carried out. The total working area shall then be finished off. Only when specified by the Engineer will sidewalks be finished to specific standards and levels.

Where streets and roads are crossed, compaction of the bedding and backfill must be conducted by mechanical means to achieve a density of 98% Mod AASHTO."

PSG CONCRETE
PSG 2 Interpretations

PSG 2.1 Definitions (Subclause 2.3)

Under (a) add:

A Constructional joint: a joint required on account of constraints or convenience in the method of construction and that is not a movement, contraction or expansion joint.

PSG 2.2 Exposure Condition (Subclause 2.4.1)

All Concrete on the Works shall be as specified for severe exposure condition.

PSG 2.3 Strength Concrete (Subclause 2.4.2)

Grade 30 MPa/19 mm means strength concrete grade 30 MPa with 19 mm stone.

PSG 2.4 Joints

Notwithstanding Subclause 2.4.3, designed joints will only be joints that are shown on the drawings. Any other joints that are required by the contractor as a result of his construction constraints or for any other reason, whether approved by the Engineer or not, will not be considered to be designated joints as defined in Subclause 2.4.3, i.e. they will be considered to be non-designated joints.

PSG 3 MATERIALS
PSG 3.1 Cement (Subclause 3.2)

All cement used in the works shall be ordinary Portland cement complying with SANS 471.

PSG 3.2 STORAGE (Subclause 3.2.3)

Cement shall be used in the order in which it is received. Unless approved by the Engineer, cement kept in storage for longer than 8 weeks shall not be used in the Works. Any cement that contains lumps that cannot easily be crumbled to powder between the fingers may not be used.

PSG 3.3 Water (Subclause 3.3)

Only potable water from an approved source may be used for mixing concrete.

PSG 3.4 AGGREGATES (Subclause 3.4)

The nominal stone size specified in the concrete grade (e.g. 30 MPa/40 mm) shall mean stone conforming to the grading specified in SANS 1083 for the nearest equivalent size, i.e. 40 mm means stone that

PSG 3.4.1 Coarse Aggregate

PSG 3.4.1.1 Coarse Aggregate must comply with the 10% FACT requirements set for durability.

PSG 3.4.1.2 The nominal aggregate size is the smallest of the 37.5-millimetre maximum particle size and 25% of the slab thickness.

PSG 3.4.1.3 If the nominal aggregate size is larger than 26.5 millimetres, the coarse aggregate must consist of a mixture of aggregates larger than 26.5 millimetres and aggregates smaller than 26.5 millimetres.

PSG 3.4.2 Fine aggregate

PSG 3.4.2.1 Fine aggregate may not contain more than 40% Silicon particles.

PSG 3.4.2.2 Adjustments must be made to the mixture design if the Fineness Modulus of the fine aggregates varies more than ± 0, 2 during construction.

PSG 3.4.3 Mixture Design

A complete concrete mixture design must be submitted to the Engineer for approval before the commencement of the works.

The Contractor must have sufficient cube moulds to make test cubes on a daily base on request of the Engineer.

Care must be taken with the design of the mixture, to limit bleeding to a minimum. Special attention must be given to the fine aggregate if bleeding occurs.

PSG 3.4.3 Storage of aggregates

ADD THE FOLLOWING:

When aggregates of different chloride content are stored on the site, their use in the various classes of concrete shall be strictly controlled.

ADD THE FOLLOWING SUBCLAUSES:

SDG 3.4.4 Aggregate of dolomitic origin

Aggregates for structural concrete shall be of dolomitic origin. The quantity of insoluble matter in respect of concrete, made with aggregates of dolomitic origin, determined according to the method described in SABS 677, Appendix C, shall not be more than 15 %. complies with SANS 1083 for 37, 5 mm size. Aggregates with a shrinkage higher that 130% will not be allowed.

PSG 3.5 Samples (Subclause 3.4)

At least one month before commencement of concrete work the contractor shall supply, at his own cost, representative samples to the engineer of the aggregates he intends using, together with certificates from an approved laboratory indicating that the aggregates comply with the specifications. Approximately 50 kg of each sample of aggregate shall be supplied.

After approval, these samples shall be taken as standard for the agreed aggregates to be used in the Works. If at any time during the course of the Contract the Engineer considers that there has been any deviation from the approved standard the contractor shall submit further tested samples of material to the Engineer for approval.

PSG 3.7 Admixtures (Subclause 3.5.1)

The use of admixtures will be subject to the approval of the Engineer.
The information listed in Subclause 3.5.1 shall be provided.

ADD THE FOLLOWING SUBCLAUSES:

PSG 3.9 WATER STOPS

PVC water stops shall comply with the requirements of CKS 389.

PSG 3.9.1 Expansion Joints in the floor

The expansion joints will be of the type, shape and size as shown on the drawings. Examples of materials used must be submitted to the engineer for approval

PSG 3.9.2 Vertical and Horizontal Water stops in the Reservoir Wall.

"Galvanized steel plates, 2, 0 millimetre thick and 300 millimetres in width, will be used in all construction joints in the reservoir wall. Alternative materials can be used if it will have the same water tightening effect.

PSG 3.10 ROOFING FELT

Three-ply roofing felt shall comply with the requirements of SABS 192 for type 40 felt.

PSG 3.11 BUTYL RUBBER OR POLYMER SEALING STRIPS

The dimensions of the sealing strip for use in the structures are shown on the drawings. The strips shall be permanently bonded to the prepared concrete surface in accordance with the manufacturer's specifications.
The strip shall have a breaking elongation of not less than 300 % and a tensile strength of not less than 4 MPa as per manufacturer's specification.
The completed joint shall be guaranteed 100 % watertight and resistant to long-term effects of the retained aqueous liquid.

PSG 3.12 LAMINATED BUTYL RUBBER OR POLYMER WATERPROOFING STRIPS

3 mm thick laminated butyl rubber OR 2 mm thick polymer strips shall be permanently fixed to the concrete where shown In the Drawings.
The preparation of the concrete surface, the installation of bond breakers and aluminium backing strips, the fixing of the laminated butyl rubber of polymer waterproofing strip with an approved epoxy adhesive as specified by the particular manufacturer and the forming of lapped joints shall all be done according to the manufacturer's specifications to provide a watertight joint.

PSG 4 PLANT

PSG 4.1 Mixing plant and vibrators (Subclauses 4.3 and 4.4)

Standby mixers and vibrators of adequate capacity and with an independent power unit. Unit shall be maintained on site for immediate use in the event of breakdown of the regular mixers or vibrators or failure of the power supply.

PSG 4.2 Formwork Ties (Subclause 4.5.3)

The use of sleeves for formwork ties through the walls of water-retaining structures will not be permitted. Ties, when cast in, shall have some form of positive anchorage to prevent any rotation when loosening formwork.

PSG 4.3 Formwork: Chamfers and Fillets

Air exposed external angles in concrete work shall have 20 mm x 20 mm chamfers unless otherwise specified or ordered, but the top edge of a slab that is to receive and applied finish shall not be chamfered.

Internal corners in concrete work need not have fillets unless such fillets have been specified on the drawings or ordered by the Engineer.

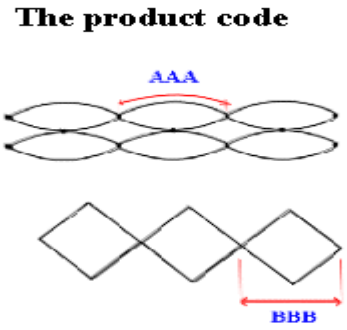
PSG 4.4 Water-bath

A temperature-controlled water-bath shall be provided on site. The water-bath shall be located under cover.

ADD THE FOLLOWING

PSG 4.5 Geo Cells Specification

Geo Cells flooring is composed of a honeycomb cell structure that is tensioned and fixed to the underlying layer of material. Its traditional presentation is in packages of 100 or 200 m^2 continuous, which can reach up to 600 m^2, which can be easily cut or joined to meet the shape and size of each specific project.
Once the cells are installed on the granular layer, they are filled with concrete by pumping or directly from the bucket of the mixer truck. A vibrating screed is used for the surface vibrating of the concrete and the surface finishing of the pavement can be done manually by sweeping with a brush or other tool.
The result is an articulated concrete pavement, made up of blocks that work collaboratively and does not require any type of reinforcing steel. The joint between blocks is of very low thickness, which benefits the load transfer mechanism and does not require joint sealing processes. The pavement is flexible, so it can tolerate a certain degree of movement on the surface and granular layers, but with the durability and strength of a rigid pavement



Explanation of product code

The code has the format AAA / BBB x CCC e.g. 300/210 x 100 where:

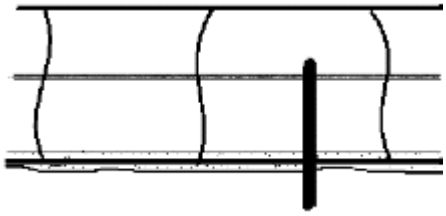
- **AAA** is the **weld separation** in mm. This is visible on the outer sheet of the compressed pack and may be used to check the cell size of packs without opening them out.
- **BBB** is the **diagonal across the opened cell**. Cells should be thought of as diamonds or "rotated squares". (The side of the square is half of AAA) This figure would be used on site to e.g. determine how many cells there should be across the width of the road. One would NOT use the side of the rotated square to measure dimensions of the site.
- **CCC** is the **depth** of the cell mattress.

Parameter	Value
Expanded dimension of one module	100 m²
Cell wall thickness	0.2 mm (200 micron)
Material	Special formulation of High-Density Polyethylene
Weld type	Heat sealed line weld
Other	-supply pre-strung with polypropylene rigging strings -supply Galvanised joining pins supplied -supply Y10 steel bar for staking out -supply concrete Plasticiser / retarder
Required product code	400/280 x 100
Weld-to-weld width (view collapsed)	400
Cell diagonal width when opened	280
Cell side dimension	200
Cell depth	100
Concrete	30 MPa High slump ready-mix concrete (with additives such as retarders and plasticisers)

Importance of the integral rigging

To enable the cell wall distortion which is so important for the mechanical interlock, the cells are fabricated from High Density Polyethylene (HDPE) film. The HDPE is also suitable for use with the concrete because it is impermeable with a smooth surface and does not stick to the concrete fill. This HDPE film is, however, lightweight and is not rigid.

There is a danger that the cells may collapse under filling, and they must therefore be supported. (For the same reason special attention must be paid to the concrete mix proportions). The laced rigging is supplied ex-factory. The rigging pulls the cells very taut and lends temporary rigidity for the filling operation.



Pegged rigging supports the cells

Cells are anchored to the underlying material and drawn into intimate contact with it by means of the integral laced rigging. The cell walls are flexible and so some inaccuracy of levels can be tolerated. Geo cells rigging supports the cells during filling and allows the cells to be struck off level with the top of the cell walls.

Edge Termination

Cells are flexible and can be draped to follow a radius of 100 mm to 200 mm (depending on cell depth). This allows a "tuck-in "termination edge beam to combat potential undercutting edge damage. A 300 wide x 450 deep edge beam shall be provided.

PSG 5 CONSTRUCTION
PSG 5.1 REINFORCEMENT
PSG 5.1.1 Fixing (Subclause 5.1.2)

Fixing of reinforcing bars by welding and heating of bars will not be permitted.

PSG5.1.2 Spacers

Spacers of approved design include approved plastic or other proprietary spacers, or purpose made precast mortar blocks.

Where mortar blocks are being used, they shall be properly shaped to slip out of position and shall be made of the same mix as the mortar of the concrete in which they are to be placed. The mortar shall be well compacted by approved means into the moulds to result in blocks with a density of at least 2 300 kg/m; and which are free from honeycombing. The mortar blocks shall be cured in water for at least 7 days. Blocks which have not been manufactured and cured strictly in accordance with these requirements or which are in any other way considered unsatisfactory by the Engineer, will be rejected and shall be removed from the site.

PSG 5.1.3 Cover (Subclause 5.1.3)

In Subclause 5.1.3(a) amend the words bar or stirrup to read: bar, secondary reinforcement, tie stirrup, tying-wire knots or wire ends.
Add to Subclause 5.1.3: (a) Tying wire may not encroach on the specified minimum cover by more than a single strand thickness. The cover to steel reinforcement shall not be less than 50 mm.

ADD THE FOLLOWING:

The Engineer will inspect the reinforcing ager, it has been fixed in place, the formwork has been cleaned, cover blocks have been positioned, and before concreting commences.
Welding reinforcing steel will not be permitted.

PSG 5.1.3 Cover

ADD THE FOLLOWING:

The distance between pipes in the concrete and the reinforcing steel shall nowhere be less than 40 mm or 5 mm plus the maximum size of the coarse aggregate, whichever is the largest, unless otherwise specified on the drawings.

PSG 5.2 FORMWORK
PSG 5.2.1 Classification of finishes

(c) Special Smooth Finish

All concrete surfaces that will be exposed above the final ground levels shall have a special smooth finish to a Degree of Accuracy. The formwork used shall be high-grade, unblemished and regular in size. Formwork ties shall be placed in a regular pattern. The special smooth finish shall be an off-shutter finish to the concrete such that no after treatment is required other than at the positions of formwork ties.

PSG 5.2.5 Removal of formwork

ADD THE FOLLOWING SUBCLAUSE:

PSG 5.2.5.7 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 and slabs.

PSG 5.3 CONCRETE

PSG 5.3.1 General (Subclause 5.5.1.1)

The concrete mix design for strength concrete must be prepared in an approved laboratory and the results of actual test mixes must be submitted for approval together with 7-day and 28-day strength test results. Special attention is drawn to the fact that the concrete mix used for water retaining structures must provide very dense and impervious concrete.

No concrete shall be cast until the mix designs have been approved by the Engineer. The Engineer may call for revised mix designs at any stage during the Contract.

PSG 5.3.2 Slump (Subclause 5.5.1.2)

The slump for vibrated concrete shall be a minimum of 30 millimeters and maximum of 70 millimeters and for hand-placed concrete a minimum of 70 millimeters and a maximum of 120 millimeters.

PSG 5.3.3 Workability (Subclause 5.5.1.3)

If the necessary compaction of the concrete cannot be obtained, a better-quality aggregate must be used. The use of more water or any addition of admixtures may not be considered without the written permission of the engineer.

PSG 5.3.4 Chloride Content (Subclause 5.5.1.4)

With reference to Table 4, efflorescence will not be acceptable on any exposed concrete surface.

PSG 5.3.5 Durability (Subclause 5.5.1.5)

Add the following
"The water/cement ratio of all concrete mixes will not be more then 0,53."

PSG 5.3.6 Strength Concrete (Subclause 5.5.1.7)

With the exception of mixes weaker than 15 MPa, all concrete for structural units/the Works shall be considered to be strength concrete in terms of Subclause 5.5.1.7. All structural concrete shall be according to the prescribed strengths.

PSG 5.3.7 Strength Concrete (Subclause 5.5.3.1)

Add the following

"If concrete is mixed by hand, the limit of the quantity of one single mix will be 0,25 cubic meters. Mixing will take place on a waterproof surface. The Cement and Sand will be mixed thoroughly before the addition of stone particles, whereafter the water will be added last.

PSG 5.3.8 Prevention and repair of plastic shrinkage cracks

The contractor shall take whatever measures are necessary to prevent plastic shrinkage cracking in the concrete. Particularly on dry windy days or hot sunny days the contractor shall make provision for fine spraying of the concrete with black plastic sheeting. It may be necessary to change the aggregates or the concrete mix proportions.

If plastic shrinkage cracking occurs, the cracks shall be closed up by revibrating the concrete with a poker vibrator, within about three hours of casting. Once the cracks have been closed, the concrete shall be kept thoroughly wet or covered with plastic sheeting for at least a further three hours.

PSG 5.4 CONSTRUCTION JOINTS (SUBCLAUSE 5.5.7)

PSG 5.4.1 General

The edge of joints, exposed to view in the finished structure, shall be formed with suitable beads to provide a straight edge true to line and level. As soon as practical, but not before 15 hours after placing, the construction joint surface shall be prepared to receive fresh concrete. This preparation, as specified in 5.5.7.3(a) to (d), shall be such as to improve all laitance or inert and strength less material which may have formed and the specified chipping or sand blasting, shall be such as to produce a roughened surface all over.

When concerting is interrupted, concrete surfaces shall be protected from the sun as specified in Subclause 5.5.8(d) of by means of hessian kept damp until concerting is resumed.

PSG 5.4.2 Formed Joints (Generally vertical or near vertical)

Formed joints will be considered to be designated joints as defined in Subclause 2.4.3. (The forming of a straight edge to a joint as specified in PSG 5-4,1 does not constitute a formed joint).

Each joint shall be formed as shown on the drawings, complete with shear keys rebates, waffle formwork, V-feature, water stops, Flexcell or similar joint filler, dowel bars and their PVC tubes, etc. as indicated.

PSG 5.4.3 Joints between Floors, Walls and Pillars

Construction joints between foundations or footings and walls, or piers standing on them, shall not be made flush with the supporting surface, but shall be made at a distance above the floor or footing shown on the drawings or approved by the Engineer. The kicker (starter stub) shall be cast as an integral part of the bottom, floor or footing.

PSG 5.5 CURING AND PROTECTION (SUBCLAUSE 5.5.8)

PSG 5.5.2 Formed Surfaces

In order to improve the effectiveness of the curing treatment, the specified minimum time for the removal of the formwork shall be four days.

PSG 5.5.3 Curing Compound

The use of membrane curing compounds will be allowed on vertical faces or steeply inclined faces (i.e. steeper than 45° to the horizontal) of cast in-situ members of the structures subject to the contractor producing sufficient, satisfactory cube crushing strength test results where the crushing strength of cubes which have been cured with the proposed curing membrane and left exposed to the elements are compared with those of an equal number of water cured cubes. The crushing strength of the cubes cured with the proposed membrane shall be at least 85% of the crushing strength of the water cured cubes.

The timing of power-floating is critical to its success. Power-floating steel shall not commence until the concrete can support the weight of a man without indentation and until the moisture sheen has disappeared. Thus several hours will have to elapse after concreting has been completed before this operation can commence. Night work may therefore be required.

This main objective of power floating the mortar skim on the no-fines under drainage layer is to achieve a plane, smooth surface. This need not be dense.

PSG 5.6 CONCRETE SURFACES (SUBCLAUSE 5.5.10)

PSG 5.6.1 Screeded finish

After placing and compacting, the concrete on a top (unformed) surface shall be struck off with a template to the designated grades and tamped with a tamping board to compact the surface thoroughly and to bring mortar to the surface, leaving the surface slightly ridged but generally at the required elevation. No mortar shall be added, and noticeable surface irregularities caused by the displacement of coarse aggregate shall be made good by re-screeding after the interfering aggregate has been removed or tamped.

PSG 5.6.2 Wood-floated finish (Subclause 5.5.10.1)

Where wood-floating is ordered or scheduled, the surface shall first be given a finish as specified in PSG 5.6.1 and, after the concrete has hardened sufficiently, it shall be wood-floated, either by hand or machine, only sufficiently to produce a uniform surface free from screeding marks.

PSG 5.6.3 Steel-floated finish

Where steel-floating is specified or scheduled, the surface shall be treated as specified in PSG 5.6.1 except that, when the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, the screeded surface shall be steel-trowelled under firm pressure to produce a dense, smooth uniform surface free from trowel marks.

PSG 5.6.4 Power float finish

Where power floating is specified or scheduled the surface shall be treated as specified in PSG 5.6.2 except that when the moisture film has disappeared, and the concrete has hardened sufficiently to prevent laitance form being worked in the surface, the screeded surface shall be power floated to produce dense, smooth and uniform surface free of all trowel marks. In corners and areas of restricted access the concrete surface shall be finished by steel floating in accordance with PSG 5.6.1.
The timing of power-floating is critical to its success. Power-floating steel shall not commence until the concrete can support the weight of a man without indentation and until the moisture sheen has disappeared. Thus several hours will have to elapse after concreting has been completed before this operation can commence. Night work may therefore be required.

The main object of power floating the mortar skim on the no-fines underdrainage layer is to achieve a plane, smooth surface. This needs to be done.

PSG 5.6.5 Broom-swept finish

Where broom-swept finish is specified, the surface shall be treated as specified in PSG 5.6.2 and hereafter swept transversely (to the direction of the roadway paving) with a stiff bristle broom to produce an approved no-skid finish.

PSG 5.6.6 GRANOLITHIC SCREEDS

PSG 5.6.61 General

Before placing any granolithic screeds, the base concrete shall be chipped to expose the aggregate to over 100% of the area to be screeded and soaked with water for at least 24 hours.

The base concrete shall be thoroughly cleaned by scrubbing and all standing water removed after soaking. A 1:2 cement/sand grout shall then be brushed into the prepared surface followed by the granolithic screed before the grout sets. The granolithic screed shall be of the driest feasible consistency with a slump not exceeding 50 mm and shall be formed true to profile and shape as required and shown on drawings. Before placing granolithic screed against and adjacent band of granolithic screed the edge of the latter shall be prepared by chipping back to firm material, wire brushing and brushing with grout as for the base concrete.

Granolithic screed shall be compacted to remove all air and shall be screeded and finished with a steel trowel to Degree of Accuracy 1.

The trowelling shall be carried out in the following stages: -

a) First – as soon as the granolithic screed has been compacted and screeded.
b) Second – after 2 hours to close the surface and remove laitance.
c) Third – after a further 24 hours.

The time intervals are estimated as appropriate to normal temperature conditions and shall be varied by the Contractor to ensure a smooth dense finish.

Granolithic screed shall be cured as specified in Subclause 5.5.8(b) but shall additionally be protected from direct sunlight and drying winds as it is being placed.

All screeding necessary to accommodate mechanical equipment shall be done under the equipment supplier's supervision and in strict accordance with his instructions. It shall be commenced as soon as the equipment supplier give notice on completion of erection and shall be finished expeditiously.

The Contractor shall make good any damage to the mechanical equipment resulting from his personnel not following the supplier's instructions. Any spillage on the equipment shall be cleaned off immediately.

PSG 7.2 TESTING

Add the following

PSG 7.2.5 Frequency and sampling

Notwithstanding the requirements of this sub-clause, the Contractor shall take note that he is responsible for taking an adequate number of tests to ensure that the concrete being used complies with the specification. The Engineer will only carry out such check testing as he requires.

PSG 7.2.6 Water Tightness Test

For the test of liquid retention, the structure shall be cleaned and initially filled to the normal

maximum level with water at a uniform rate of not greater than 2 m in 24 hours.

When first filled, the liquid level should be maintained by the addition of further liquid for a stabilizing period while absorption and autogenous healing take place. The stabilizing period may be 21 days.

After the stabilizing period, the level of the liquid surface should be recorded at 24 hours intervals for a test period of 7 days. During this 7-day test period, the total permissible drop in level, after allowing for evaporation and rainfall, should not exceed 1/500th of the average water depth of the full tank.

Notwithstanding the satisfactory completion of the test, any evidence of seepage of the liquid to the outside faces of the liquid-retaining walls should be assessed against the requirements of the specification. Any necessary remedial treatment of the concrete, cracks or joints should, where practicable, be carried out from the liquid face. When a remedial lining is applied to inhibit leakage at a crack it should have adequate flexibility and have no reaction with the stored liquid.

Should the structure not satisfy the 7-day test, then after the completion of the remedial work it should be refilled and if necessary, left for a further stabilizing period; a further test of 7 days' duration should then be undertaken in accordance with this clause.

PSG 7.2.6 Testing of Roof

The roof of the tank shall be watertight and tested on completion by flooding the roof with water to a minimum depth of 25 mm for a minimum duration of 24 hr. Where it is impracticable, because of roof falls or otherwise, to contain a 25 mm depth of water, the roof should have water applied by a continuous hose or sprinkler system to provide a sheet flow of water over the entire area of the roof for not less than 6 hr. In either case the roof should be considered satisfactory if no leaks or damp patches show on the soffit. Should the structure not satisfy either of these tests, then after the completion of the remedial work, it should be retested in accordance with this clause. The roof insulation and covering should be completed as soon as possible after satisfactory testing.

PSG 8 MEASUREMENT AND PAYMENT

PSG 8.1 Reinforcement (Subclause 8.1.2.2 and 8.1.2.3)

Notwithstanding the method of measuring and paying for reinforcement specified in Subclause 8.1.2.2 and 8.1.2.3, reinforcement will be measured and paid for as scheduled.

PSG 8.2 Concrete (Subclause 8.1.3.3)

The rates for concrete shall also cover:

1. The cost of the preparation of design mixes by an approved laboratory and submission for approval by the Engineer (PSG 5-3.1)
2. The cost of non-designated joints (PSG 2-2, 4)
3. Screeded finish of unformed surface as specified in PSG 5-6,1 and
4. Wood-floated finish to exposed surfaces as specified in PSG 5-6,2

PSG 8.3 Joints (Subclause 8.5)

Only designated joints as shown on the drawings will be measured for payment according to the length of each type of joint constructed (PSG 2-4). The rate shall cost of all materials, labour and plant required to construct each type of joint specified on the drawings, including the cost of all shuttering, treatment of the joint as specified in Subclause 5.5.7.3, the provision of chamfers as specified where concrete is exposed, as well as testing the repairing where necessary.

Non-designated joints will not be measured for payment.

PSG 8.4 Formed joints

Formed joints will be measured by the plan area of the joint.

The rates shall cover the cost of all operations and materials specified in Subclause 5.5.7 and PSG 5-4,2, and detailed on the drawings such as joint filler, dowel bars and tubes, bitumen coats, etc, but excluding water stops or water bars. Water stops and water bars will be measured by length separately for each type.

PSG 8.5 Formwork

PSG 8.5.1 Edges of Blinding Layer

No separate payment will be made for formwork to the edge of the blinding layer. The rates tendered for concrete to be blinding layer shall cover the cost of such formwork.

PSG 8.5.2 Kickers

Formwork to the edges of kickers will be measured as plain vertical or plain circular as applicable (not as narrow widths).

PSG 8.6 Unformed Surface Finishes (Subclause 8.4.4)

The rates for unformed surface finishes shall cover the cost of providing the respective surface finish as specified in PSG 5-6.

PSG 8.7 Holding Down Bolts

Fixing of holding down bolts will be measured by number. The rate shall cover the cost of all things necessary to ensure that the bolts are effectively and rigidly held in position during casting, complete with sleeved pockets, all as detailed on the drawings.

PSG 8.8 Grouting

Grouting of base plates and equipment bases will be measured by the volume of grout used.

The rate shall cover the cost of the supply and floating in the grout under the plates to ensure solid and complete filling of the gap.

PSG 8.9 Items cast in concrete

Items cast in concrete will be measured by number separately for each type of item.

Notwithstanding Sub clause 8.2.6, the rate shall cover the cost of fixing in position and casting in the item as construction proceeds, irrespective of whether the Contractor chooses to fix the item in the formwork and cast it in directly or to box out a hole and group the item in subsequently.

PSG 8.10 Testing for water tightness

The rate shall cover the cost of preparation for the testing which includes cleaning of the structure and filling to the normal maximum level with water at a uniform rate of not greater than 2 m in 24 hours. Maintaining the liquid level by addition of water for period of 21 days and then take daily records and measuring the liquid drop for seven days after the stabilization period. The rate shall include emptying and disposal of the test water and the cost of re-testing after remedial works if the structure has failed the initial test.....Unit : Sum

PSLD SEWERS
PSLD 3 MATERIALS
PSLD 3.1 PIPES, FITTINGS AND PIPE JOINTS

ADD THE FOLLOWING TO SUBCLAUSE 3.1.5:

"Pipes and specials for sewer mains and house connections shall be medium or heavy-duty multiplayer PVC-U pipes with a pipe stiffness of at least 200 kPa for medium and 400 kPa for heavy duty pipes."

PSLD 3.5 MANHOLES, CHAMBERS, ETC
PSLD 3.5.2 Precast concrete sections

ADD THE FOLLOWING:

"Sectional spun-concrete cylinders, mortar, benching and plastering shall be manufactured from dolomitic aggregate."

PSLD 3.6 MARKER POSTS

REPLACE THE WORDS "Project Specification" WITH "Drawings"

PSLD 5 CONSTRUCTION
PSLD 5.6 MANHOLES, INSPECTION CHAMBERS ETC

DELETE AND INSERT THE FOLLOWING:
"Manholes shall generally be precast concrete rings with sealed joints as detailed on Drawings SANS 1200 LD–5 and shall be installed according to the manufacturer's specifications. After the joints have been sealed with an approved sealant in accordance with Sub clause 3.5.2 the joints shall be covered on the outside by a double wrapping of polyethylene adhesive tape.
The flexible connections to the manholes shall be as shown in Drawings SANS 1200 LD-2.
Benching shall be constructed at a slope of 1 (vertical): 4 (horizontal).
The frames for manhole covers must be fixed to the top of the cover slab with 1:3 cement sand mortar.
Brickwork 220 mm thick with 1:4 cement sand mortar must be used for the correction of cover slab heights.
The depth of the shaft (min 300 mm) may not exceed 600 mm.
The top of manholes situated in the veld shall be 300 mm above existing ground level."

PSLD 5.9 CONNECTING SEWERS
PSLD 5.9.1 Location and details

DELETE THE FOLLOWING FROM THE FIRST PARAGRAPH:

"Or required in terms of the Project Specifications."

DELETE THE SECOND PARAGRAPH.

PSLD 8 MEASUREMENT AND PAYMENT
PSLD 8.2 SCHEDULED ITEMS
PSLD 8.2.11 Connection to existing sewer at

REPLACE THIS ITEM WITH THE FOLLOWING:

"PSLD 8.2.11 Connection to existing sewer manhole.....**Unit: sum**

The offered sum shall include full compensation for excavation, making an opening in the existing manhole, installing new pipes in the new opening, breaking out and modifying the channelization inside the manhole to suit the new pipe layout, ensuring the water tightness of the new connection, supplying all the necessary materials, removing surplus material and debris, all labour and equipment required to make the connection, and liaison with the local authorities."

ADD THE FOLLOWING ITEM:

"PSLD 8.2.13 Breaking into existing sewer and building a new manhole.... **Unit: Number**
The offered rate shall include full compensation for excavation, building a sewer manhole over the sewer, breaking into the existing sewer, building the channelization under wet conditions, ensuring the water tightness of the new connection, supplying all the necessary materials, removing surplus material, all labour and equipment required to make the connection, and liaison with the local authorities." the draw wire, jointing, bedding and providing all as specified.

SDX 4 Perimeter Fence and Access Gates

The contractor shall install a 1.8 m high diamond mesh fencing as illustrated in drawings as issued. The diamond mesh fence shall be attached to wire strips of 2 mm thick mild steel horizontal wire strips which are spaced at 200 mm. The horizontal strain wires with a wire diameter 2 mm gauge or higher which are galvanised. The aperture size (centres) shall be in the range of 76.2 mm x 12.7 mm maximum. The diamond mesh fence shall be installed as internal fencing especially around the maturation ponds.

The post shall be 1.5 m in height above ground and anchored in 400 square x 300 deep mass concrete of at least 15 MPa. The posts shall be 85 mm tapering to 45 mm with a depth of 85 mm taper post which are hot dip galvanised and coated with aluminium. The access gates shall be 2 leaf 3 m wide gates.

The perimeter fence shall be panel steel fencing with flood lighting, CCTV cameras and motion sensors mounted long the fence perimeter. The perimeter fence shall be according to the specifications and drawings provided. The perimeter steel wire panel fence shall be finished with an advanced marine fusion bond protective layer and with internal fixtures vandal proof. The panel fence shall be affixed with a 300 mm mesh extension anti-burrow under dig.

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION C3.3: PROJECT SPECIFICATIONS

Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

VAAL CENTRAL WATER

CONTRACT NO. VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION C3.3.1: GENERAL PROJECT SPECIFICATIONS

In the event of any discrepancy between the Project Specifications and a part or parts of SANS 1200 Standardized Specifications, the Schedule of Quantities or the Drawings, the Project Specifications shall take precedence. Where discrepancies arise with regard to the units of the payment items only, the units stated in the Schedule of Quantities shall prevail.

PS 1 CONSTRUCTION PROGRAMME
PS 2 SITE FACILITIES AVAILABLE
PS 3 SITE FACILITIES REQUIRED
PS 4 FEATURES REQUIRING SPECIAL ATTENTION
PS 5 INFORMATION SUPPLIED BY EMPLOYER
PS 6 EXTENSION OF TIME ARISING FROM ABNORMAL RAINFALL
PS 7 CERTIFICATES OF PAYMENT
PS 8 CONSTRUCTION IN LIMITED AREAS
PS 9 NON-WORKING DAYS
PS 10 SPOIL MATERIAL
PS 11 DRAWINGS
PS 12 LENGTH OF TRENCHES
PS 13 SAMPLES
PS 14 MANUFACTURER'S INSTRUCTIONS
PS 15 MATERIALS AND PLANT
PS 16 NOTICES, SIGNS, BARRICADES AND ADVERTISEMENTS
PS 17 SETTING OUT OF WORK
PS 18 WORKMANSHIP AND QUALITY CONTROL
PS 19 TRANSPORT OF MATERIAL
PS 20 LIAISON WITH LOCAL AUTHORITIES
PS 21 LOCAL LABOUR AND LOCAL SUBCONTRACTORS'
PS 22 TRAINING SCHEMES
PS 23 PRESCRIPTIONS IN RESPECT OF EXISTING SERVICES

PS 1: CONSTRUCTION PROGRAMME

It is a prerequisite of this contract that minimal disruption of the public is ensured during construction. Construction methods must be of such a nature that no property or life is endangered. The Municipality accepts no responsibility for any work done outside the site boundaries without the Engineer's approval. The Contractor himself is responsible for liaison and arrangements with the Engineer in connection with the finalization and approval of the construction programme.

The Contractor is responsible for liaison with residents and house owners via the Project Steering Committee in respect of the programming of construction through private erven and the crossing of driveways to erven. No additional payment will be made in this regard, and it shall be deemed to be covered by the relevant items.

Sufficient digital photographs of all existing structures and obstructions in the pipe line routes must be taken by the Contractor, compiled electronically, indexed and handed over to the Engineer before construction commences. A special payment item is included for a digital photo record in the Schedule of Quantities under other fixed-charge obligations.

The Contractor shall submit a programme of work to the Engineer not later than 14 (fourteen) days after the Contractor has been notified of the acceptance of his tender. This programme must take into account and allow for phased completion of the work. The Engineer may instruct the Contractor to stop construction work at any stage and time, as may be dictated by financial constraints highlighted by the Clients Cost Control Programme.

If necessary, the Engineer may instruct the Contractor to adjust his programme to suit other activities.

The programme shall not be in the form of a bar chart only, but shall clearly show the anticipated quantities, the production rates and value of work to be performed each month.

A network-based programme according to the precedence method shall also be provided showing the various activities and critical path in such detail as may be required by the Engineer. The programme shall be updated monthly in accordance with the progress made by the Contractor.

Failure to comply with these requirements will entitle the Engineer to use a programme based on his own assumptions for the purpose of evaluating claims for extension of time or additional payments.

If the programme submitted by the Contractor in terms of Clause 5.6 of the SAICE General Conditions of Contract (2015), has to be revised because the Contractor is falling behind in his programme, he shall submit a revised programme of how he intends to regain lost time to ensure completion of the Works within the period defined in Clause 1.1.1.14 of the General Conditions of Contract or within a granted extension of time. A proposal to increase the tempo of work must incorporate positive steps to increase production either by more labour and plant on the site, or by using the available labour and plant in a more efficient manner.

Failure on the part of the Contractor to submit or to work according to the programme or revised programmes shall be sufficient reason for the Engineer to take steps as set out in Clause 9.2.1.3.4 of the SAICE General Conditions of Contract (2015).

The approval by the Engineer of a programme shall have no contractual significance other than the Engineer will be satisfied if the work is carried out according to the programme. The said approval shall not limit the right of the Engineer to instruct the Contractor to vary the programme if necessary. The Contractor shall allow for the effect of normal rainfall and special non-working days in his programme.

(CRITICAL PATH MUST BE INDICATED ON PROGRAMME)

PS 2: SITE FACILITIES AVAILABLE

PS 2.1: Camp site

The Contractor shall negotiate with property owners and make his own arrangements to obtain sites for the erection of offices, laboratories, yards, etc. Written approval must be obtained from the owners on whose property the camp is to be situated. The choice of all sites for the establishment of camps is subject to the approval of the Engineer. Campsites within the road reserve will not be permitted.

PS 2.2: Water, electricity and sewage

The Contractor shall make his own arrangements concerning the supply of electrical power, water, telephone and all other services, both for use at the site establishment area as well as for the use in the construction of the Works. No direct payment shall be made for the provision of any service and the cost thereof shall be deemed to be included in the rates tendered for the various items of work for which these services are required.

PS 2.3: Rain gauge

The contractor must set up his own rainfall gauge. This item is included in the Schedule of Quantities under other fixed-charge obligations.

PS 3: SITE FACILITIES REQUIRED

PS 3.1: Facilities for the Engineer

No separate office is required for the Engineer's representative, but the Contractor must provide a table, a chair and a plan cupboard in one of his offices for the exclusive use of the Engineer's representative. The Engineer's representative shall be allowed free use of the Contractor's facilities. The Engineer's representative shall be allowed free use of survey equipment and survey assistants to carry out control work as and when required.

PS 3.2: Equipment for Engineering staff

The Contractor shall allow for providing the following protective clothing for the engineering staff:

1. 2 X high visibility vests
2. 2 X hard hats (white)
3. 2 X Sets of safety boots

The contractor shall supply the Engineer with a Business cell phone and be responsible for the monthly running cost, and other cost relating to the use of the cell phone.

PS 3.3: Water, electricity and sewage

The Contractor shall, at his own expense, be responsible for obtaining and distributing the water and electricity required for construction and domestic use. The distribution of water and electricity shall be carried out in accordance with the applicable laws and regulations.

No separate payment will be made for obtaining and distributing water and electricity, the cost of which will be deemed to be included in the tendered rates.

PS 3.5: Site instruction book

A triplicate book shall be provided by the Engineer to be used for site instructions. It shall at all times be kept on the site.

PS 4: FEATURES REQUIRING SPECIAL ATTENTION

PS 4.1: Access to properties

The Contractor shall organize the work in such a manner as to cause the least possible inconvenience to the public and to the property owners adjacent to or affected by the work included in this contract.

If, as a result of restricted road reserve widths and the nature of the works, the construction of bypass es is not feasible, construction shall be carried out under traffic conditions in order to provide access to the erven and properties.

The Contractor may, with the approval of the Engineer, make arrangements with the occupiers of the affected erven and properties to close off a portion of a street, road, footpath or entrance temporarily, provided the Contractor duly notifies the occupiers of the intended closure and its probable duration and shall, as punctually as possible, re-open the route at the prescribed time. Where possible, the road shall be made safe and re-opened to traffic overnight. Any such closure shall be made by arrangement between the Contractor and the occupiers and shall not absolve the Contractor from his obligations under the contract to provide access at all times. Barricades, traffic signs and drums shall be provided by the Contractor to suit the specific conditions. The Contractor shall also comply with all the requirements of the Local Authority with regard to safety, signage and notices to the public.

PS 4.2: Existing residential areas

Access to the adjacent residential areas shall be maintained at all times, as shall access to individual houses.

Electricity and water supply interruptions to existing residential areas shall be kept to a minimum. Whenever it is necessary to interrupt these supplies, the Engineer's approval shall first be obtained. The affected residents shall then be notified in writing at least 3 days, but not more than 5 days in advance. Supplies shall be normalized by 16:00 on the same day.

Cognisance shall be taken by the Contractor of the possibility of residents from the adjacent residential areas having access, whether authorized or not, to the works. It is strongly emphasized that under no circumstances shall any claims be considered for delays or disruptions as a result of the presence of residents from the adjacent occupied areas.

PS 4.3: Facilities to other Contractors

In addition to the requirements of clause 21 of the general conditions of contract, the Contractor must make allowance for the presence of other Contractors engaged on other contracts on the site, which may involve, inter alia, the adoption of his programme to fit in with work to be done by the other Contractors, as well as assuring other Contractors access to their sites along prescribed routes which may fall within the site of this contract.

PS 4.4: Contractor's vehicles

All equipment and vehicles used by the Contractor shall be roadworthy at all times and all drivers and operators shall be in possession of valid drivers' licenses.

PS 4.5: Site maintenance

During the progress of the work and upon its completion, the site of the works shall be kept and left in a clean and orderly condition. The Contractor shall at all times store materials and equipment for which he is responsible in an orderly manner and shall keep the site free from debris and obstruction. Workers shall lunch or have tea breaks only in a designated area with approved refuse and toilet facilities.

No open fires shall be permitted on the site.

Vehicles and workers must adhere to property demarcated access routes and not take or make short cuts.

PS 4.6: Testing and quality control

The Contractor shall engage the services of an approved independent testing laboratory for the testing of materials and the quality testing of layer works, to ensure that his work conforms to the specifications.

No separate payment will be made for such testing by an approved independent laboratory, the costs of which will be deemed to be included in the Contractor's tendered rates for the various items of work requiring testing in accordance with the specifications.

Certificates shall be submitted to the Engineer for all materials and equipment included in the works, where applicable.

PS 4.7: Subcontractors

The Contractor is responsible for work carried out on his behalf by subcontractors. The Engineer will not liaise directly with such subcontractors, and all problems relating to payments, programming, workmanship, etc, shall be the concern of the Contractor and the subcontractor, and the Engineer will not be involved.

PS 4.8: Existing Services

Before the Contractor commences operations, he must discuss with and have the approval of the Employer, authority or owner concerned regarding the method he proposes to use for relocating or safe guarding any services and existing works he may encounter during construction.

The positions of existing services shown on the Drawings are given in good faith and no guarantee can be given that:

(a) these services actually are in the approximate positions indicated.
(b) that these are the only services in the vicinity, and
(c) that the nature and description of these services are correct.

The Contractor shall be responsible to locate and safeguard any existing service or works he may encounter during construction and shall obtain clearance from the Employer, authority and the Engineer before commencing work in the proximity of existing services or works.

The Contractor shall be responsible for any damage to such existing services and works in the execution of this contract and shall reimburse the Employer, authority or the owner concerned for any repairs required and for damages.

The Contractor shall be responsible for immediately notifying the Engineer and the authorities concerned regarding any damage caused to public services and existing works.

Any alteration to public services shall be carried out by the Authority concerned unless the Contractor is instructed otherwise.

The Contractor shall provide the necessary assistance during any operations necessary in connection with the removal, alteration or safe guarding of any public service.

PS 4.9 Safety

The Contractor shall apply suitable proven methods for construction so that his activities will not constitute a hazard to the public or any adjacent property. All excavations shall be suitably safeguarded and barricaded especially during night time, weekends or holidays and any other day of inactivity by the Contractor.

PS 5: INFORMATION SUPPLIED BY EMPLOYER

Certain information contained in these contract documents, or provided separately, is being offered in good faith. However, in the circumstances pertaining to the type of information supplied, no guarantee can be given that all the information is necessarily correct or representative. More specifically this applies to all material surveys and reports and similar information, the accuracy of which is necessarily subject to the limitation of testing, sampling, the natural variation of material or formations being investigated and the measure of confidence with which conclusions can be drawn from any investigations carried out. It also applies to the positions of existing services as indicated on the drawings.

The Employer accepts no liability for the correctness or otherwise of the information supplied or for any resulting damages, whether direct or consequential, should it prove during the course of the contract that the information supplied is either incorrect or not representative. Any reliance placed by the tenderer on this information shall be at his own risk.

PS 6: EXTENSION OF TIME ARISING FROM ABNORMAL RAINFALL

If abnormal rainfall or wet conditions occur during the course of the Contract, the Employer may grant an extension of time in accordance with Clause 45 of the General Conditions of Contract, calculated in accordance with the formula given below for each calendar month or part thereof:

$$V = (Nw - Nn) + (Rw - Rn)/X$$

If V is negative and its absolute value exceeds Nn, then V shall be taken as equal to minus Nn.

The symbols shall have the following meanings:

V = Extension of time in calendar days for the calendar month under consideration.

When the value of V for any month exceeds the number of days in the particular month, V will be the number of days in the month.

Nw = Actual number of days in the calendar month on which a rainfall of Y mm or more were recorded.

Nn = Average number of days, derived from existing rainfall records, on which a rainfall of Y mm or more were recorded for the calendar month.

Rw = Actual rainfall in mm recorded on the Site in an approved rain gauge for the calendar month under consideration.

Rn = Average rainfall in mm for the calendar month, derived from existing rainfall records.

The total extension of time is the algebraic sum of all the monthly totals for the period under consideration, but if the total is negative, the time for completion will not be reduced on account of subnormal rainfall. Extensions of time for part of a month will be calculated by using pro rata values for Nn and Rn.
The factor (Nw - Nn) is considered a fair allowance for variations from the average number of days during which the rainfall exceeds Y mm.

The factor (Rw - Rn)/X is considered a fair allowance for variations from the average number of days during which the rainfall did not exceed Y mm but wet conditions prevented or disrupted work.
The average rainfall record for the past 10 years at the nearest rainfall station shall be for the purposes of this Contract are taken as normal rainfall refer to table below. Rn and Nn for this period shall be used and the values of X and Y are 20 and 10 respectively.
The rainfall records for Balkfontein (0364322 W) for the period 1923 to 1993 were used to determine the monthly averages (Rn and Na) for this period and shall for the purposes of this Contract be taken as normal.

Month	Nn (days)
January	2
February	2
March	3
April	1
May	2
June	0
July	0
August	0
September	0
October	0
November	0
December	1
Total	**11**

PS 7: CERTIFICATES OF PAYMENT

It was agreed that the master copy of the payment certificates would be drawn up and processed by the Contractor. All costs to this effect, as well as reproduction costs shall be to the account of the Contractor. It was agreed that the first month's certificate will be evaluated and if in order, the same format will be used throughout the contract.

PS 8: CONSTRUCTION IN LIMITED AREAS

In certain cases, working space may be limited. The method of construction in these restricted areas will depend largely on the Contractor's plant. However, the Contractor must note that measurement and payment will be according to the specified cross-sections and dimensions irrespective of the method used to achieve these cross-sections and dimensions, and that the rates and prices tendered shall be deemed to include full compensation for any difficulty encountered while working in limited areas and narrow widths, and that no extra payment will be made, nor will any claim for payment due to these difficulties be considered.

PS 9: NON-WORKING DAYS

The Contractor shall not work on Sundays or on the following statutory Public Holidays: New Years Day, Human Rights Day, Good Friday, Family Day, Freedom Day, Workers Day, Youth Day, National Women's Day, Heritage Day, Day of Reconciliation, Christmas Day and Day of Goodwill. Whenever any of the above statutory Public Holidays fall on a Sunday, the following Monday shall be a Public Holiday.

PS 10: SPOIL MATERIAL

No indiscriminate spoiling of material will be allowed. All surplus or unsuitable material shall be spoiled in designated areas as directed by the Engineer. Spoiling shall comply with the applicable statutory and municipal regulations.

PS 11: DRAWINGS

All "as built" information, as listed below, must be submitted to the Engineer's Representative before a certificate of completion will be issued. No separate payment will be made for the "as built" drawings

List of "as built" information required

(a) Exact coordinates or chainage on the centre line of the pipeline including the information regarding parallel or crossing of electrical, Telkom, Sewer and irrigation services.

(b) Exact coordinates and invert levels of all construction work

A Registered Land Surveyor shall be required to provide the above information.

Only figured dimensions shall be used and drawings shall not be scaled unless so instructed by the Engineer.

The Engineer will supply any figured dimensions which may have been omitted from the drawings.

PS 12: LENGTH OF TRENCHES

Where no limitations are imposed by construction stages and unless otherwise permitted in writing by the Engineer, not more than 200 m of trench in any one place shall be opened in advance of pipe laying operations.

No trench may be left open over the builders' holidays.

PS 13: SAMPLES

The Contractor shall at his own cost, supply all samples or tests that may be required. Material or work not conforming to the approved tests shall be rejected. The Engineer reserves to himself the right to submit samples to any tests to ensure that the material represented by the sample conforms to the requirements of the specifications. The cost of all tests failed shall be for the Contractor's account.

PS 14: MANUFACTURER'S INSTRUCTIONS

The recommendations of the manufacturers of patented materials must be strictly adhered to regarding the use, mixing, application, fastening, etc. thereof except when otherwise instructed in writing by the Engineer.

PS 15: MATERIALS AND PLANT

The contractor, when using materials that are required to comply with any standard specification, shall, if so ordered, furnish the engineer with certificates of compliance.

Where so specified, materials shall bear the official mark of the appropriate authority. Samples ordered or specified shall be delivered to the engineer's office on the site free of charge.

Where proprietary products have been specified, similar products may be used subject to the prior written approval of the engineer.

Unless otherwise specified, all proprietary materials shall be used and placed in strict accordance with the relevant manufacturer's current published instructions.

Unless anything to the contrary is specified, all manufactured articles or materials supplied by the contractor for the permanent works shall be unused.

Existing structures on the site shall remain the property of the employer and except as and to the extent required elsewhere in the contract, shall not be interfered with by the contractor in any way.

Materials to be included in the works shall not be damaged in any way and, should they be damaged on delivery or by the contractor during handling, transportation, storage, installation or testing they shall be replaced by the contractor at his own expense.

All places where materials are being manufactured or obtained for use in the works, and all the processes in their entirety connected therewith shall be open to inspection by the engineer (or other persons authorised by the engineer) at all reasonable times, and the engineer shall be at liberty to suspend any portion of work which is not being executed in conformity with these specifications.

The contractor shall satisfy himself that any quarry selected for use provides the necessary mined material in accordance with the specification.

PS 16: NOTICES, SIGNS, BARRICADES AND ADVERTISEMENTS

The Contractor shall erect the necessary signs, notices and barricades for the duration of the contract in order to safeguard both the works and the public.

Notices, signs and barricades as well as advertisements may be used only upon approval by the Engineer, and 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 have any sign, notice or advertisement moved to another position or to have it removed from the site of the works, should it in any way prove to be unsatisfactory, inconvenient or dangerous to the general public.

Such notices, signs and barricades shall be provided and erected at the Contractor's own expense.

The standard name board of the South African Association of Consulting Engineers is specified. The cost of which shall be included in the rates tendered for items 1300 (Colto) of the Schedule of Quantities.

PS 17: SETTING OUT OF WORK

Reference and level beacons will be shown to the Contractor by the Engineer at the commencement of the Contract and the Contractor will be responsible for transferring the data to the Site of Works.

The Contractor shall check the condition and accuracy of all reference and level beacons and satisfy himself that they have not been disturbed and are true with regard to position and level. A beacon that has been disturbed shall not be used until its true position and level have been re-established and the new values have been certified by the Engineer. The Contractor shall thereafter be held entirely responsible for the protection of all reference and level beacons.

The Contractor shall employ a capable surveyor to set out the Works to the required lines and levels. The Engineer shall be informed immediately should any discrepancy be discovered between the levels or dimensions obtained by the Contractor and those shown on the drawings.

Where a beacon is likely to be disturbed during construction operations, the Contractor shall establish suitable reference beacons at locations where they will not be disturbed during construction. No beacons shall be covered over, disturbed or destroyed before accurate reference beacons have been established and details of the positions and levels of such beacons have been submitted to the Engineer. The Contractor's reference beacons shall be of at least the same accuracy and sturdiness of construction as the existing beacons.

The Contractor shall submit the method of setting out he proposes to employ to the Engineer. Accurate control of line and level shall be provided by the Contractor at all stages of construction.

Work set out by the Contractor may be checked by the Engineer and any errors found shall be rectified by the Contractor at his own expense. The Contractor shall supply any instrument, equipment, material and labour required by the Engineer for this survey work. Any assistance, including checking given to the Contractor by the Engineer or any setting out done by the Engineer for Contractor shall not be held as relieving the Contractor of his responsibility for the accurate construction of the Works.

The Contractor's survey instruments and survey equipment shall be suitable for the accurate setting out of the Works and shall be subject to the approval of the Engineer. They shall furthermore be checked and correctly adjusted by the authorized agents before the commencement of the contract and subsequently when required by the Engineer and when otherwise necessary.

When required the Contractor shall, at his own expense, provide two labourers to assist the Engineer. The Engineer shall have the sole right of approving of such a labourer.

Survey work shall not be measured and paid for directly and compensation for the work involved in setting out shall be deemed to be covered by the rates tendered and paid for the various items of work included under the contract.

PS 18: WORKMANSHIP AND QUALITY CONTROL

The onus to produce work which conforms in quality and accuracy of detail to the requirements of the Specifications and Drawings rests with the Contractor, and the Contractor shall, at his own expense, institute a quality-control system and provide experienced Engineers, foremen, surveyors, materials technicians, other technicians and technical staff, together with all transport, instruments and equipment, to ensure adequate supervision and positive control of the works at all times.

The costs of all supervision and process control, including testing thus carried out by the Contractor shall be deemed to be included in the rates tendered for the related items of work.

The Contractor's attention is drawn to the provisions of the various standardized specifications regarding the minimum frequency of testing that will be required for process control. The Contractor shall, at his own discretion, increase this frequency where necessary to ensure adequate control.

On completion of every part of the work and submission thereof to the Engineer for examination, the Contractor shall furnish the Engineer with the results of all relevant tests, measurements and levels to indicate compliance with the specifications.

PS 19: TRANSPORT OF MATERIAL

All costs of transporting material shall be included in the applicable tendered rates.

PS 20: LIAISON WITH LOCAL AUTHORITIES

The Contractor will have to liaise with local authorities regarding the following matters:

(a) Dealing with traffic.
(b) Locating of existing underground services.
(c) Protection of existing services during construction.

All the relevant authorities were notified of above operations. It is then the Contractor's onus to immediately contact all these authorities and to accommodate their involvement in his programme of work. The Contractor should also warn the authorities at least 48 hours before the actual work commences. Compensation for delays, losses or accidents will not be considered should the Contractor at any time have failed to keep the local authorities informed.

The Engineer or Employer must immediately be notified, should the Contractor experience any problem regarding work which involve a local authority.

PS 21 LOCAL LABOUR AND LOCAL SUBCONTRACTORS

PS 21.1 Introduction

It is envisaged that the works will be constructed by one Contractor employing local labour to construct the work applying the principles of the Expanded Public Works Programme (EPWP).

PS 21.2 Workload

The Contractor is required to execute certain components of this contract with labour-based construction methods as described in paragraph PS 10.6.

PS 21.3 Assisting Approved Business Enterprises (ABE's)/Approved Sub-contractors

The Contractor is required to assist ABE's in accordance with the Contractors proposal included in his/her tender.

PS 21.4 Local Labour

It is the intention that this Contract should make maximum use of the local labour force that is presently under-employed. To this end the Contractor is expected to limit non-local employees to key personnel only and to employ and train local labour on this Contract. The Contractor shall complete the form: T2.2.5: Labour Utilisation and state how many non-local key personnel he intends to employ in the various categories.

The numbers stated on the above-mentioned form will be strictly controlled during the Contract period and any increase in numbers is subject to the approval of the Employer.

A Project Steering Committee (PSC) has been formed and consists of representatives of the affected community, Mangaung Local Municipality and the Engineer. The PSC is up to date with the details of the project and appointment of all local labour must be through the PSC.

The Contractor will be required to arrange his own documentation regarding a contract for locally employed labour and must include provisions for the Occupational Health and Safety Act (1993) and the Compensation for Occupational Injuries and Diseases Act. The minimum daily wage to be paid in accordance with the Wage Bill for the geographical area shall be as stated in the Government Gazette in terms of Wage Determination for the Civil Engineering Industry.

PS 21.5 Contractors Obligations

The Contractor is to supply the Engineer with copies of the agreements between himself/herself and his/her subcontractors within twenty-one (21) days of the contract being awarded.

Should the Contractor be unable to or unwilling to:

i) Subcontract the required Works as detailed in his/her tender document;
ii) Submit the necessary documentation to prove that he/she is subcontracting the work as specified in paragraph PS 10.6.
iii) Implement his/her proposed training scheme or any other scheme agreed to by the relevant parties;

the Employer reserves the right to:

a) nullify the said contract and re-issue it to tender;
b) nominate available local subcontractors for the required Works;
c) deduct payment from the monthly certificates, the value of which will be calculated as follows:

$$X = Y - Z$$

X = Amount of deduction from the monthly certificate
Y = Value of the work that should have been undertaken by the subcontractor
Z = Value of the work actually undertaken by the Subcontractor during the month;

(d) = Nominate agents to undertake the proposed training at the expense of the Contractor.

PS 21.6 Work Considered to be Labour Based

It is a condition of this contract that the following components of work must be executed using labour-based construction methods.

1) Excavation of soft/ intermediate / hard material in trenches not deeper than 1,5 m.
2) Shaping of open drains.
3) Preparation of pipe bedding.
4) Laying and jointing of all pipes.
5) Backfilling of all trenches with compaction excluded.
6) Location of existing services.

Note:
The abovementioned work must either be done by local labourers employed by the Contractor or by local subcontractors. In the Schedule of Quantities, as an alternative to machine excavation, the cost of a compulsory labour-based construction activity is covered by using the standard Colto payment item (where applicable). Site conditions and material present will dictate the application of labour-based trench excavation or machine excavation. A prerequisite for payment of these labour-based excavation items is that the Contractor keeps daily written records with names of labourers, tasks completed, man-hours spent, and payments made.

Items excluded from labour-based items:

1) Excavation in Boulders and rock material - Mechanical excavators and blasting allowed.
2) Compaction of bedding and backfilling - Rollers and plate compactors allowed.
3) Transport of materials LDV, dumpers and other transport equipment allowed.
4) Mixing of concrete - Mechanical mixers allowed.
5) Vibration of concrete - Vibrators compulsory.
6) Precast concrete manholes.

PS 22 TRAINING SCHEMES

Certain members of the Contractors staff will be selected from the locally recruited employees, to be subjected to training in tasks related to the execution of the contract. An item with a provisional sum to cover the cost of training is included in the Schedule of Quantities.

The PSC will select the trainees and decide upon the specific training for each of them. The Contractor must guide PSC in this regard and make all the necessary arrangements with the training institution and the trainees, to ensure that the process runs smoothly. This training must be completed before the Contractor will receive any payments.

The provisional sum in the Schedule of Quantities is to cover the fees of the training institution and a R 50 per day allowance for each trainee during training. All other costs, including transport of trainees, will be borne by the Contractor and should be included in the percentage handling fee of the Contractor.

PS 23 PRESCRIPTIONS IN RESPECT OF EXISTING SERVICES

The scope of works for this contract could be affected by existing services. Where necessary the contractor must familiarize himself with the position and extent of existing services and to carry out the works in such a manner as not to cause damage to existing services.

PS 23.1 Water and Storm Water Services

Any cost of repairs, replacement and/or installation of services and equipment resulting from the contractor's negligence or unauthorized action shall be to the contractor's account.

PS 23.2 Electrical Services

The following procedures will apply:

1. The Contractor will in all instances submit construction drawings to the Electricity Supply Authority (ESA) for comments and for ESA to indicate known electrical services. These drawings will in all instances be available on site during the construction period or in the possession of the supervisor of the construction workers.

2. The cable's precise position on the terrain, with reference to the approximate position as indicated on the drawing, must be confirmed on terrain by means of cable tracing equipment to be supplied or arranged by the Contractor for this purpose. In the case of primary cables (11 kV and 33 kV) as indicated on the drawings, it is essential that cable tracing be conducted by ESA. The Contractor will provide sufficient white lime to mark the cable on the ground. The contact persons and telephone numbers for cable tracing personnel shall be obtained from ESA by the Contractor.

3. The Contractor must thereafter, very carefully, open up the cable by hand on at least two places, of which the in between distances will not exceed 50 meters.

4. At any position, between any two points of the exposed cable as described in 1.3 above, that cable shall be identified as a known service if it lays within 0,5 meters of a straight line drawn between these two points

    4. If the cable lays further than 0,5 meters away from a straight line drawn between the two exposed points, it shall be identified as an unknown service.

6. With reference to the approximate position of cables on the drawing, the Contractor will be responsible for confirming the location of such cables on terrain by means of the equipment referred to in 1.2 above, and by careful digging by hand. If the exact position of the cables cannot be determined without doubt, ESA can be approached for help.

7. When existing electrical cables fall within the excavation area of the new service, the Contractor will be responsible for protecting and supporting such cable. During backfilling of the trench, the Contractor will ensure that the cable is not damaged and repositioned at the original position and depth with the necessary bedding and marker tape.

8. Before any exposed cables are backfilled, such cables shall be inspected for possible damage by the terrain agent, in the presence of the Engineer or his/her representative. A complete record of all positions where cables were exposed must be indicated on the drawing.

9. The Contractor is responsible for keeping a complete record of incidents where electrical cables (known or unknown) were damaged that includes the following:
   - Date when damaged and the reason
   - Date when repaired
   - The extent of repairs, for instance cable size, number of joints necessary, the length of cable replaced etc
   - The exact cable position and depth indicated on the plan

10. The Engineer's representative must check these records. The above-mentioned record will be an annexure to the minutes of the monthly site meetings. All repairs of damaged cables (known or unknown) will be conducted by ESA. The account for repairs done on known services (cables) will be delivered to the Contractor via the Engineer. On the basis of accounts delivered monthly by ESA, the repair cost of a known service (electrical cable) that was damaged, will be recovered from the Contractor's certificate.

11. 33 kV Cables
In no instances will any Contractor be allowed to expose cover 33 kV cables or excavate closer to 500 mm (by hand) and 2000 mm (mechanical excavation) from the centre of a 33 kV cable. ESA will do the required excavation for the Contractor's account.

12. Overhead Services
Excavation and backfill shall be such that no foundation of overhead structures (power lines, streetlights, high mast lights, stays etc.,) will be disturbed. If disturbed, the Contractor will inform ESA in writing and will reinstate the foundation to its original state.

13. Maintenance Period

During the maintenance period the Contractor's responsibility shall include: All electrical cables that were exposed or handled by him. Excavations in the vicinity of poles and stays, at the time of the construction activities. This makes provision for instances where damaged cables were covered up without informing ESA that may cause many problems later on. The Contractor is responsible to repair all disturbed pole and stay foundations and to reinstate it to its original condition (electrical and structural), as they are disturbed.

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

SECTION C3.4: PARTICULAR SPECIFICATIONS

PARTICULAR SPECIFICATIONS – MECHANICAL

STANDARD MECHANICAL SPECIFICATIONS APPLICABLE TO THIS CONTRACT

The latest editions of the following standards shall apply to this contract:

- SANS 10400: The application of the National Building Regulations
- SANS 10252: Water supply and drainage for buildings.
    - Part 2: Drainage installations for buildings.
- Occupational Health and Safety Act (Act No.85 of 1993)
    - General Machinery Regulations.
- All municipal regulations pertaining to building codes, health, and safety requirements.
- ASME 31.3 Process Piping Code
- ASME II PART C 2013 - Specifications for Welding Rods, Elect
- SANS 1431: Weldable Structural Steel
- API 1104: Standard for Welding Pipelines and Related Facilities.
- SANS 1123: Flanges
- SANS 664: Resilient Seal Gate Valve
- ASME IX 2013 - Welding, Brazing, and Fusing Qualifications
- ASME V 2013 – Non-destructive Examination
- (OSHACT) Occupational Health and Safety act, Act 85 of 1993
- National Building Regulations – SABS 0400
- Local municipal by-laws and regulations as well as regulations of the local electrical supply authority.
- SANS 724 – Personal Protective Equipment and Protective clothing against thermal hazards of an electric arc

This portion of the Project Specifications relates to particular items in the Scope of Works.

GENERAL

1. INTRODUCTION

(a) These Standard Specifications cover the general technical requirements for the equipment, materials, installation, testing, commissioning, and maintenance of mechanical installations for the Employer. These requirements shall be read in conjunction with the Documents as specified below.

(b) "Document" shall mean the complete set of contract documents, including the Employer's Tender Conditions, Tender Qualifications, the Standard Specification, and the Detail Technical Specification including all drawings and variation orders issued in terms of the contract.

(c) "Contractor" shall mean the person, partnership, company, or firm appointed for the supply, installation, testing, commissioning, and maintenance of the Mechanical Installation. In the case of the Mechanical Installation being a sub-contract, nominated in terms of the Main Contract or otherwise, the word "Contractor" shall also mean "Sub-Contractor" in terms of the Sub-Contract Conditions for the specific installation. Where applicable the Builder or Principal Contractor shall be referred to as "Main Contractor".

2. INSTALLATION WORK

(a) The complete installation shall comply with the requirements of this Specification. Should any discrepancies or contradictions exist between this specification and the Detail Technical Specification for the specific installation, then the latter shall take precedence.

In the event of discrepancies between the drawings, specifications and bill of quantities the Engineer shall decide whether the work as executed shall be remeasured on site or whether remeasurement shall be effected from the working drawings only.

(b) The Employer's authorised representative will inspect the installation from time to time during the progress of the work. Discrepancies will be pointed out to the Contractor, and these shall be remedied at the Contractor's expense. Under no circumstances shall these inspections relieve the Contractor of his obligations in terms of the Documents.

(c) The Contractor shall notify the Engineer timeously when the installation reaches important stages of completion (e.g., before closing cable trenches, before casting concrete, etc.) so that the Employer’s authorised representative may schedule his inspections in the best interest of all parties concerned.

3. REGULATIONS

(a) The installation shall be erected and tested in accordance with all relevant SANS standards.

(b) The Contractor shall issue all notices and pay all the required fees in respect of the installation to the authorities and shall exempt the Employer and Employer’s Representatives from all losses, claims, costs, or expenditures which may arise as a result of the Contractor's negligence in complying with the requirements of the regulations.

(c) It shall be assumed that the Contractor is conversant with the above-mentioned requirements. Should any requirement, by-law, or regulation, which contradicts the requirements of this Document, apply or become applicable during erection of the Installation, such requirement, by-law or regulation shall overrule this Document, and the Contractor shall immediately inform the Engineer of such a contradiction. Under no circumstances shall the Contractor carry out any variations to the installation in terms of such contradictions without obtaining the written permission to do so from the Engineer.

4. SITE CONDITIONS

Tenderers are advised to visit the site and acquaint themselves with all local conditions pertaining to the execution of the installation before tender closing date. No claims from the Contractor which may arise from insufficient knowledge of site access, type of site, labour conditions, establishment space, transport and loading/unloading facilities, power, and water supply, etc. will be considered after submission of tenders.

For services where prior permission is required before contractors can visit the site, a visit will be arranged for all interested parties.

5. ARRANGEMENTS WITH THE SUPPLY AUTHORITY

(a) The contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due to the local Supply Authority unless specified to the contrary.

(b) It shall be the responsibility of the Contractor to make the necessary arrangements with the local Supply Authority at his own cost and to supply the labour, equipment and means to inspect, test and commission the installation to the satisfaction of the Local and Supply Authorities.

(c) The Contractor shall supply and install all notices and warning signs that are required by the relevant laws, regulations and/or the Documents.

6. MATERIAL AND EQUIPMENT

(a) All material and equipment shall conform in respect of quality, manufacture, tests, and performance, with the requirements of the South African Bureau of Standards or where no such standards exist, with the relevant current Specification of the British Standards Institution.

(b) All material and equipment shall be of high quality and suitable for the conditions on site. These conditions shall include weather conditions as well as conditions under which materials are installed, stored, and used. Should the materials not be suitable for use under temporary site conditions then the Contractor shall at his own cost provide suitable protection until these unfavourable site conditions cease to exist.

(c) The Contractor shall, where requested to do so, submit samples of equipment and material to the Engineer for approval prior to installation. Samples may be retained in the Engineer's possession until the contract is completed after which they will be returned.

(d) The Contractor shall, allow and arrange for test inspections of any equipment in line with the requirements of the South African Bureau of Standards at the request of and witnessed by the Clients Representative.

Scope of Works

This specification relates to specific works and equipment required to supply, install and commission the following processing and operations systems:

Specifically, the installation of PN 16 Smart Meters & Smart Chambers will include but not limited to

- Replacement of 40 x Billing Meters, Chambers and Valves in Matjhabeng LM
- Replacement of 6 x Billing Meters, Chambers in Nala LM
- Modification 9 x Chambers to Smart Chambers
- Replacement of 9 x Flow Meter and LDS Flow Meters at Balkfontein and Virginia
- Replacement of 34 x Billing Meters, Chambers and Valves at the Mines
- Supply & Install WaMMS Scada System Web Based complete
- Training and licensing of software to Vaal Central Water Board

Requirements

a) Manufacturer's Certificate

On appointment the final selection and configuration of the pump sets must be submitted to the engineer together with detailed and complete installation requirements from the supplier of the pump set together with a method statement for the off-loading, storing, installation, alignment and dry- and wet commissioning. These must be approved by the pump supplier.

After installation and preceding the commissioning of the pump set on site, the pump supplier must visit the site and approve the installation and alignment of the pump in a document to the engineer. The engineer needs to be invited to this inspection together with the alignment of the pump and motor and the pump to the suction- and discharge pipework

Following wet commission of pump sets, the pump manufacturer or his approved supplier shall check the installation and when satisfied shall issue to the Engineer a certificate approving installation in compliance with manufacturer's specification.

Pipework and ancillaries

a) Pipe Fittings and Specials

The Contractor will be responsible for the design of pipe specials and fittings, with regard to pipe wall thickness and compensation flanges, as per drawings and pressure rating indicated.

Valve and Pipework

a) Gate Valves

All valves must be manufactured from mild steel. Gate valve on delivery side shall conform to the requirements of SANS 664. Unless otherwise specified the contractor shall supply wedge gate valve PN 25 (min) or as dictated by the service duty.

b) Butterfly Valves

Butterfly valves shall conform to BS 3952 for "cast iron butterfly valves for general purposes". The class and size of the valve shall be that dictated by the service duty. Test certificates shall be supplied with each valve. The body ends shall be flanged and drilled of centreline in accordance with SANS 1123:2015 Table 3 as per pressure rating specified in bill of quantities.

The gearbox shall not be an integral part of the main body, however the gearbox shall be a separate unit bolted to the main body in such a manner as to prevent any water leaking past the main shaft seal from entering the gearbox.

Valves shall be provided with hand wheels unless otherwise specified and all valves shall close by turning in a clockwise direction. Handwheels shall be clearly marked open and shut with arrow indicating direction of rotation.

c) Check Valves

Check valves shall be nozzle type check valves. The valves shall be suitable for horizontal or vertical mounting, of robust construction and shall close drop tight at the required operating head. The discs shall be either stainless steel or carbon steel with resilient seats and stainless-steel trim.

d) Air Valves

All air valves shall be Vent-O-Mat RBX with flanged connections. The air release and vacuum break valve shall be of the compact single chamber design with solid cylindrical HDPE control floats housed in a tubular stainless-steel body with epoxy powder coated mild steel or stainless-steel ends secured by means of stainless tie rods. The valve shall have an integral 'Anti-Shock' Orifice mechanism which shall operate automatically to limit transient pressure rise or shock induced by closure to 1.5 x valve rated working pressure. The intake orifice area shall be equal to the nominal size of the valve. The valve design shall incorporate an over pressure safety feature that will fail without an explosive effect, such as is normally the case when high compressed air released suddenly.
Air valves shall be supplied with a flanged isolation wedge gate valve, and with handwheel.

e) Flanges

The drilling of steel and CI flanges shall conform to the requirements of SANS 1123:2015 appropriate to the class of the pipe specified. Reaming of bolt holes to oversize dimension in order to make a particular piece fit will not be permitted. Flanged faces shall be machined overall with gramophone finish in accordance with SANS 1123:2015.

Loose flanges for welding onto steel pipes on site shall be manufactured from the same material specified for the pipes and shall be in accordance with SANS 1123:2015. All loose flanges shall

be suitable for field welding to pipes and specials and shall conform to API 1104 in respect of attachment.

All flanged connections on the suction side are to be in accordance with SANS 1123:2015 T1000/3. Flange connections on delivery side are to be in accordance with SANS 1123:2015 T2500/3.

f) Gasketing

Each flanged pipe and fitting shall be supplied complete with one insertion piece of the appropriate diameter and made of a material that is suitable for maximum working pressure, such as rubber for small diameter, low pressure lines or compressed fibres or other approved material for medium to large diameter and medium to high pressure lines.

g) Bolts and Nuts

One set of bolts and nuts to be supplied with each pipe fitting and pipe special. Bolts and nuts shall comply with relevant requirements of SANS 1700. All bolts, nuts and washers shall be hot dip galvanized and be of Grade 8.8.

Corrosion Protection

Scope

This specification covers the requirements for corrosion protection and painting of metal surfaces in pump stations, water treatment works and metal works in general.

Supporting Specifications

SABS 1200 HC: Corrosion protection of Structural Steelwork

Where this specification is required for a project, the above supporting specification shall also form a part of the Contract document.

All equipment, materials and fasteners installed under this contract shall be protected against rust, oxidization and corrosion by the application of an approved protective coating.

Such protective coatings shall be compatible with the materials applied to and shall at all times conform to the application instructions or recommendations of the manufacturer.

The appropriate and recommended primers shall be applied after de-scaling, cleaning, washing, drying or wiping as may be required and before finishing coats are applied.

Only the highest quality approved finishing, priming, etching and cleaning materials shall be used.

Interpretations

Grit blast cleaning: The directing of particles of abrasive steel shot or other grit against the surface to be coated. The grade of cleanliness shall be according to the Swedish Standard SIS 05 59 00.

Holiday: A defect in the coating where the coating has been damaged or is too thin

Holiday detector: An electrical device which electrically charges the item to be coated and senses and signals defects in the coating by means of an audible signal when passed over the coating.

Organic coatings:

i) Coal tar and asphaltic bitumen coatings
ii) Paint inclusive of epoxies, polyurethane, nylon and fusion bonded epoxy.
iii) Thermoplastic coatings such as polyethylene, nylon and fusion bonded epoxy.
iv) Tape wrap coatings
v) Film type coatings
vi) Miscellaneous coatings such as foams, etc.

FBE: Fusion bonded epoxy
GRC: Glass reinforced cement
HDPE: High density polyethylene
MS: Mild Steel
PVC: Polyvinyl chloride
Sa: Followed by a number refers to the Swedish Standard SIS 05 59 00
UV: Ultra-violet radiation

Design, Materials and Manufacture

Blast Cleaning

Grit for blast cleaning shall be in accordance with SABS 064 and/or BS 2451. Air used for blast cleaning will be free of oil and water.

Paints

General

Paints used for a coating system shall be mutually compatible. All paints supplied shall be in accordance with the SANS specification for their respective types and shall be of the best quality available.

Organic Coatings

The following basic requirements shall apply:

Durability: Supplied coatings to be chemically inert. This means it shall have constituents that are free from further oxidation, polymerization or saponification and maintain its properties for an indefinite period of time. All coatings to be resistant to biological degradation.

Moisture permeability: The coating is to be impermeable to the ingress of water and aggressive ions.

Mechanical damage: The coating should resist mechanical damage when an impact of at least 4 Joules at 20 ºC is applied as per ASTM G 14.

Conformability: All coatings to conform with the metal surface profile without causing voids, gaps, laminations and pinholes.

Application: The coating should be able to be applied easily under normal site conditions as known or as described in the Project Specification.

Repairs: Damage to coatings shall be easily repaired on site and conform to the specification after repair has been affected.

Adhesion: Coatings to have a high resistance to peeling. Adhesion shall not be less than 6N per square millimeter of steel. Suitable priming and surface preparation shall in all cases be carried out to improve adhesion.

Flexibility: The coating shall be flexible allowing elongation of 3% strain at 20ºC and 1% strain at -18ºC

Solvent free: Where practical, solvent free paints shall be applied.

Non-toxic and taste free: All internal linings/coatings for potable water shall be non-toxic, non-tasting and non-tainting.

Degreasing agent: Only water-soluble degreasing agents to be used.

Primers: The most suitable primer for the surface to be coated shall be selected in accordance with the manufacturer's recommendation.

Plant Handling

Plant and equipment used during the painting operation shall be such that no pipe, valve or pump casing are overstressed during any operations.

Surface preparation

The Contractor is to provide all equipment necessary for grit blasting and preparation of surfaces prior to painting.

Painting

The Contractor is to provide all necessary equipment for airless spray-painting, the application of epoxy coatings, sintered epoxy powder paints or other methods as specified. All paints to be applied in the contractor's workshop are to be applied by airless spray equipment, as FBE or approved. All site paintwork shall be to the Engineer's approval. The Contractor shall provide all required equipment and facilities required for inspection and testing purposes.

Colour

The final paint coat shall be of the colour as specified in the colour schedule attached to this specification.

Finishing and Painting

Finishing, painting and cleaning up the site are regarded as a part of the installation. After installation, all paintwork will be washed down with brushes and a suitable detergent to remove all grime and grease.

Corrosion Protection System

Fusion Bonded Epoxy (FBE) System

All corrosion protection of piping for this contract UNLESS SPECIFIED OTHERWISE shall have an inner and outer FBE coating in accordance with SANS 1217:201 Type 2A. The surface preparation shall be in accordance with SANS 12944-4.

- Degreasing and abrasive blast cleaning to Sa 3

Nuts, Bolts, Washers, etc

All carbon steel pipes, flanges, bolts, nuts, washers and other fasteners are to be galvanized according to SABS 763. All nuts to be tapped after galvanizing. Washers are to be fitted to both bolt head and nut. After installation, nuts, bolts and washers are to be treated with a self-etching primer and then painted together with the relevant items on which they are installed.

Tolerances

Film thickness tolerances

Individual coats:

A minimum of 90% of thicknesses measured shall comply with the system specification thickness.

Total DFT

No more than 10% of readings shall be less than the specified minimum thickness and no readings less than 90% of the specified minimum will be allowed.

Testing and Inspection

The Contractor remains fully responsible for the quality of the work done irrespective of any quality control testing done.

All datasheets, specifications and codes of practice for the materials used are to be made available by the Contractor.

Quality Control:

The Contractor shall carry out quality control testing and record the results of such testing to ensure compliance with the specification.

These records shall be made available for inspection by the Engineer or any other Third-Party Specialist Inspector appointed. Incomplete or inaccurate records shall be regarded as non-compliance with this specification.

Independent Quality Control:

The Engineer will be free to employ an independent inspector to monitor the quality of the Contractors work on his behalf. In the event of a dispute, the Engineer's ruling will be final.

Sampling:

The Engineer may at any time remove a reasonable number of samples of materials to be used in the coating application. In the case that analysis of a sample leads to rejection, all work using the same batch will be placed on hold. Rejection of a batch of work may lead to the reworking of all components coated with said batch.

Destructive Testing:

The Engineer may carry out destructive testing to ensure compliance. Damaged areas are to be repaired by the contractor at no extra cost to the satisfaction of the Engineer.

Test Methods to be Employed

Determination of cleanliness:	SABS 767 and ISO 8501-1
Determination of surface profile:	SABS 772
Free of dust and debris:	SABS 769
Dry Film Thickness:	SABS 141
Soluble salts test:	Weber Reilly reagent

Measurement and Payment

Corrosion protection and painting

Payment for corrosion protection and painting will be included in the rate for the items to be protected or painted.

The tendered amount shall include the cost of surface preparation, supply and application of corrosion protection systems/paint and the costs associated with the quality control. No separate payment will be made for site repairs to paintwork.

Training Requirement

The contractor shall provide supplier specific training to the employer/ operational staff on all critical equipment supplied under this contract. Detail of the proposed training and OEM training shall be provided. Training shall include:

- Stripping and assembly
- Training on the operation of the over system, and
- Training on maintenance manuals, maintenance procedures and all routine maintenance tasks,

A training program shall be submitted with this tender for the engineer's approval

Documentation Requirements

A comprehensive documentation pack in original Hardcopy and Electronic soft copy shall be provided for each mechanical system and major sub-components.
Documentation pack shall include GA drawings, technical manuals. Manufacturing / fabrication detail testing and validation Reports, QCP's, service procedures and repair manuals and full operating instructions

Spare Part Requirements

The Contractor shall identify a list of critical spare parts required for the continued operation of all mechanical equipment not only based on a reliability analysis of the equipment, but also on the reliability and availability of suppliers of spare parts in the region. All critical spares identified as part of the reliability analysis shall be identified, listed and priced by the Contractor. On the basis of the analysis the Contractor shall provide a priced list of spares which he recommends the employer should hold.

SECTION B.1

B.1 FASTENERS AND WELDING

1. GENERAL

1.1 Scope

1.1.1 This section covers the general standards for fasteners and welding used for the installation.

1.1.2 The following types of fastener installations are included:

(a) M12 and smaller bolts and nuts.

(b) Bolts and nuts above M12 in size.

(c) High tensile bolts.

(d) Washers

(e) Anchor fasteners

1.1.3 Welding may be installed as follows:

(a) Off-site welding of pre-assembled members

(b) On-site welding of permanent assemblies.

(c) Coupling of flanges and other static couplings

1.1.4 Where fasteners shall be of hexagonal head type, of grade 316SS or better in compliance with SANS 1700.

1.1.5 Where bolt threads shall not protrude more than 6 mm of the head of the nut unless otherwise approved by the Engineer in writing prior to installation.

1.1.6 Where anchor fasteners shall be of the chemical anchor fastening type, unless an alternative is approved by the Engineer in writing prior to installation.

1.1.7 Where anchoring of machinery by studs or bolts extending through supporting structure and nuts are required on one or both sides, the entire coupling and fittings shall be of grade 316 SS or better.

1.1.8 Where multiple layers of washers shall not be permitted.

2. FASTENERS AND WELDING SPECIFICATIONS

2.1 FASTENERS

2.1.1 M12 and Smaller

Fasteners of M12 in size and smaller shall be of grade 16 SS, or better.

2.1.2 Sizes above M12

All fasteners above M12 in size shall be hot dipped galvanised.

2.1.3 Washers

Washers shall be of similar material to the bolts and nuts. Spring washers shall be used for fastening arrangements that are subject to vibrations.

2.1.4 Anchor fasteners

Anchor fasteners shall be of the chemical anchor fastening or expanding type.

2.2 WELDING

Butt weld fittings shall be to ANSI B 16.9 and either meeting the schedule of piping or higher. Malleable cast iron fittings shall be to SANS 14. Flanges shall be welded to on in accordance with BS 806 type 6. Site welding shall be kept to a minimum and shall only be taken on written approval by the Engineer, prior to application. A hot works permits and working in confirmed spaces certificates shall be included within the safety file and approved by the OHS agent as prerequisite to the Engineers consideration. Zinc primer shall be applied to all damaged areas on hot dipped galvanised material and no white corrosion shall be accepted on site.

2.2.1 Continuous welding and elimination of crevices

Welding shall be continuous on all sides of every joint. All crevices shall be removed. Non-continuous welding shall only be applied only on written approval by the Engineer, prior to application.

2.2.2 Welding appearance

Welding shall be free of blowholes, projections, pinholes, splatter and undercuts. All welding flux shall be removed. All welding imperfections shall be grinded to within 2 mm and constant uniformity prior to finishing.

SECTION B.2

B.2 INSTALLATION OF VALVES

1. GENERAL SPECIFICATIONS FOR VALVES

All valves shall comply with the following general specifications:

(a) Valves shall be lubricated and greased to ensure long term reliability.
(b) Valves shall be double flanged.
(c) Valves and valve actuation shall be selected for operation under full pressure rating of valve and system.
(d) All valves shall be adequately demarcated and include indication of current position, opening and closing directions.
(e) Rising spindle valves shall be provided with spindle covers.

2. RESILIENT SEAL GATE VALVES

The valves shall comply with the following:
(a) The valves shall comply with SANS 664 or SANS 665.
(b) The valves shall be double flanged.
(c) Valves shall have rising spindles unless otherwise specified or necessary because of space restrictions. Non-rising spindle valves shall be fitted with indicators showing the valve opening position.
(d) Handwheels shall be of cast-iron.
(e) The spindle shall be of grade 316 SS, or better.
(f) Fixing lugs for end of travel limit switches shall be provided
(g) Handwheel size and construction shall permit easy opening of the gate when subjected to a differential pressure equal to the maximum operating pressure anticipated. Suitable gearboxes shall be fitted to provide easy opening when necessary. These gearboxes shall be grease filled.

3. KNIFE GATE VALVE

The valves shall comply with the following:
(a) Valves shall have cast iron bodies, stainless steel blades and cast handwheels.
(b) Valves shall be clockwise closing.
(c) Valves shall have chamfered blade edges and resilient body seals.
(d) Blade faces shall be surface ground or otherwise provided with two flat, parallel surfaces.
(e) The blade seal shall be protected by a non-metallic scraper or similar device.
(f) Suitable sealing shall be provided to prevent leakage from the valve, and it shall be possible to adjust these seals while the valve is in line under pressure.
(g) Valves shall be drop tight but need not be designed for bi-directional flow.
(h) Internal and external surfaces of the valve body shall be protected with a water resistant, non-toxic and non-tainting fusion bonded epoxy.

(i) Valves shall be double-flanged and shall suit the standard flange rating but may incorporate drilled and tapped fastener holes (wafer type valves will be considered for acceptance only where it is unlikely that the pipe or flanged item on either side will have to be removed or if isolation will not be necessary if it is removed). Fasteners may be studs or setscrews manufactured to suit the tapping depth.

4. BALL CHECK VALVES

AVK Series 53 or similar ball check valves shall be considered for this project. The ball shall be rubber coated and it shall be possible to inspect and/or replace it without removing the valve from the pipe work. The valve shall be of the double flange type, sized to meet the full flow requirements of the system and suitable for continuous use as well as reliability and use after long periods of stagnation.

5. PRESSURE RELIEF VALVES

All valves shall be provided with handwheels for manual operation closing in the clockwise direction. Omission of handwheels shall only be permitted on written confirmation by the Engineer, prior to procurement. A thick protective layer of a corrosion inhibitor shall be applied to the actuator shaft prior to any greasing or lubrication.

6. VALVE ACTUATOR

All valves shall be provided with handwheels for manual operation closing in the clockwise direction. Omission of handwheels shall only be permitted on written confirmation by the Engineer, prior to procurement. A thick protective layer of a corrosion inhibitor shall be applied to the actuator shaft prior to any greasing or lubrication.

SECTION B.5

B.5 PIPE WORKS

1. STEEL PIPES

Mild steel pipes are used, they shall be of non-corrosive, hot-dip galvanised material. DN 150 and lower shall comply to SANS 62 medium class and sizes above DN 150 shall comply with SANS 719.

2. CAST IRON PIPES

Where cast iron pipes are used, they shall comply with BS 2035 (Class D) and shall be pressure tested in accordance of clause 12 of that standard. Pipes shall be free from defects and casting appearance and clauses 8, 9 and 10 for casting accuracy.

3. ENCASED PIPING

All pipes encased in concrete shall be short, straight length pipes, flanged on both ends with adequate clearance between the pipe flanges and the encasement walls to allow for access for removal and fitment. Pipes encased below water level shall be provided with puddle flanges. The encased area shall be uncoated up to 30 mm inside the wall surface.

4. PIPE APPEARANCE

Pipes and fittings shall be conservatively selected to suit the application, neatly installed, straight to line and level, adequately supported and shall operate without vibration.

5. VALVE ORIENTATION

Check valves shall be preferably installed along the horizontal axis and isolating valves along the vertical axis. Handwheels shall be orientated for ease of access.

6. PIPE SUPPORTS

(a) Steel supports shall be fabricated from heavy duty hot-rolled steel sections and hot-dip galvanised.
(b) Welds shall be all-round.
(c) Each foot shall feature at least four anchor fasteners.
(d) Cantilever pipe supports shall be between anchor fasteners with a span not exceeding a third of the cantilevered pipe length. Generally, pipe supports shall be provided for maximum spans of 2.5 m for pipes sizes up to DN 100, 3.5 m for pipe sizes up to DN 250 and 5.0 m for larger pipes.
(e) Pipe supports shall be located in a manner that allows for continuous support when a fastened component is removed from the installation.

(f)
(g) Neoprene strips shall be placed between pipes and supports to limit corrosion.

7. PRESSURE TESTING

Assembled pipelines shall be tested to a pressure of 1.5 times the maximum working pressure. The maximum working pressure assumed shall be as defined by SANS 10252.

8. SUCTION PIPELINE

(a) Suction pipework shall be sized to limit the flow velocity to 1.5 m/s.
(b) Pipes shall preferably slope towards the pump.
(c) Air-leaks shall be prevented.
(d) Air leaks shall be prevented.
(e) Reducers shall be of the unequal type, with the diametral reduction at a ratio not exceeding 50 mm/300 mm of length.

SECTION B.6

B.6 INSTALLATION OF FLANGES

1. GENERAL

Flanges shall comply with SANS 1123. Cast iron flanges and their mates shall be machined to provide a flat mating surface. Drilling and installation

2. FLANGE FIXING

Flanges shall be welded on in accordance with BS 806 Type 6. Alternative forms of flange fitment shall be presented to the Engineer for written approval, prior to installation.

3. MACHINING OF FLANGES

All flanges shall be machined on the sealing face. Flanges cut from plate shall also be machined on the bore and outside diameter. Cast iron flanges shall also be machined or spot faced on the back of the flange to ensure a flat bearing surface for the fastener's head or nut and washer. All edges, including bolt-holes, shall be chamfered or rounded to a 2 mm radius.

4. GASKETS

3 mm rubber gaskets shall be utilised for coupling flanges.

SECTION B.12

DRAWINGS

These clauses are relevant to the mechanical installations.

1. Engineering Drawings

Drawings shall be read and understood in sufficient detail to understand the Scope of the Works required to be performed. If there are areas that appear unclear or if the Contractor deems there to be material errors in the design, he/she shall bring it to the immediate attention of the Employer prior to the closer of tenders. The Contractor shall be required to address in writing any clarifications the Contractor may require in understanding the tender document and drawings, such that he/she may sufficiently price the document to complete all of the specified Works.

Copies of Engineers' drawings may not be used by the contractor for purposes of producing working drawings without the permission of the Engineer.

The drawings shall be read in conjunction with relevant drawings from other disciplines.

2. Contractor's Responsibility

The contractor shall produce, at his own expense, all required drawings for the execution of the contract works, including any additional details that may be requested by the engineer.

Verification that the positioning or location of equipment, opening sleeves, penetrations, ducting, piping, etc. do not clash with other services is the responsibility of the contractor.

The contractor is responsible for correct field dimensions, clearances, heights, quantities, fabrication processes, techniques of construction and co-ordination of their work with that of all other trades and is to provide all devices necessary for safe and satisfactory operation.

3. Standards

General arrangement, installation and layout drawings will be prepared to a scale of 1:50.
Enlarged details prepared for clarification shall be drawn to a scale of 1:20 or 1:10.
The smallest drawing sheet size consistent with clarity and un-ambiguity selected from the following shall be used: A0 / A1 / A3.

4. Approval

The contractor shall not issue any original or revised drawings, to any parties, for information, manufacture, installation or for any other reason, unless such drawing has been checked by and stamped with the Engineer's mark of approval.

The Engineer will check drawings for correctness and compliance with design only. Physical sizes and correct location of equipment and components shall remain the responsibility of the contractor.

Corrections or comments made on drawings by the Engineer do not imply a change in the "Scope of Work". The contractor shall inform the Engineer immediately, in writing, prior to modifications to the original drawings, whether in his opinion such corrections and comments will result in a change to the "Scope of Work".

Three (3) prints of each drawing submitted for approval are required. The corrected print will be returned to the contractor and shall be dealt with in accordance with the Engineer's stamped requirements.

SECTION B.13

B.13 INSPECTIONS, TESTING, COMMISSIONING AND HANDING OVER

1. PHYSICAL INSPECTION PROCEDURE

1.1 Once the Contractor has completed the installation, written notice shall be given to the Engineer in order that a mutually acceptable date can be arranged for a joint inspection.

1.2 During the course of the inspection, the Engineer will compile a list of items (if any) requiring further attention. A copy of this list will be provided to the Contractor who will have a period of 7 days in which to rectify the offending items of the installation.

1.3 The Contractor shall then provide written notice that he is ready for an inspection of the remedial work to the offending items.

1.4 This procedure will continue until the entire installation has been correctly completed to the satisfaction of the Engineer.

2. TESTING AND OPERATIONAL INSPECTION PROCEDURE

2.1 In addition to the above the Contractor shall have the complete installation tested and approved by the local authorities where applicable.

2.2 Subsequent to the above testing and approval, the Contractor shall in the presence of the Engineer test all pipe assemblies with respect to:

(a) Pipe Assembly Integrity

(b) Pump Controls Autonomy

(c) Manual Operation and Safety Overrides

(d) Meter Pressure Test

(e) Meter Rotational Speed Test

3. "AS BUILT" DRAWINGS

3.1 As each portion of the work is completed, the Contractor shall provide the Engineer with as-built drawings showing the exact location measured from fixed points of all mechanical installation

3.2 In addition a complete reticulation diagram showing all motor control circuits and pump schematics.

3.3 The installation will not be regarded as complete until all of the above requirements listed in 1, 2 and 3 above have been met.

PARTICULAR SPECIFICATIONS - ELECTRICAL CONTROL AND INSTRUMENTATION

SECTION 1: GENERAL OVERVIEW AND SYSTEM DESCRIPTION

This section of the specification shall be read as an amplification of the previous sections with particular reference to the project being tendered upon. In all cases the installation standards detailed in Section IV shall be adhered to unless specifically mentioned to the contrary in this section.

1. INTRODUCTION

The contract comprises the complete installation and replacement of smart water meters, smart chambers and Valves that is in within Vaal Central Waters' Northern Free State Region which is situated in the Free State Province.

2. SYSTEM ELEMENTS

The work covered by this contract comprises the complete preparation of the Balkfontein WTW to receive emergency influent whilst awaiting scheduled process refurbishment, in working order, as shown on the drawings. The extent of the work could be summarized as follows;

- Replacement of 40 x Billing Smart Magflo Meter Isomag WaMSS Scada Web Based with built-in transmission, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device and Valves in Matjhabeng LM
- Replacement of 6 x Billing Meters, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device in Nala LM
- Modification 9 x Chambers to Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device
- Replacement of 9 x Flow Meter and LDS Flow Meters at Balkfontein and Virginia
- Replacement of 34 x Billing Smart Magflo Meter Isomag WaMSS Scada Web Based with built-in transmission, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device, Smartlock Chamber RHI Node 1000 MD STD Glam + Side Panel expansion kit & NBIOT standard sense device and Valves at the Mines
- Supply & Install WaMMS Scada System Web Based complete
- Training and licensing of software to Vaal Central Water Board

The Contractor shall issue all notices and make the necessary arrangements with Supply Authorities, the Postmaster-General, S.A. Transport Services, Provincial or National Road Authorities and other authorities as may be required with respect to the installation.

The Contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due to the local Authority.

On production of the official account, only the net amount of the fee charged by the Authority for connection and/or inspection shall be refunded to the Contractor by the Client.

QUALITY OF MATERIALS

Only new materials of first-class quality shall be used, and all materials shall be subject to the approval of the Engineer and Client. The specifications for various materials to be used on this Contract are attached to and form part of this specification.

Wherever applicable the material is to comply with the relevant South African Bureau of Standards, specifications, or to British Standard Specifications, where no SABS Specifications exist.

Materials wherever possible, must be of South African manufacture and origin.

All equipment and fittings supplied must be in accordance with the attached quality specification (Section 4 Part A of this document), suitable for the relevant supply voltage, and frequency and must be approved by the Engineer's representative.

DRAWINGS

The drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed. The position of pipe points, distribution boxes and manholes that may be influenced by built-in furniture must be established on site, **prior to these items being built in.**

EXCAVATIONS

General

Trenches are to be as narrow as possible consistent with the working space required and should not normally be wider than 1.0 metres where only one pipe of 400 mm ND is to be laid in a trench. Surface material and any hard core is to be stored separately for replacing last when the trenches are backfilled, and any large stones are to be separated from the remainder of the excavated material so that generally soft fill is available for backfilling immediately on top of the cable.

Care is to be exercised in excavation to ensure the minimum of damage to the surrounding surfaces and to the buildings, kerbs and paving stones, gates, and fence foundations etc.

Depth of Trenches

Trenches are to be as smooth as possible along the bottom with no sharp rocks etc., projecting up into the trench and the minimum of depth to which the trenches are to be excavated are as illustrated in the drawings.

Building Area

No cables shall be buried direct in the ground within buildings or concrete covered areas.

Method of Excavation

The contractor is to advise the Engineer, or his appointed representative of the type of equipment and methods proposed to be employed for the excavation of trenches, cable laying, back-filling, and reinstating of material removed for the trenches. Written approval must be obtained on this before work commences.

Pipe Laying

On completion of the whole or any agreed parts (where the work is to be carried out in stages) of the excavation, and the installation of any necessary pipes, trench bottoms are to be covered with sifted soil or sand is to be free of any organic matter or acidic impurities.

Concrete Pipe Tiles

Pipes shall be protected by installation of reinforced concrete interlocking tiles, but only in those sections of the routes which are considered to be particularly prone to excavations or similar hazards.

Backfilling

When pipes are in position in the trenches, an inspection will be required by the Resident Engineer before backfilling commences. The first stage of backfilling is to be sifted soil or sand (as specified for the trench bottom) with cover being provided to 100 mm over the pipe. Soft excavated material free of stones is then backfilled, with the backfill compacted every 150 mm to at least 90 % Mod AASHTO.

Small stones extracted materials may be mixed in with the backfill in the final stages, but large stones are to be removed from site. Surface material and any hard core removed prior to excavation is to be backfilled and well compacted to restore the surface as near as possible to the original conditions.

Excess backfill is to be removed from site. The contractor is responsible for reinstating any damage to gates, hedges, kerb stones, concrete, etc. and normally for the surface of any privately-owned made-up roads. For public roads, reinstatement of made-up road surfaces will be carried out by the roads authority and the trench backfill must be left in a suitable condition as required by the road authority.

Route Markers

Approved surface route markers shall be situated at all joints, bends and at maximum intervals of 30 m on straight runs. Whenever the pipes change direction markers shall also be placed so that the change in direction is readily seen.

Measurement of Excavations

The pricing of excavations in the Schedules shall be for excavation in "earth". The contractor shall submit extra rates for excavation in "hard pickable" soil and in "rock". The terms "earth", "hard pickable" and "rock" shall be interpreted as follows:

a) EARTH

The term "earth" shall mean all naturally occurring materials (other than "hard pickable" and rock" as hereinafter defined), soft, shale, schist, vegetable soil, made-up ground, rubbish, etc., and shall include small boulders not 0.25 m^3 in volume.

b) HARD PICKABLE

The term "pickable" shall mean all material which can be broken by mechanical means but not including "rock" as hereinafter defined.

c) ROCK

The term "rock" shall mean all material which can only be broken by drilling, blasting, welding, barraging or plugs and feather, heat and all individual boulders exceeding 0.25 m^3 in volume. **No excavations shall be deemed to be in "hard pickable" or "Rock" unless certified by the Engineer or his appointed representative.**

d) POLE HOLES

The contractor shall obtain approval from the Engineer prior to commencement of excavation of pole and stay holes. Care is to be exercised in excavation to ensure that the minimum of damage is done to the surrounding surfaces and to buildings, kerbs, paving stones, gates, and fence foundations, etc.

e) TREE FELLING

On cleaning the ground level, the contractor shall obtain prior approval from the Engineer before any trees are removed or branches cut.

f) DEPTH OF HOLES

The 2100 mm long poles and stay plates shall be buried 300 mm deep into the ground and shall be excavated with as little disturbance as possible to the surrounding ground especially in the direction transverse to the line.

g) METHOD

The contractor shall ensure that the pole holes are not over excavated. When reinstating the holes the contractor shall backfill the holes with 250 mm layers of well-compacted soil, suitable to provide support for the poles in an upright position.

h) PRECAUTIONS

All open excavations shall be suitably marked and cordoned-off, and the contractor shall provide "Red Lanterns" for warning at night.

i) CERTIFICATION

No excavation shall be deemed to be hard packable or rock unless certified by the Engineers representative or the Engineer.

(1) SUPERVISION

The Contractor is to ensure that adequate notice is provided to ensure that a member of the Engineer's staff will fully be present during the period of work and particularly during the pulling out and laying of cables.

(2) TOOLS, EQUIPMENT AND LABOUR

All pipe jacking equipment, all tools and approved equipment, and all labour for the installation of pipes is to be provided by the Contractor.

3. MV SWITCHGEAR

3.1 The switchgear will be Schneider Premset series fixed-pattern switchgear
3.2 Switchgear protection should be suitable for supply to motors via variable speed drives.

4. MV VARIABLE SPEED DRIVES

4.1 All pumps will be fitted with 3.3 KV variable speed drives (Schneider, Allen-Bradley or similar), rated to the motor sizes for the applicable pump stations.
4.2 The drives will be standalone units but will be locally integrated to each other via a local PLC system.
4.3 Costing must include commissioning by Certified and approved personnel.
4.4 Costing must make provision for attendance of a FAT of at least one unit at the manufacturer’s premises.

5. PLC AND SCADA SYSTEM

5.1 The PLC (Schneider M340, Allen-Bradley Compact logix or similar) will form the backbone of the control system.
5.2 PLC Systems and SCADA will be linked via fiber-optic backbone.
5.3 SCADA system will be the Adroit Smart Scada package.
5.4 PLC’s will interface to VSD’s at plant level via Modbus TCP, Modbus RTU of Ethernet I/P
5.5 Control Level Communication (Between PLC’s and SCADA) will be Ethernet based.
5.6 Main SCADA installation will be at MLM Welkom Head offices

5.8 A local Local HMI will be installed on the PLC panel at each Pump Station, with a further remote HMI installed in a location easily accessible to operational personnel.

6. COMMUNICATION BACKBONE

The system makes provision for the PLC communication system, as well as for the installation of a VOIP telephone system and CCTV system to monitor the remote locations.

7. BALKFONTEIN WTW

The stopping/starting of the pumps are controlled by the level of the raw water sump at the relevant sumps. The following forms part of the project:

7.1 Construction of a new MV room being part of the proposed staff offices
7.2 A new set of 3.3 KV Premset switchgear will be installed.
7.3 Three new Variable Speed Drives will be installed in the new MV Room.
7.4 The proposed staff offices building will be utilized for the LV and Control Room.
7.5 A PLC Control system, interfaced to the VSD's to be installed in the LV room.
7.6 The PLC panel will include a 10" HMI for local control and monitoring of the system.
7.7 A new LV Distribution Board to be installed in the LV Room.
7.8 Pump Instrumentation, via Pump Instrumentation Junction Boxes, to include the following:
    a. Delivery Pressure Transmitters
    b. Pump no-flow switch (delivery side of each pump)
    c. Vibration Transducers (2 x pump, 1 x motor)
    d. Bearing Temperature (2 x pumps, 2 x motors)
    e. Motor Winding Temperatures
    f. Monitoring and control of inlet/delivery actuators of each pump
7.9 Open Channel Flow meter on the anaerobic pond distribution box
7.10 Level Sensors (each sump to have one)
7.11 Monitoring of pond delivery valve selections via limit switches on valves.
7.12 Monitoring of existing station flow meter
7.13 Monitoring of station delivery pressure on outgoing line
7.14 A remote HMI will be installed in the pump room for local control/monitoring.
7.15 Linked to overall system via fibre-optic.
7.16 A VOIP telephone to be installed.
7.17 CCTV Cameras to be installed for monitoring of the station.

7.18 Servicing of two local services 3.3 KV/400V 160 KVA transformer and standby generator.

SECTION 2: GENERAL SPECIFICATION

1. INTRODUCTION

As described in Section 1, the project involves the INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION , integrated system, offering comprehensive monitoring and control of the system. The electrical works required is described in detail within this document, the associated electrical diagrams and Bill of Quantities.

This Project Specification is not intended to specify the exact and final details of design and construction of the medium voltage switchgear, 400 V equipment, cables and control equipment. The drawings depicting power- and controls are issued for tender purposes only and do not necessarily indicate the final design or the functioning of the equipment required by the Employer. The specification and drawings do, however, depict the basic requirements and the layout and positions of all the required equipment.
The Schedule of Quantities contain the proposed materials measured at tender design stage of the Contract and cannot be regarded as the full and final quantities of material for this Contract. The main offer of a tenderer must comply with the specification requirements of this Contract. No alternative equipment will be accepted unless specifically approved by the Employer or Employer's representative. A list of specific equipment requirements is included in this document. The correct functioning of the system, using equipment supplied and installed under this contract, will remain the responsibility of the Supplier of the equipment and/or the Contractor for this Contract.

All Technical Data Schedules and the Schedules of Quantities shall be completed in full. The Contractor shall submit shop drawings, details, general arrangement and equipment layouts, complete with overall dimensions, weights and finishes of the equipment offered by him within a period as agreed with the Employer, but prior to placing any orders or commencing with work or installations. The Contractor's manufacturing drawings and data must be approved in principal and/or in detail by the Employer or his appointed Representative before manufacture of any equipment may proceed.

The scope of work includes the design, selection, manufacture, supply, testing in factories, care and storage in the factories, delivery to site, off-loading on site, assembly and installation on site, connections, testing on site, "dry" commissioning and "wet" commissioning of the electrical works and equipment and handing over in working order of the complete electrical works as specified herein.
The scope of works also includes maintenance for twelve (12) months and insurance against lightning and other damage of the total installation for twelve (12) months from first handover.

The works can be summarized as follows:

1. The design, manufacture, supply, works testing, delivery, off-loading, site erection, connections, site testing, commissioning and handing over of indoor mounted 3.3 KV switchgear as indicated.
2. The design, manufacture, supply, works testing, delivery, off-loading, site erection, connections, site testing, commissioning and handing over of all equipment as indicated on the single line diagrams.
3. The design, manufacture, supply, works testing, delivery, off-loading, site erection, connections, site testing, commissioning and handing over 3.3 KV Variable Speed Drives as indicated.
4. The supply, installation and testing of all MV cable work, joints and terminations related to the installation. The work shall include megger testing and pressure testing of MV cables, as applicable.
5. The supply, installation and testing of 400 V cable work and cable ends for sub-main feeders and other connections including megger testing as applicable.
6. The design, manufacture, supply, works testing, delivery, off-loading, site erection, connections, site testing, commissioning and handing over of all distribution and instrumentation cubicles as required.
7. The design, manufacture, supply, works testing, delivery, off-loading, site erection, connections, site testing, commissioning and handing over of all the 400 V / 230 V motor control centers, distribution boards and control device panels.
8. The supply and installation of earthing and lightning protection systems and additional earthing as may be required by the Employer's representative.
9. The manufacture, supply, delivery, off-loading, site erection, and handing over as a completed installation of cable ladders and ladder supports, ducting, junction boxes, fixing brackets, cable ties, etc.
10. The supply, delivery, off-loading, site erection, and handing over as a completed installation of all instrumentation as specified.
11. Assistance to other Contractors during the commissioning period of the pump sets and works.
12. Danger signs and notices in terms of OHS Act and Mine Regulations at all substation- and LV rooms.
13. The design, supply and installation of all equipment applicable to the already installed fiber-optic backbone to ensure the establishment of a secure, dependable communication backbone between all locations as indicated.
14. The design, supply and installation of a security camera system and telephone backbone as indicated.
15. The planning, design, supply and installation of comprehensive integrated control system for the project, including the supply, installation and configuration of a SCADA system at the Balkfontein Water Treatment Works Control Room.

The contractor shall be deemed to have carefully examined all the constituent parts of this document and all other documentation issued to him/her before the Tender or quotation was submitted. Any doubts as to the meaning of any terms, phrases or clauses of the document or any other document, or any missing pages, shall be submitted to the Employer's representative in writing before a Tender is submitted. No claims traceable to non-compliance with this requirement will be considered after the closing date of Tenders. If it is found at any stage of a Contract that the Contractor has deviated from the requirements of this document without the written consent of the Employer's representative, then the Employer's representative shall have the right to order the Contractor to carry out the actions required by this document without any adjustment in the Contract price.

2. SPECIFIC REQUIREMENTS OF THIS CONTRACT

Certain general and specific requirements are applicable to all the sections of the Contract specified hereinafter and Tenderer's must ensure that the price submitted for each portion of the Contract (i.e. MV switchgear, LV switchgear, Variable Speed Drives, MV cables, LV cables, transformers, 400 V/230 V lighting and power point installation and cables) allow for all the materials and requirements of each portion as well as for the following general requirements:

1. All MV cable ends be made off by an accredited MV cable jointer.
2. All control- and protection equipment settings on the MV and LV switchgear be done by the suppliers of such equipment, in the presence of the Employer's Representative.
3. Contractors or suppliers of the MV switchgear shall obtain the upstream overload and trip settings from ESKOM and shall calculate and set the protection relays on MV switchgear to ensure downstream grading of protection to inhibit random tripping.
4. Tenderers shall fill in the Schedule of Technical Data bound into this document to indicate the type, manufacture and quality of equipment offered by them in their main offer for the project. Non-completion of the schedules will be seen as non-responsive and may cause invalidation and subsequent rejection of the Tender.
5. The Contractor shall confirm the lengths of cables and cable ladders on site and shall discuss this with the Employer's representative before ordering as only measured installed lengths will be paid for. Any allowance for off-cuts shall be made in the unit rates. The final measurements shall be based on the net route length of cables and racks concerned.

6. The quantities set out in the Schedules of Quantities for small items of equipment or cable (where applicable) are approximate only and do not necessarily represent the actual amount of work to be done. Items will be re-measured based on site-installation.
7. The design and manufacture of equipment and the complete installation shall be carried out and tested in accordance with the latest issue or amendments of the following Regulations, as applicable:
   - SANS 10142 – The Code of Practice for wiring of premises as amended;
   - The Occupational, Health and Safety Act, (Act 85 of 1993);

- The local Municipal by-laws and Regulations and Regulations of the local supply authority;
- The Fire Brigade Services Act, 2000 (Act 14 of 2000);
- The Regulations of Telkom (S.A.) Ltd;
- The National Building Regulations and Building Standards Act, (Act 29 of 1996); and
- The Electricity Act, (Act 88 of 1996);
- The Standard Specification for LV Work up to 1 KV.

8. The Contractor shall issue the necessary completion certificates and Certificate of Compliancy to the Employer's Representative and the applicable Authorities as contained in SANS 10142: Part 1: Low Voltage Installations, or as required in terms of the Occupational Health and Safety Act, Act 85 of 1993, upon completion and after commissioning of all electrical work. The Contractor shall issue the necessary "cold Commissioning" Certificate of Compliancy to ESKOM if ESKOM requires this document for switching on their supply.
9. The Contractor shall be fully responsible for the security of his own equipment and the insurance of all the equipment specified herein until the handing-over of the completed operating works to the Employer.
10. Cranage will not be provided by the Employer. Contractors must allow for all crane requirements and must include this cost in their overall cost structure, as a separate pricing item is not available in the Schedule of Quantities for such items.
11. The Tender Drawings issued with this Tender Documentation are detailed and sufficient for the purpose of tendering, construction and ordering of materials. The work forming this Contract is shown on the Tender drawings. Equipment and small power layout drawings will be issued to the successful Contractor. Such Drawings will be issued with due consideration of the program of manufacture and construction and after due consultation with the Contractor. The Contractor shall indicate the lead times for critical Drawings after due consultation with the Employer's Representative.

3. GENERAL SYSTEM OPERATION

The overall control philosophy is to establish a plant system that will be able to run unmanned after completion and commissioning and will be controlled and monitored from the Plant Control Scada Desks. It is therefore essential to install instrumentation and controls to provide dependable and continuous operation of the switchgear and controls. The following modes of operation can be accepted for tender purposes:

1. Manual Mode: In manual mode the station control equipment shall be suitable to operate the station from the PLC HMI's at the pump control consoles and/or from the SCADA computers in the control rooms. The manual control equipment shall also have the facilities to test the pump sets by using the local manual control of the control valves on the pump lines in conjunction with the Local Control Modes on the HMI's, SCADA and equipment.

2. Automatic Mode: In this mode, operation of pumps will be based on the levels of the various reservoirs and sumps, with pumps stopping and starting to maintain levels as set from the SCADA system. The automatic duty-cycling of pumps and starting of standby-pumps, as required, forms part of this mode of operation. To enable the above modes, the suction- and delivery valve actuators must have local facilities to OPEN or CLOSE these valves for testing or maintenance purposes but must have the ability to be remote controlled by the SCADA control system.

4. PLC CONTROL EQUIPMENT AND COMMUNICATION BACKBONE

The PLC's, PLC HMI's and SCADA computers and the software thereof as well as the fibre-optic equipment forms part of this Contract. The communication backbone will be an Ethernet system based on the use of an 8-fibre single-mode fibre-optic cable already installed under a separate contract. All ancillary equipment required to establish the communication network form part of this contract.

All PLC and Remote I/O equipment will be installed in cabinets and MCC's as per the attached electrical diagrams and will be placed in the locations as indicated. All the field- and instrumentation control cables must be terminated in the control consoles and specified junction boxes as indicated on the diagrams. The control equipment to be used is as indicated on the detailed electrical diagrams. Deviations from this will only be allowed with the express, written approval of the employer or his representative.

5. MEDIUM VOLTAGE CABLES AND CABLE-ENDS

All MV cables supplied and installed under this contract will be cross-linked polyethylene (XLPE)-insulated cable with stranded copper conductors complying with the requirements of SANS 1339 and NRS013: 1991, The following standards must also be taking into account:

Electric cables - Cross-linked polyethylene (XLPE)-insulated electric cables for rated voltages 3,8 kV/6,6 kV to 19 kV / 33 kV (excluding pressure assisted cables): SANS 1339 (2001)
Materials of insulated electric cables and flexible cords: Part 4: Cross-linked polyethylene (XLPE): SANS 1411-4 (2001)
Materials of insulated electric cables and flexible cords: Part: Polyethylene (PE): SANS 1411-7 (2003) Test methods for cross-linked polyethylene (XLPE) insulated electric cables: Parts 1-4: Tests on XLPE insulation: SANS 6284-4 (1999)
All medium voltage XLPE cable ends shall be of heat shrinkable type materials and shall comply with SANS 1411-4 and SANS 1141-7. Sufficient slack shall be left on cable ends so as not to exert any strain on cable tails, cable ladders, gland plates, switchgear connections, bushings, etc. Ends shall be properly made off and steps shall be taken to avoid corona damage over a long period of time. The ends of cables which are cut and not made off within sixty (60) minutes shall immediately be sealed by means of heat shrink caps.

Where cable ends have been left open for twenty-four (24) hours or more, the cable ends shall be tested for moisture ingress. Please note that the person responsible for making off the cable ends shall be an accredited cable jointer. Accreditation certificates in support of this must be submitted to the Employer's Representative for approval prior to any work commencing. All connections to the points of supply by ESKOM must be made in cooperation with ESKOM. Type test certificates of the joints and terminations must be available if requested.

6. 3.3 KV MV SWITCHGEAR

As a result of space and other related constraints, the switchgear to be supplied under this contract will be the Premset series of equipment. The pricing must include for the design, manufacture, supply, works testing, delivery, off-loading, site erection, connections, site testing, commissioning and handing over of the switchgear. These switchgear panels are suitable for indoor use with all power, control and communication cable entries from the front or bottom. The contractor may, as a separate offer, submit alternative switchgear with similar form-factor and rating as the Premset series.

Switchgear shall comply with the general requirements set out in this document, as well as with the requirements of the following standards:

Graphical symbols for electrical diagrams: NRS 002 (2000).
Semi-conducting screens: SANS 6284-4 (1999)
International electro-technical vocabulary Chapter 441: Switchgear, control gear and fuses: SANS 60050 (441) (1984).
Standard voltages, currents and insulation levels for electricity supply: SANS 1019 (2001).
Metal-clad switchgear for rated AC voltages above 1 kV and up to and including 36 kV- General requirements and methods of test: SANS 1885 (2001), IEC 17025.
High-voltage switches Part 1: Switches for rated voltages above 1 kV and less than 52 kV: SANS 60265-1 (1998).
High-voltage switchgear and control gear Part 100: High-voltage alternating-current circuit-breakers: SANS 62271-100 and SANS 62271-200.
Metal-clad switchgear - For rated AC voltages above 1 kV and up to and including 24 kV - Preferred requirements for indoor applications in the electricity supply industry Part 2: Standardized panels: NRS 003-2 (1993).
Electrical power, switchgear and associated equipment- operating conditions: IEC 60694
Specification and acceptance on Sulphur Hexa Fluoride (SF6): IEC 60376
Isolators and earthing switches: NRS031, IEC 60129, IEC60271-102
Current Transformers: IEC 60044-2

Floor tolerances of the substation floors cannot be guaranteed to the standard of finish of 1 mm/1000 mm required. Tenderers must therefore make allowance in their tenders for methods to overcome the tolerances normally obtained with self-levelling screeds.

Circuit breakers shall be complete with sufficient auxiliary contacts for monitoring and control purposes. Allowance must be made for opening/closing switchgear from the PLC system and all required opening/closing coils must be installed in this regard.

All the circuit breaker and feeder panels shall be equipped with electronic protection relays suitable for incomer, bus-bar, motor- or feeder protection as the case may be for the particular switchgear panel. All relays shall be equipped with I/O cards and with MODBUS, Ethernet or similar communication ports. All terminals shall be properly marked and the labels and markings shall correspond with the numbers on the drawings of the manufacturer. Power monitor equipment shall be installed on incoming circuit breakers and will have communication facilities to communicate via MODBUS, Ethernet or similar communication protocols to the PLC system.

Switchgear panels shall be equipped with earthing switches which shall be interlocked with circuit breakers or fuse/contactor units to enable the making safe of outgoing feeder cables for maintenance purposes.
The switchgear manufacturer shall be responsible for the correct installation of the switchgear on site as well as the relevant testing and commissioning and handing over thereof. All testing in the factory and on site must be witnessed by the Employer’s representative. Over current and earth fault tests must be simulated during the factory inspection to demonstrate the protection grading of the relays. On completion of manufacture of switchgear, the following tests shall be conducted at the manufacturers' works:

1. An operational test on all circuit breaker operating mechanisms, including the checking of mechanical interlocking, spring charging mechanisms and all opening and closing systems.
2. A primary injection test at no less than full rated current to verify the tripping times of and operation of all over current, earth fault and other protection relays. This test shall also verify the current transformer rations and polarity
3. A primary injection and voltage test on all metering circuits to ensure the correct connection and operation of all power meters and verify the current transformer ratios and polarity
4. Primary current injection tests shall be made on all power circuits containing CT's to check ammeters, and calibration of relays. During the overload and earth leakage tests, the circuit breaker shall be closed to confirm tripping of the circuit breaker under fault conditions
5. The testing and checking of all indication lamp circuits and the operation of lamp test and associated circuits
6. The testing of all alarms circuits and feedback contacts
7. High voltage pressure tests on the equipment between phases and between phases and earth such that all combinations are fully tested
8. Test all auxiliary relays for correct operation
9. Test all trip, close and control circuits for correct operation

10. Tests on site shall be the tests specified for each item of plant in the relevant British or other approved Standards and the tests shall be conducted in accordance with this specification. The Contractor shall provide all equipment and personnel required to carry out the tests, including provision, installation and removal of all test instruments, the connection and disconnection of plant items and obtaining of all records. The Contractor shall prepare and submit to the Employer's representative, prior to the commencement of testing, schedules in approved format for each test together with a program for the Tests on Completion. The Employer's representative will be responsible for overall co-ordination and safety control of tests. The Contractor shall submit one copy of the result of each of the tests at Site to the Employer's representative within one week of the tests being carried out. Four copies of the certified results of each of the tests at Site in the form of test reports or tests certificates shall be provided to the Employer's representative within one month of the tests being carried out. The staff of the Client shall be invited to observe and participate in the Tests on Completion.
11. The tests on manufacturing completion shall be carried out to the satisfaction of the Employer's representative before factory acceptance certificates are presented for signing.

The inspection and witnessing of tests shall not relieve the Contractor of his responsibility for meeting all of the requirements of the Specification and will not prevent any subsequent rejection if such material or equipment is later found to be incorrect or defective. The Contractor shall be responsible for all tests. Should any tests prove any equipment to not comply with this Specification, all costs to ensure compliance and of any subsequent tests, which the Employer may require, at his discretion, to prove such compliance, shall be borne by the Contractor.

It will be the contractor's responsibility to ensure that all protection current and time settings are coordinated with the relevant Eskom supply protection settings to ensure that proper grading of tripping curves are obtained to ensure downstream protection from the point of supply to avoid random tripping. The calculations and tripping curves will be submitted to the Employer's representative and shall be presented to ESKOM for approval before transformers and/or motors are energized. The costs of such current and time setting calculations shall be for the Contractor's account and must be included in the costing presented in the Bill of Quantities.

The following minimum site tests shall be carried out on the switchgear in the presence of the Employer's representative

3. DC voltage tests on the main and secondary circuits in accordance with BS 162, BS 5227 or IEC 298.
4. Insulation resistance tests.
5. Entering the calculated trip settings into all relays
6. Primary and secondary current injection tests to prove calculated settings and the operation of current transformers and protection relays and ammeters.
7. Earth continuity and earth resistance.
8. Mechanical and electrical functional tests.

7. The continuity and phase rotation of all circuits shall be tested.
8. Rotation and polarity tests shall be carried out on all current transformers.
9. Each current transformer shall be checked to ensure that it is earthed at one point only.
10. The manual and electrical close and trip mechanism of each circuit breaker shall be tested and the semaphore indicator(s) checked.
11. All electrical and mechanical indicators shall be checked to ensure that they function correctly.
12. All circuit breaker interlocks shall be checked to ensure that they are working properly.
13. All isolating switches, earthing switches and associated interlocks shall be checked in order to make sure that they are working correctly.
14. All connections to the earth system shall be checked for correctness.
15. All alarms, indicators, tripping units, fuses and switches shall be checked separately.
16. Tripping units shall be checked for proper operation at 50% voltage, as specified in BS 5311: Part I.
17. Each circuit breaker shall be checked with the tripping coil energised, to prove trip-free operation.
18. The insulation of all secondary wiring circuits shall be subjected to a voltage withstand test.
19. The insulation resistance of all secondary wiring shall be determined.
20. Ratio and insulation resistance tests shall be carried out on all voltage transformers if applicable
21. The earthing of their cases and windings shall be checked.
22. The resistance of the earthing system shall be measured and noted
23. All circuit labelling shall be checked.
24. The control, protection, instruments, metering equipment and circuits shall be tested to prove compliance with the tests described.
25. Three copies of the relevant test certificates shall be supplied by the Contractor.
26. Final relay settings will have to be carried out on site to suite the incoming 3.63 kV supply breaker settings.

Costing must include all insurance, transport to site, delivering, off-loading and placing switchgear in position, all lifting and/or handling equipment must be provided by the contractor. Insurance must include cover against lightning damage to the switchgear from the date of power on to the final handover date of the switchgear after the lapse of the retention period.

7. BATTERY TRIPPING UNIT (D.C. AUXILIARY SUPPLIES)

The 3.3 KV switchgear assemblies will require 24 V DC voltage battery tripping units with NiCad or NIMH type batteries of capacity not less than 22 A/h. The exact number of cells and capacity shall be determined from the voltage requirements of the circuit breaker closing and tripping circuitry and the discharge duties required by the switchboard.

The battery capacity shall be sufficient to perform either of the following functions:

(a) Five successive tripping and re-closing operations of all the circuit breakers on the switchboard
or
(b) A single tripping and re-closing operation of all the circuit breakers on the switchboard plus supplying all the standing loads on the battery for at least ten (10) hours.

A constant voltage type charger with current limiting facilities shall form part of the unit. The output voltage shall be kept with 1% of the float charge voltage designed for maximum charge conservation and a maximum battery life for variations of plus minus 10% of the input voltage. The charger capacity shall be adequate to supply any standing load on the battery plus a charging current which will recharge a fully discharged battery within eight (8) hours. The charger shall be suitable for operation on a nominal 230 Volt, 50 Hz mains supply or from a supply obtained from a voltage transformer.

The charger must be supplied complete with all the required controls including isolating circuit breaker, ammeter indicating rectifier output, battery voltmeter, mains on led indication, mains fail led, charge fail led indication and potential free alarm contacts for external monitoring. In addition, external monitoring contacts for battery fail, battery voltage low and high and earth must be provided. HRC fuse protection must be provided for each DC circuit supply.

The batteries and charger shall be housed in a 3 CR12 cubicle separate from the MV switchgear. The cubicle must be fitted with a removable, galvanized gland plate for bottom cable entry.

8. VARIABLE SPEED DRIVES

1. General

The variable speed drives to be supplied for this contract will be air-cooled units, rated to 3.3 KV and the specific motor sizes at the applicable pump stations. This part of the specification is for the design, design drawings, supply, manufacture, testing in the works of the manufacturer, packing, transport, shipping to site, off-loading on site, installation and assembly on site, connection of cables, testing on site, setting up software, commissioning and handing over of the Variable Speed Drives (VSD's) as specified.

2. Environmental Conditions

The equipment required shall be suitable to operate in the following environmental conditions:

- Site 1 100 m ASL
- Ambient Temperature 40 deg C
- Relative Humidity 50% Non-condensing

The equipment required will operate in a dusty and hot environment. The make-up air presented to the equipment for ventilation will be normal outdoor. Precautions are in place in the design of the buildings to minimize the presence of dust in the air and the VSD rooms will be air-conditioned. The ventilation equipment required for removal of radiated heat of the VSD shall form part of the VSD. The required equipment, fans and ducts for this purpose must form part of the structure of the VSD. The Contractor shall ensure that sufficient ventilation is provided for the equipment by drawing air from the room, through the equipment, and to the outside of the building if required.

3. General Requirements of the Equipment

Full technical details of the overall dimensions, total mass, mass and placement of the heaviest section of the equipment as well as ventilation requirements shall be stated in the Technical Data Schedules for VSD's offered in this Tender. The VSD drives will be supplied with power from separate 3.3 kV switchgear panels which will be situated in the same rooms as the VSD's. The drives must have network- and hard wire control facilities for starting and stopping.

The Contractor/Manufacturer/Supplier of the VSD equipment must carry out a modelling study of the power supply, drive equipment and motor combination to ensure that the drives equipment will not fail during transient conditions of whatever form during start-up, power down or running cycles of the drives.
Any damage to MV cables, motors or other equipment of the Employer, due to drive malfunction, will be for the account of the Contractor.

The drives shall be complete with harmonic filters and shall generate as low as possible 5th, 7th, 9th and 11th level harmonics on the line side or load side of the drives (voltage and current). The harmonic distortion generated (IEEE 519) by the drives shall be as low as possible and an upstream power factor of near unity are desired at all times.

An HMI terminal is required on the low voltage control cubicle door of the VSD.

The manufacturer of the equipment shall prepare and submit full working power- and control diagrams within the period as stated in the Design Criteria schedule herein. These drawings must be submitted for approval of the Employer's representative before any construction of the equipment is undertaken. The following elements must form part of the design and diagrams:

- Auxiliary Supply Requirements
- Communication Interface Communications Protocols (Ethernet/IP)
- External I/O requirements for hardwired external control and output indications
- Analog Inputs and Outputs.

The VSD equipment supplied under this contract must be commissioned on site by the manufacturers of the equipment and in accordance with this specification and the drawings and to the full satisfaction of the Employer's representative and the Employer. All control- and protection equipment settings of the VSD's and the programming of the software must be done by the manufacturers of the equipment, in the presence of the Employer's representative.

It cannot be assumed that the floor of the VSD room will be absolutely straight and level. This must be allowed for in the design of the equipment and the relevant pricing for installation of the equipment.
The incoming and outgoing MV cables for the VSD will be as specified in the cable specification section of this document and the Bill of Quantities. The copper earth wire installed with the MV cable from the 3.3 KV switchgear shall be bolted to the earth bar of the VSD assembly. The incoming and outgoing cable connections to the VSD's will enter from below the VSD drives.

All control wiring and power wiring ends, regardless on which equipment it terminates, shall either be lugged or ferruled. Ferrules or pin lugs shall be used on ends of small power wires where clamp terminals are used.

Labels on the front of panels and inside panels shall be fully descriptive, engraved on black on white engraved wafer material. All internal wiring must be numbered with all numbers indicated on the associated electrical diagrams. All labels shall all be done in English.

Control wiring internally to the equipment shall be housed in trunking mounted on the sides and above and below all DIN rail mounted equipment, forming a complete wire-way surround for control wiring.

4. Cooling and Ventilation

Tenderers must state clearly in their offers whether the equipment offered will operate in the environmental conditions of the MV/VSD room areas. The contractor must make allowance for the exhaustion of hot air to the exterior of the building via sheet metal ducting, or propose alternative arrangements, if the proposed air-conditioning system will not be sufficient to limit operating environmental temperatures within acceptable limits. Any such systems shall form part of the VSD portion of the contract and shall be manufactured, supplied and installed by the VSD contractor. All such ventilation ducts shall be either hot dip galvanized or powder coated sheet steel.

VSD front door grilles shall be fitted with removable and washable matted dust filter media, mounted in frames for easy removal and replacement.

5. HMI, Remote I/O Controls and Network

The HMI terminal of the VSD shall be located in the door of the low voltage or electronic control section of the VSD. The cubicle space behind the HMI shall not contain MV equipment or voltage higher than 230 V. Any 230 V terminals or live equipment shall be screened of for safety should the door be opened for access to the rear of the HMI or any of the connections thereto. The VSD's must be equipped with remote I/O and network facilities, switches and indicator lamps as stipulated below. Switches shall be key type with the key removable in any of the switch positions. It shall not be possible to turn the switch unless the key is inserted. Lamps shall preferably be of the multi-eye, 20 mm diameter LED type with replaceable bayonet type lamps. Control Buttons, Switches and Indicator lamps at HMI terminal

The following control push buttons, switches and indicator lamps are required on the operating panel section of the VSD and below the HMI terminal.

Door Mounted Push Buttons:
- Start
- Stop
- Jog (if available)
- Emergency stop (Lock-stop)

Door Mounted Selector Switches:

- Local/Remote key switch
- Off/Auto/Manual key switch
- Potentiometer for local operation.

Indicator Lights: (LED)

Run (Green LED)
System ready (Blue LED)
Ready (Blue LED)
Fault (Red flashing LED)
Warning (Amber LED)
Stopped (Red LED)

The HMI display may also be used for some of the above indications but main indications such as RUN and STOP shall be available in LED indicator lamps.

Digital and Analog I/O's

The following I/O's are required internally to the VSD.

Digital Inputs:

- Remote
- Local
- Forward
- Run
- Stop

Digital Outputs:

- In Torque Limit
- Cooling Alarm
- At Speed
- In Test Mode
- Warning
- Fault
- Running
- Stopped

Analog Inputs:

- Speed reference input (4 mA – 20 mA input signal).

Analog Outputs:

- Speed output (4 mA – 20 mA).

Communication

The following communication facilities shall be available in the VSD (at least one of the following)

Modbus TCP
Modbus RTU
Ethernet I/P

The signals that shall be available via the field bus system shall be programmed in accordance with the requirements of the Employer. All the available parameters of the VSD must be accessible by the PLC.
The communication between the VSD and the PLC shall be via Fiber-optic cable or copper core twisted and screened signal cabling, to the choice of the Employer's representative.

HMI Terminal

The terminal display and drive control system shall be available for use when the auxiliary 400 V/230V power is available in the VSD.
The terminal shall be user friendly and easy to use and the software of the control system shall be complete with a set-up wizard.
The set-up wizard shall automatically start when the drive at power up for the first time.

The instructions of the wizard shall assist with the setting up all the available system operating parameters and the drive as well as the external control facilities.
Warnings and comments shall appear on the display, together with help text to assist the user in setting up the operating system.
The display shall also have all the monitoring and troubleshooting facilities.
The VSD control shall have an "auto tuning" facilities which will operate together with the HMI and system software so that the drive can automatically tune itself to the load to enable fast start-up and smooth operation.
The display shall further show any warnings or abnormality when the drive is in operation.
Auto/Off/Manual and Local/Remote Operation

Operation of Key Switches

The operation of the switches shall offer the following functions:

Auto/Off/Manual settings

(i) With the Auto/Off/Manual switch set to OFF the VSD shall not operate at all.
(ii) With the Auto/Off/Manual switch set to AUTO and with the Local/Remote switch set to REMOTE, the VSD shall operate fully automatically and shall START and STOP upon hard wire or network commands from a remote position (PLC control). The potentiometer on the VSD shall be inactive and the speed shall be set by the PLC software and via the network or via an analogue signal from the PLC.
(iii) With the Auto/Off/Manual switch set to MANUAL the VSD shall only operate only with the START and STOP buttons on the VSD control panel or by using the user buttons on the HMI and only when the Local/Remote switch is set to LOCAL. In this case the potentiometer on the drive control panel shall be operational and shall control the motor speed.
(iv) Whenever the Auto/Off/Manual switch is turned from AUTO through OFF to MANUAL the drive shall STOP and shall not start again until the Local/Remote switch is switched into the LOCAL or REMOTE position and then only as specified in EL-18.9.2 herein.

Local/Remote settings

(i) With the Local/Remote switch set to LOCAL the VSD shall only operate by means of the START and STOP buttons on the VSD control panel or by using the user buttons on the HMI.
(ii) With the Local/Remote switch set to REMOTE the VSD shall only be able to operate remotely by the remote hard wire signals or the PLC software via the network port.

The Off/Auto/Manual and Local/Remote switches will therefore form an interlock to prevent simultaneous operation from two sources i.e. the PLC controls and the drive controls.

Start-Up Alarm

An adjustable (15 seconds to 30 seconds) start-up delay period shall be active whenever any of the Auto/Off/Manual or Local/Remote switches on a VSD are switched or before any drive shall start, either locally or remotely controlled. During this period a start-up audio alarm shall sound in the pump station.

9. GENERAL CONTROL SPECIFICATION

This portion of the specification covers the minimum technical requirements for the design, manufacture, documenting and testing of a PLC control system for the monitoring and local- and remote operation of the various pump stations. The following items need to be considered:

1. Each pump station will have an HMI on the Control Panel containing the PLC equipment.
2. In addition, each pump station will also have a remote HMI installed in a suitable location closer to the pumps.
3. Each HMI will offer complete control of the local pump station via interaction with the PLC. All reservoir and sump levels will also be available on these HMI's.

A control philosophy will be available and must be used for the final design of the PLC control system. The control philosophy will have all pertinent information regarding of what equipment and control is needed. An approved system integrator must be employed to ensure that the PLC control system is installed and configured correctly and that the required graphic displays on HMI screens and SCADA monitors are done in a professional manner and to the satisfaction of the Employer's representative. The software programming and the screen graphics of the system therefore form part of this Contract.

There will be one PLC per pump station, with a Remote I/O Junction Box for each pump set, controlling the stopping/starting and duty of the pumps in the specific pump station. This PLC will also monitor reservoir levels, temperatures, flows and general alarm conditions. It will also interact with the PLC's in the other pump stations. The fibre optic cable will be used to transmit and receive the signals between the various elements of the system to establish a cohesive, integrated control system.

The type of PLC's will be as per the included electrical diagrams. The HMI's required in this Contract shall be of the colour TFT HMI touch type screen with minimum size of 10" and sufficient memory to accommodate all controls and related graphic pages, alarm logs and trend graphics.

The PLC cabinets, pump junction boxes and the control consoles shall include all the required marshalling terminals, internal wiring, fuses, relays, fibre optic termination equipment, PLC backplanes, PLC modules, network cards, etc., all as applicable for the particular PLC and as indicated on the electrical diagrams.

10. SYSTEM SOFTWARE

The principal of operation in the project software shall be automatic operation of the pump stations to ensure maximum level retention on all reservoirs.

Auto/Off/Manual controls switches shall be available in all starters and all actuators will have Local/Remote switch facilities for maintenance use and for possible manual control should the automatic system malfunctions.

All actuators in the works will be remotely controllable from the PLC systems, allowing the automated operation of the pump stations as required. All I/O required for this is indicated on the relevant electrical diagrams. It will be an advantage if the Actuators are fitted with network interface cards (Modbus TCP or Ethernet IP) but is not a specific requirement, as the control design has been based on hard-wired control.

The Employer or the Employer's representative will decide, after award of tenders, which of the data must be displayed on the HMI and SCADA screens and/or used in the control system for proper system control. The Contractor shall check and discuss the I/O list together with the Employer's representative to make sure that all signals available on site in the pump station are included in the final I/O list before commencing with ordering of equipment and the programming of the PLC systems.

The Contractor shall supply and use the required software packages as part of this tender. The software and all setup files and the final installed and working program(s) (in software and hardware) shall become the property of the Employer upon completion of the project. It will remain the responsibility of the Contractor to provide the software packages required to complete this project.

11. CABLE INSTALLATION

1. Installation of Cables

(a) Cables with copper conductors shall be used throughout unless otherwise specified or approved.
(b) All un-armoured cables shall be installed in metal trunking, sleeves or conduit unless clearly specified to the contrary.

2. Competence of Personnel

It is a definite requirement that the Contractor shall only employ personnel fully conversant with cable manufacturer's recommendations for joining and terminating of cables.

3. Identification of Cables

Cables shall be identified at all terminations by means of strap-on type cable labels with PVC digit inserts. The use of PVC tape with punched characters is not acceptable. The identification numbers of cables shall be shown on "as built" drawings of the Installation.

4. Installation of Underground Cables

Cables shall be installed at the following minimum depths below final ground level:

Up to 1 KV:	600 mm
Above 1 KV:	1000 mm

All cable depth measurements shall be made to the top of the cable when laid directly in ground or to the top of the duct or sleeve where these are provided. The above depths shall apply to the top layer where cables are installed in layers. The Contractor may only deviate from the above depths provided prior authority in writing has been obtained from the Employer's representative. In this event the cables

shall be protected with a suitable concrete covering. The depth of cable pipes or ducts beneath railway lines or roads shall be not less than 1,1 m below the formation level.

5. Cable Spacing

Cables installed in the same trench shall be laid parallel to each other with the following spacing between the cables:

LV/LV:	2 cable diameters.
LV/ Existing H:	300 mm minimum.

Where HV and LV cables have to be installed in the same trench, the HV cable shall be laid on the one side of the trench at a depth of 800 mm and then covered with 300 mm of soil. The LV cable shall then be laid on the other side of the trench, i.e. not above the HV cable, and then completely backfilled. (HV cables referred to in this paragraph are existing HV cables).

Cables for telephones, communication systems and other low voltage systems (less than 50 Volt) shall be separated from power cables by at least 1 m. All control or pilot cables shall be laid at least 300 mm from power cables. Cables shall not be buried on top of each other unless layers are specified. The minimum spacing between layers shall be 200 mm.

All cable must be installed on the specified cable ladders and trenches in the pump stations and other areas indicated. Control cables shall be installed as far away as possible from 3.3 KV and 400 V cables on cable ladders or in trenches and shall be mounted in hot dip galvanised trunking or steel conduits. These services can be mounted on the side of cable ladders.

Spacing between control cables and 400 V power cables on cable ladders shall not be less than 100 mm.

6. Cable Laying

Except where ducts, tunnels or pipes are provided, cables shall be laid directly in the ground. The cable shall be removed from the drum in such a manner that the cable is not subjected to twisting or tension exceeding that stipulated by the cable manufacturer. Cable rollers shall be used as far as possible to run out cables. Rollers shall be spaced so that the length of cable in the trench will be totally suspended during the laying operation and sufficiently close to prevent undue sagging and the cable from touching the ground. Rollers shall also be placed in the trench in such a manner that they will not readily capsize. Cable rollers shall have no sharp projecting parts liable to damage the cables. Where cables have to be drawn around corners, well-lubricated skid plates shall be used. The skid plates shall be securely fixed between rollers and shall constantly be examined during cable laying operations.
Where cables have to be drawn through pipes or ducts, a suitable cable sock shall be used and particular care shall be exercised to avoid abrasion, elongation or distortion of any kind. The maximum allowable tension when pulling a cable is 70 N/mm sq of conductor area. It will be assumed that the price or rates contained in the tender includes for the installation of cables in pipes and ducts or below existing or newly installed services as specified in the Bill of Quantities.

The Employer’s representative shall be informed timeously of the intention to carry out all cable laying operations to allow an inspection of the works if so required.

7. Installation of Cable on Trays, in Building Trenches and Service Ducts

Cables shall be installed in one of the following ways:

(a) On horizontal cable trays.
(b) On horizontal metal supports with suitable clamps.
(c) On vertical cable trays or metal supports fixed to the side of the trench. The cables shall be clamped in position.

Cables shall not be bunched and laid on the floor of the building trenches.

Suitable clamps (cleats) which will secure cables without damage shall be used. Metal clamps or expanding type fixings shall be used. Clamps shall consist of adjustable metal wings which clamp to a metal support or consist of two halves that are bolted together. The correct clamp size to fit the cable shall be used. Cables of different sizes may only be fixed by a common clamp when the clamp is specially made to accommodate the various cables.

8. Spacing of Supports

The maximum spacing between cleats (clamps) to which cables are fixed in horizontal and vertical cable routes shall be determined as indicated below. Take note that additional cleats shall be installed at each bend or offset in the cable run.

The maximum distance between supports or cleats for multi-core control cables shall be 20 times the outside diameter of the cable with a maximum spacing of 550 mm for un-armoured cables and 30 times the outside diameter of the cable with a maximum spacing of 900 mm for armoured cables. Spacing of supports for cables for high voltage lighting shall be in accordance with the relevant SANS specifications.

A minimum of 20 mm ventilation clearance shall be maintained between cables and the wall to which they are cleated.

9. Cables for Other Services

Cables for telephones, communication systems and other low voltage systems (less than 50 Volt) shall be separated from power cables. In building ducts, a physical barrier shall be provided between power cables and cables for other services. Where armoured cables are used for such other services, they shall be installed on separate cable trays or shall otherwise be at least l m away from power cables. Where un-armoured cables are used for these other services, they shall be installed in separate conduits or metal channels.
For larger cables the spacing shall be 10 x outside diameter of the cable.

10. Termination and Jointing of Cables

Cable ends shall be terminated with glands or in cable boxes with the associated accessories such as clamps, shrouds, etc. complying in all respects to the Standard Specification for LV Installations. An O-Line channel or other approved means of support shall be provided to remove mechanical stress from the glands. Cable cores shall be marked with heat-shrunk sleeves where necessary to identify the phases.

Termination of PVC-insulated Cables

Cable ends shall be terminated by means of adjustable glands. The glands shall be fitted in accordance with the cable and gland manufacturer's instructions. The correct size and type of gland shall be used for the particular cable and application. Suitable lugs shall be used, crimped, using mechanical or pneumatic tools designed for this purpose, to the cable conductor ends. Contact surfaces shall be thoroughly cleaned and smoothed and fixing bolts shall match the hole size of the lug. Cables that are connected to clamp type terminals where the clamping screws are not in direct contact with the conductor need not be lugged but the correct terminal size shall be used. Ferrules shall be used as far

as possible where cable conductors are connected directly to equipment with screws against the conductor strands. When cutting away insulation from cable conductors to fit into lugs, care shall be taken that no strands are left exposed. Under no circumstances may any of the conductor strands be cut away to fit into lugs.

Joints

Joints in cable runs will not be allowed unless specified in the Project Specification or authorized by the Employer’s representative. Jointing shall be carried out strictly in accordance with the manufacturer's instructions and by personnel competent in jointing the types of cables used. LV cable joints shall be of the epoxy-resin type.
Joints shall be fully water- and air tight and shall be free of voids and air pockets. The crossing of cores in joints will not be permitted under any circumstances.

Testing

Each cable shall be tested after installation in accordance with the relevant SANS (up to 1 kV) as well as the requirements of the Local and Supply Authorities. LV cables shall be tested by means of a suitable megger at 1 kV and the insulation resistance shall be tabulated and certified. The Contractor shall make all arrangements, pay all fees and provide all equipment for these tests. The cost of testing shall have been included in the tender price. The Contractor shall notify the Employer’s representative timeously so that a representative of the Employer’s representative may witness the tests. On completion of the tests on any cable, the Contractor shall without delay, submit three copies of the certified Test Reports to the Employer’s representative.

All measurements for payments shall be made jointly by the representatives of the Employer and the Contractor shall obtain the signature of the Employer's representative including approval of such measurements. All cable lengths indicated in the Project Specification and/or shown in the cable route drawings shall be regarded as estimates and are given for tendering purposes only. The successful tenderer shall measure actual cable lengths on site before ordering.
The final price for the supply and installation of all cables will be adjusted, on the basis of the actual lengths of installed cables, in accordance with the unit rates quoted at the time of tendering. Cable lengths shall be measured on site to the nearest 500 mm for this purpose and surplus cable will not be remunerated for. The Contractor shall carry out a final "as built" survey of the cable routes and present" as built" route plans of the complete installation. The following information shall be reflected on the plans or submitted as separate schedules with the plans:

(a) Overall length of each cable.
(b) Locations of all joints (if any) in relation to permanent reference points. Dimensions shall be shown and the method of triangulation i.e. two dimensions to each joint, shall be used.
(c) Identification of each cable.

The works will be deemed to be incomplete until all tests have been conducted successfully and all "as built" drawings and schedules have been handed to the Employer's representative.

12. EARTHING

Earth mats and earth conductors are required for the new MV switchgear on all the sites of the works. As there are existing earth mats on the sites, an earth resistivity measurement shall be undertaken on the sites, before any earthing installations are planned and materials installed. These measurements shall be undertaken by a specialist firm and their recommendations will be implemented as required, after approval by the Employer's representative. The cost of this survey must be included in the project costing.

The Contractor shall submit a detailed report from the survey specialist to the Employer's representative together with recommendations on the earthing systems required, thus meaning a detail design of routes and connections. The report shall clearly indicate whether the systems as specified (or installed) are sufficient and, if not, the proposed additional earthing requirements plus the cost thereof.
The required survey shall be done in compliance with the SANS code for lightning protection and the maximum earth system value required is 1 ohm, referred to zero as measured with a null balance megger. The maximum earth system value required is ≤1 ohm for electrical earths and ≤5 ohm for lightning protection earths.

Earthing materials have been measured in the Schedule of Quantities as preliminary quantities for earth systems and the final quantities will be determined by the test results and the extent of the works.
All earthing shall be carried out as specified herein and shall also comply with the requirements for earthing as stated in SANS 10142-1: Part 1: Low Voltage Installations (as amended).

Final testing of the earth system shall only be undertaken once the earthing system is fully completed. No part of the new electrical installation shall be made alive until all earthing is solidly connected.
All main earth conductors shall be 70 mm sq bare stranded copper earth wires and all joints in the ground shall be CADWELDED and taped with M23 self-bonding tape.

Earthing electrodes used for the main earth system shall be solid steel with bonded copper protection.
The nominal diameter of earthing electrodes shall not be less than 16 mm unless the electrodes are specified for placing in pre-drilled holes in which event a minimum nominal diameter shall not be less than 12 mm.

Main earth conductor ends in MV switchgear or LV distribution panels shall be lugged and bolted to the earth bars of such equipment.
Main earth mats/rings shall be installed next to new outdoor MV switchgear or MV switchgear rooms on all the sites, if required by the report of the specialist indicated above. The main earth mats/rings shall each consist of five separate 1,8 m earth electrodes. Four electrodes shall be installed at the corners of a rectangle measuring 4 m x 4 m with the top of the electrodes at least 300 mm below the slab with one 1,8 m earth electrode placed at the center of the rectangle. Bare stranded 70 mm sq copper earth wires shall be Cad welded to the 4 corner electrodes and shall end and be extended to, and Cad welded, to the center electrode.

Earthing electrodes used for the earth mat shall be solid steel with bonded copper protection. The nominal diameter of earthing electrodes shall not be less than 16 mm diameter. Bare stranded 70 mm sq copper earth wire shall further be installed from the earth mat to the earth bar of the particular MV switchgear on the site as well as to the transformer tank earth studs and to the neutral terminal on the 400 V side of transformers. Bare stranded 70 mm sq copper earth wire shall also further be installed from the earth mat to the earth bar of the LV switchgear and to the earth bars of the VSD's. All metal structures carrying or housing electrical equipment shall be bonded together with 70 mm sq copper earth wires.
Main 70 mm sq copper earth wires shall be installed together with all MV cables and main LV supply cables.
All MV cable armouring shall be properly bonded to the earth bars or cable box earth studs at the MV
switchgear or transformers.

Earthing of the pump motors shall be done by means of BCEW as indicated on the Bill of Quantities.

Final tested earth readings shall be filled on the COC for each site or separate section of each site.

The contractor shall issue the Certification of Compliance, and the Contract will not be regarded as completed and will not be accepted by the Employer's representative unless all the requirements for testing, drawings, manuals and the certification has not been completed and all data has been handed to the Employer's representative.

All the junction boxes, cabinets, earth bars- or points in equipment cabinets and cable ladders installed under this Contract shall be earthed to the nearest earth point. It is a requirement of this Contract that the earthing and bonding of the installation comply with SANS 10142 -1 (latest edition). A sum amount must be tendered for earthing and bonding of the equipment specified in this Electrical Contract.

13. LV SWITCHGEAR

This portion of the specification provides for the design, manufacture, supply, works testing, delivery, off-loading, site erection, connections, site testing, commissioning and handing over of free standing indoor 400 V/230 V distribution assemblies. The assemblies shall be suitable for 400 V/230 V systems and shall consists of an incoming circuit breaker and outgoing circuit breakers as indicated on the single line and other electrical diagrams. All ratings and preferred equipment are shown on these diagrams. Fault ratings must be as indicated on the diagrams.

Distribution boards and all other assemblies containing 400 V/230 V shall be constructed and carried out in compliance with SANS 1765, Clauses 6.6.1 and 6.6.2 of SABS 10142-1 for assemblies which operate fault ratings of <10 kA and SANS 1473-1, Clauses 6.6.1 and 6.6.2 of SABS 10142-1 as well as SANS 61439-1 for assemblies which operate fault ratings of >10 kA.

All 400 V assemblies and boards in this Contract shall be manufactured from 1.6 mm 3CR12 steel and shall be powder-coat finished in "Light Orange" powder coating in colour B26 of SANS. The assemblies shall all have hinged face panels. All face panels shall have heavy duty pedestal stainless steel hinges and folded edges and shall fit over lips on their compartments and shall be sealed all round with neoprene seals. Hinged face panels are required with 6 mm square cam type locks, top and bottom on the lock side of the panels. All assemblies must also have hinged outer doors. All doors shall have heavy duty pedestal stainless steel hinges and folded edges and shall fit over lips on assembly and shall also be sealed all round with neoprene seals. The rating of the circuit breakers and other equipment required in the assembly shall be as shown on the single line diagrams accompanying this document.

Circuit breakers and instrumentation shall be mounted on removable chassis flush behind the face plates in the assembly. All door handles shall make provision for padlocks. Danger warning signs shall be fitted to outer doors as required by the OHS Act

Busbar compartments or busbar arrangements for indoor assemblies shall always be mounted at the top of assemblies. Busbars of outdoor assemblies shall be mounted in the top section of the assembly, below the pitched roof, on high impact plastic insulators. Neutral busbars in three-phase, four wire assemblies containing three phase balanced loads shall have a cross-section of at least 50% of the cross-section of the phase busbars.

Removable 2 mm thick galvanized gland plates, covering the whole bottom of assemblies, shall be provided. The gland plates shall consist of separate removable sections, lying front to back in the assembly. Gland plates shall be at least 300 mm above floor level in assemblies for ease of cable glanding. Assemblies shall further be fitted with removable covers to give access to cable glands below gland plate level.

14. LIGHTING INSTALLATION

All the materials for the lighting installation have been allowed for in the Schedules of Quantities. All light fittings will be supplied complete with lamps. The positions of light fittings will be indicated on layout drawings to the successful tenderer.

All light circuits shall consist of 2,5 mm sq 3- and 4 core armoured cable mounted on cable ladders or the surface of the structure.

Circuit supply wires, neutral wires, earth wiring and switch return wires shall all form part of such a single cable run and only one phase must be present in any cable run.

Cables to lights shall follow cable ladder routes as far as possible. Straight runs of cables on surface from a cable ladder shall be mounted in 20 mm hot dip galvanised conduit and conduit shall be saddled at 1 m intervals on hot dip galvanised spacer saddles (hospital saddles).

T-off on cable runs to switches and to light fittings shall be by means of PRATLEY boxes and compression cable glands.

All the cabling and light fittings must be tested on completion of the system by the Electrical Contractor for this Contract together with the Employer's representative.

15. CABLE LADDER AND LADDER INSTALLATIONS

All the cable ladder materials shall be factory manufactured by a reputable supplier (for example O-Line) and shall be of the hot-dip galvanized mild steel type. Detailed layout drawings of the installations have not been provided, but sufficient materials have been measured in the Schedule of Quantities to allow for complete installations. The cable ladder installation shall also be done complete with radius bends or offset sections, where the ladders change direction.

The Contractor shall measure the actual lengths and number of T-sections, bends, supports, etcetera required on site before ordering materials to avoid over-supply of material on site.

All horizontal bends, internal- and external bends, T-offs and 4-way sections shall be from the same supplier as the racking and must be of the same size, construction and rung heights as the racking onto which they are fitted. All joints in ladders shall have heavy duty angle side splice plates with 8 x M8 bolts to each splice on each side of the ladder.

Cable ladders shall be mounted on sections of hot dip galvanised strut, mounted on the structure of the Works with expanding type bolts. Supports shall be installed at 1000 mm distances along all the ladder routes.

Cutting and welding of cable ladders will not be allowed on site. The total ladder installation shall be bolted together on site using hot dip galvanised bolts and nuts. The standard clamps, spring loaded strut clamps, etc. of the ladder and ducting suppliers shall be used throughout.

Fixing of ducting, where specified, to building structure shall be by means of staggered fixing points, 1.5 m apart, through the back of the ducting. Expanding bolts for this purpose shall be 5 mm diameter minimum.
Ducting mounted in cable trenches shall be fixed to the side of the trench and as far away as possible from MV or 400 V cables in the same trench. Final mounting positions will be determined on site for all trunking and cable ladders.

16. MOTOR EMERGENCY STOP/ FIELD JUNCTION BOXES

Each motor will have this unit mounted on a free-standing pedestal next to the applicable motor. The enclosure and its' contents are detailed in the electrical diagrams included with this tender. The enclosure shall be equipped with an E-Stop pushbutton, hard-wired into the stop-circuit of the applicable pump starter. The units will also act as a remote Start facility for the applicable motor, as well as a field instrumentation junction box with Remote I/O for monitoring motor/pump temperatures and vibrations, no-flow conditions, delivery pressure and inlet flow, as well as monitoring and control of actuated valves. The Remote I/O will communicate with the pump station PLC via an Ethernet IP communication interface.

17. MANUALS, DATA RECORDS AND DRAWINGS

All data pamphlets packed with equipment and other pamphlets, handbooks of equipment, operating instructions of equipment, drawings, etc., shall be kept in safe storage by the Contractor during the Contract period. The Contractor shall also keep accurate records of all tests carried out on equipment and cables and of the test results so achieved. Records shall be kept of setting values of instrumentation and all meter readings taken during testing and commissioning, as well as records of all final adjustment readings or changed settings done during the maintenance period.

A comprehensive operational- and maintenance hard copy manual shall be built-up by the Contractor, using the above, as well as other data and descriptions as specified below. All drawings and diagrams shall be done in AUTOCAD 2010 (or later) format and all text shall be submitted in the latest edition of Microsoft Word format. All tabular data shall be submitted in the latest edition of Microsoft Excel format. All pamphlet and brochure data shall be submitted in Acrobat 5 (or later) format.

The number of copies as scheduled in the Bill of Quantities, of the manuals described herein, shall be made up by the Contractor. The manuals shall be presented to the Employer's representative on the first day of "wet commissioning", if handover of the Works is done on that day. The manuals shall be neatly housed in lever arch files and shall be in typewritten and/or printed format, properly indexed, with appropriate 2- or 3-layer card dividers between each section to facilitate ready reference.

A main index shall be placed in the beginning of each manual. The project name and project description shall appear at the top on the main index of the manual. Coloured dividers shall preferably be used.
The manuals and drawings shall cover all installation, operation, and maintenance schedule aspects of each item of equipment and all circuitry provided under this Contract.

The manuals, if approved, will be handed to the Employer or the representative of the Employer, so that the Works can be operated correctly and safely. Any changes which may be necessary to the contents of the manual after the commissioning of the Works shall be done by the Contractor and sufficient copies of the altered data shall again be submitted to the Employer's representative for binding into the manuals. This process shall be repeated for the duration of the maintenance period or until the final certificate is issued by the Employer's representative for the project.

A "Practical Completion Certificate" and subsequent "Certificate of Commissioning" will only be issued on receipt of accurate and final "as-built" drawings and documentation to the approval of the Employer's representative. Such documentation shall be presented to the Employer's representative on the first day of commissioning of the works. Any certification of "Practical Completion" or "Commissioning" of the works is subject to final approval of such documents and drawings by the Employer's representative. Wherever manufacturer's manuals refer to types of equipment other than the exact type as installed, the exact type shall be highlighted throughout such manuals. This will serve to ensure that:

- The Employer knows where all the equipment and materials are installed
- Fault finding in the electrical system can be done in future
- Alterations and additions can be undertaken in future by referring to the drawings to determine the built-in capacity of the electrical system without having to determine this data on site. It is therefore imperative for the Contractor to produce and supply as-built diagrams, together with detailed installation schedules, to be included in the above.

The Contractor shall keep all drawings and diagrams prepared during the course of production and installation of the Works and shall present this to the Employer's representative on completion of the Contract. Such drawing shall at least consist of all the drawings the Contractor used for construction and installation work as well as all data of final positions and final settings of equipment. All cable positions on the site of the Works shall be shown on layout drawings, together with dimensions taken on site from fixed points to show exact location of underground cables. Drawings shall preferably be done in A3 format and on the standard border and title block sheets of the Employer, unless permission is granted in writing by the Employer's representative for other formats of title blocks. All drawings shall be properly numbered with the numbering system required by the and the number of the particular sheet and the total number of sheets shall be shown on each drawing.

Electronic copies, on disc or CD, of all "as built" drawings prepared by the Contractor during the course of the Contract, as well as all electronic copies of software and descriptions of equipment, handbooks or sales data shall also be handed to the Employer's representative, together with the hard copy "as built" drawings and manuals, in quantities and formats as specified in the Project Specifications

A set of three (3) prints of the shop drawings for all the distribution boards, motor control panels and electronic control panels shall be submitted for approval before any of the aforementioned boards or panels are manufactured.

The manuals shall contain detailed operational description (of all switchgear and control equipment in substations, motor control panels, distribution boards, etc. i.e. all proprietary assemblies), and shall be provided to assist the user personnel of the Employer with advanced knowledge of the equipment for short-, medium- and long-term maintenance- and operations of the plant and the works.
The descriptions must be complete in all respects and the Contractor shall also ensure that these manuals are prepared in such a manner that, in the opinion of the Employer's representative, a competent and qualified technician can trace any fault, identify any defective component, replace it with the correct spare part and follow, without difficulty, the exact function of every component. To this end, care must be exercised to correlate the text with the circuit diagrams, to relate the diagrams one with another and to provide a simple method of diagnosis and test to be used wherever breakdowns occur. The manuals shall also include block diagrams giving the layout of equipment as well as a description of the function and operation of every unit in the system. The manuals shall be neatly prepared, in typewritten and/or printed format, indexed, with appropriate dividers between each section to facilitate ready reference. All documentation shall be presented in the English language.

The description shall, as a minimum requirement, include Operational and maintenance data and details of all assemblies or components of electrical equipment installed in the plant. Copies of operational manuals of manufacturers can be inserted in these descriptions. In the case of insufficient descriptions in manuals of manufacturers, the Contractor shall provide additional descriptions to enable maintenance of the equipment.

The descriptions shall include:

(i) Technical details of all equipment installed
(ii) A complete description of the operation of all equipment.
(iii) A parts and spares list of every item of equipment together with a description of the item, the name, address and telephone number of the original supplier or wholesaler of the equipment. Brochures may be added as additional information but must not replace the data required.
(iv) Complete equipment schematics
(v) All manufacturers' handbooks having reference to the equipment
(vi) Installation test and alignment procedures
(vii) All circuit diagrams
(viii) All interconnection and inter-cabling diagrams
(ix) Complete trouble shooting procedures and any other information deemed necessary to permit rapid and efficient maintenance of any part of the equipment by a qualified technician.

The operating procedures contained in the manuals shall contain the following detailed features in fully descriptive format:

Operating Procedures

a) Pre-start-up checks of all electrical equipment
b) Routine running attention
c) Stopping the plant
d) Prolonged shut-down of the plant
e) Re-commissioning of the plant after repairs, maintenance or prolonged shut-down

Maintenance

Routine maintenance procedures
a) Description
b) Schedule

Fault Finding Procedures

a) Supply faults
b) Main control faults
c) Investigation procedure for detection of motor starter faults and remedies:
   i) Symptom
   ii) Probable fault
   iii) Remedy
d) Investigation procedure for detection of auxiliary equipment faults and remedies:
   i) Symptom
   ii) Probable fault

iii) Remedy

Safety Precautions

a) The nature of each hazard
b) The level of seriousness
c) How to avoid the hazard
d) The possible consequences of not avoiding the hazard

In the case of sealed assemblies or advanced assemblies of equipment that cannot be opened or maintained or repaired on site, the Contractor shall provide sufficient data and instructions for the replacement of the assembly and shall further describe the measures which the user or operator of the plant can follow to operate the plant in an emergency and, if necessary, operate the plant manually, to overcome total shut-down or non-operation of the plant or Works until a new replacement can be installed. The descriptions for temporary operational measures shall be of sufficient nature to enable interim safe operating conditions of the plant and shall further not be of a nature which shall cause damage to other parts or sections of the plant.

18. TESTING AND TEST EQUIPMENT

1. General

All materials and workmanship shall be of the respective kinds described in the Contract and in accordance with the Employer's representative's instructions and shall be subjected from time to time to such tests and by such persons as the Employer's representative may direct at the place of manufacture or fabrication or on the site or at all or any of such places. The LV equipment, MCC's and other distribution boards, etc., shall be tested in the factory by the manufacturer and the Contractor in the presence of the Employer's representative before the equipment is shipped to site. The Employer's representative must be given minimum one week notice ahead of testing, to enable him to attend the tests. Except as otherwise provided in the Specification, the Contractor shall supply such assistance, accommodation, instruments, machines, labour and materials as are normally required for examining, measuring and testing of any work and the quality thereof. For witness testing of Variable Speed Drives, Switchgear or other items which is not done in South Africa, it will be the responsibility of the Contractor to make provision for the Travel, accommodation and Dining costs for the Employer's representative.

The cost of making any test shall be borne by the Contractor if such test is clearly intended by or provided for in the Specification and (in the case of a test under load or a test to ascertain whether the design of any finished or partly finished work is appropriate for the purposes which it was intended to fulfil) if such is particularized in the Specification in sufficient detail to enable the Contractor to price or allow for the same in his Contract Price.

If any test is ordered by the Employer's representative which is either -
(a) not so intended by or provided for; or
(b) not so particularized; or
(c) though so intended by or provided for is ordered by the Employer's representative to be carried out by an independent person or body at any other place than the site or the place of manufacture or fabrication of the materials or equipment tested; then the cost of such test shall be borne by the Contractor if the test shows the workmanship or materials not to be in accordance with the provisions of the Contract or the Employer's representative's instructions, but otherwise by the Employer.

The Contractor shall keep records of all the data of tests and shall submit this data to the Employer's representative upon completion of all tests. Such data shall include the results of:

(a) Earth tests
(b) Insulation tests
(c) Continuity tests
(d) Pressure tests
(e) Impedance tests
(f) Performance or rating tests
(g) Impulse tests
(h) Temperature tests, etc.

Tests carried out in the factory of the manufacturer or at a testing facility shall be done in accordance with the prescribed standards for such tests. The applicable standards for such tests shall be SANS, BSI, IEC, DIN, NEMA or such acceptable standard as may be applicable to the product or equipment or assembly.

The Contractor shall further carry out any other special test as may be required by the Employer's representative in a manner or in accordance with the standards as may be required by the Employer's representative. The Employer's representative will have the right to obtain a quotation from the Contractor for any special tests which are required by him and to instruct the Contractor to carry out such tests.
If equipment should fail a standard or prescribed standard test by a testing authority, the cost thereof shall be for the account of the Contractor.

2. Factory Tests and Inspections

The Contractor shall inform the Employer's representative as soon as any equipment or any part of an installation in the place of manufacture or on site is ready for inspections or tests. The Employer's representative shall be given sufficient notice in advance of inspections or tests and final dates and times of such inspection will then be confirmed with the Contractor by the Employer's representative.

The inspection or testing of manufactured equipment in a factory by the Contractor or by any other test facility in the presence of the Employer's representative must not be regarded as acceptance of responsibility by the Employer's representative for the correct performance of such equipment on site.
The factory tests shall be done as far as possible with full control conditions as may be experienced on site. All remote controls of equipment must be simulated during these tests by using temporary connected toggle switches to replace remote field devices such as probes, lock-stops, etc. No wire straps which have to be inserted or taken out whilst testing is under way, will be acceptable.

Temporary simulated signals for the future field instrumentation or signals for future telemetry controls and field instrumentation must be available during the factory tests and must be fully operative and all field signals must be simulated during these tests by using toggle switches or signal generators.

3. Site Tests and Inspections

The inspections by the Employer's representative of any part of an installation or Works on site do not exempt the Contractor from his responsibilities in terms of the Contract. The Employer's representative will only accept the completed installation work after having received all test results, commissioning results and certificates of compliance or test certificates of the Supply Authority (if applicable) on completion of the whole of the Works. The Contractor shall provide a clean and safe testing area on site of any equipment to be tested and inspected by the Employer's representative. All live equipment shall either be screened off or enclosed so that inspecting persons are not endangered during such tests or inspections.

Test equipment, test leads, clean writing top space and all other facilities shall be provided for Employer's representative during such tests. The Employer's representative reserves the right to instruct the Contractor to carry out the re-testing of any equipment which does not pass the first inspection or test.
The time and travelling cost of the Employer's representative for the purpose of any re-testing of equipment which did not pass the first or a previous test may be for the account of the Contractor. Any delays in Contract time caused by failures of inspections or tests will also be for the account of the Contractor.

The Contractor shall carry out all tests and shall do all settings of electrical equipment to safeguard the equipment of other Contractors, before site testing is carried out by the Employer's representative. Any abnormal condition, beyond the control of the Contractor, which may come to the attention of the Contractor during any preliminary or final tests or commissioning procedures shall immediately be reported to the Employer's representative.

19. COMMISSIONING

The commissioning on site shall include all of the following procedures and is defined as follows:

1. Dry Commissioning

The "Dry Commissioning" of the plant shall comprise the checking and confirmation of the installation of all equipment as described in the works, including switchgear, distribution and control boards, instrumentation and any other related equipment. In addition, all cable connection and terminations will be checked and confirmed during this action. All equipment labels will be checked and confirmed. All earthing installation work must be completed. In addition, the following must be implemented:

All safety checks and tests must be completed.
All basic settings of motor protection equipment and overloads must be set and checked where possible.

On completion of the above, switchgear must be brought to a ready state, with lock-stop circuits, liquid level protection, external controls such as stop-start stations, telemetry connections, etc., i.e. all controls which can prevent start-up of the equipment, completed and in correct working order.

The relevant system may be powered on to allow the checking of motor direction, to be checked in conjunction with the supplier and/or contractor responsible for the mechanical installation, preferable with the Employer's representative present as well. The responsibility of correct rotational or operational tests rests with the Electrical and Mechanical contractors. Couplings of motors shall be uncoupled from pumps for the purpose of direction of rotational checking.

Submersible pumps shall be submersed in water during such tests.

The Contractor can then proceed to complete the installation to bring it to a ready state for "wet commissioning" of the Works.

2. Wet Commissioning

"Wet Commissioning" shall include the following actions and shall be done with the Employer's representative present and shall require the presence of the Contractor for as long as it is necessary to carry out all the actions hereunder or as may be further required by the Employer's representative.

(a) The motors and pumps and other ancillary equipment shall be run under load with the equipment and loads connected, aligned and ready for operation, and with sufficient water in the suction lines in the case of pumping installations.
(b) Protection equipment, such as protection relays, overloads, level settings, pressure settings, etc., shall be set by the Contractor in the presence of the Employer's representative. All the settings shall be recorded by the Contractor for handing over to the Employer's representative after commissioning.
(c) Underload settings or phase angle settings of protection relays, pressure devices, flow monitor devices, level monitoring devices, etc., shall be set under test conditions, with the Contractor on standby, when inlet and/or outlet valves are closed and opened on pumps.
(d) Telemetry signals and/or remote controls shall be tested to ensure that level controls for emptying and/or filling of reservoirs function correctly.
(e) Other safety and/or remote starting and stopping devices shall be tested for correct functioning.
(f) The plant shall be stopped when the Employer's representative is satisfied with all tests and all connections and after operation of the plant for the number of hours as required by the Employer's representative. This period is normally not shorter than 4 hrs. Terminals in panels and at motors (power and controls) shall then be checked for tightness.
(g) Any small items such as alterations to labels, faulty ammeters, etc. shall be recorded for repairs.
(h) The number of required maintenance and operational manuals (complete in all respects) shall be handed over to the Employer's representative. (Refer to the Project Specifications for requirements of manuals)
(i) The switchboards and all instruments shall be clean and neat.
(j) All lights and power points shall be operative, and all earthing and bonding shall be completed and tested.
(k) A Certificate of Compliance shall have been handed to the power supply authority with a copy on site for the Employer's representative.
(l) The Contractor shall hand to the Employer's representative all the test results of cables, earthing, switchgear, etc. which was logged by him together with the settings of all protection equipment, control equipment, level sensing equipment, circuit breakers, etc. This information shall be made available on properly structured test sheets and log sheets and shall be dated and signed by the Contractor.
(m) The Contractor shall then proceed with training of the operating personnel of the Employer as may be required in the Project Specification.

No last-minute repairs or installation work shall be done by the Contractor on the day of "wet commissioning" of the Works. The successful completion of all the above shall be the "wet commissioning" of the Works and shall be regarded as the "first hand over day" of the Works to the User or Owner of the installation.

The retention period of the Works normally starts on that day, unless abnormal conditions prevent the handing over of the Works to the Client. An abnormal occurrence that prevents handing over will not be seen as failure of the Contractor in this respect. If the commissioning should have to be stopped or abandoned due to the failure of the Contractor to complete the Works and have the Works ready for inspection or if the Works has not gone through the "dry commissioning" procedures as stated or through the "wet commissioning" procedures as stated above, then the further costs for re-commissioning later will be for account of the Contractor. Such costs will include all the

traveling, accommodation and time rate costs of the Employer's representatives. The commissioning shall be regarded as incomplete until all tests have been conducted successfully and all datasheets of

tests have been completed and all drawings have been updated to show any deviation from factory-built equipment details.

3. Training

Training provided by the Contractor shall be directly applicable to the actual equipment to be used at the installation. All training shall be carried out on site, unless otherwise requested by the Employer.

Training is normally required as follows and should be undertaken with the manuals and documentation indicated previously, available on site.

(a) Training of operators.
(b) Maintenance training of technical staff.
(c) Software training (related to SCADA computer - primary course only for operation of SCADA).

The above training sessions will be separate sessions, with the personnel with the appropriate skill-levels attending the specific sessions.
Training shall include the training of technical personnel of the Employer during the installation period and commissioning stages of equipment on site to make the technical staff and or skilled operators completely conversant with the installed equipment and the use thereof. The Employer thus reserves the right to appoint certain staff to the Contractor's team during the installation and commissioning phases of the works.

4. Certification by the Employer's Representative

The following certificates must be issued by the Employer's Representative

(a) Practical Completion of Works
(b) Certificate of Commissioning (after successful commissioning of the Works have been attained)

(c) Final Approval of Works (at the beginning of the guarantee and retention period). The date of Issue of this certificate may be the same date of the "Certificate of Commissioning.

5. Certification by the Contractor

The Contractor shall issue the necessary completion certificates and Certificates of Compliance to the Employer's representative and the applicable Authorities as per SANS 10142: Part 1: Low Voltage Installations, or as required in terms of the Occupational Health and Safety Act, Act 85 of 1993, as and when required by the Employer's representative or the Authorities. The certificates shall include the Certificate of Compliance as would be required by SANS 10142 (latest amendment) where any 231/400 Volt (or higher voltage) work is carried out by the Contractor.

None of the certificates of the Employer's representative, as specified hereinbefore will be issued if the Contractor does not comply with the requirements of this clause. Until the Certificates of Compliance is issued by the Contractor, the Employer's representative will not consider issuing of a Certificate of Completion. The original Certificate of Compliancy for every separate site or installation shall be handed to the Employer. Copies must be issued to the Employer's representative and the Supply Authority and copies can further be included in the Operational and Maintenance manuals.

VAAL CENTRAL WATER

CONTRACT NO. VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

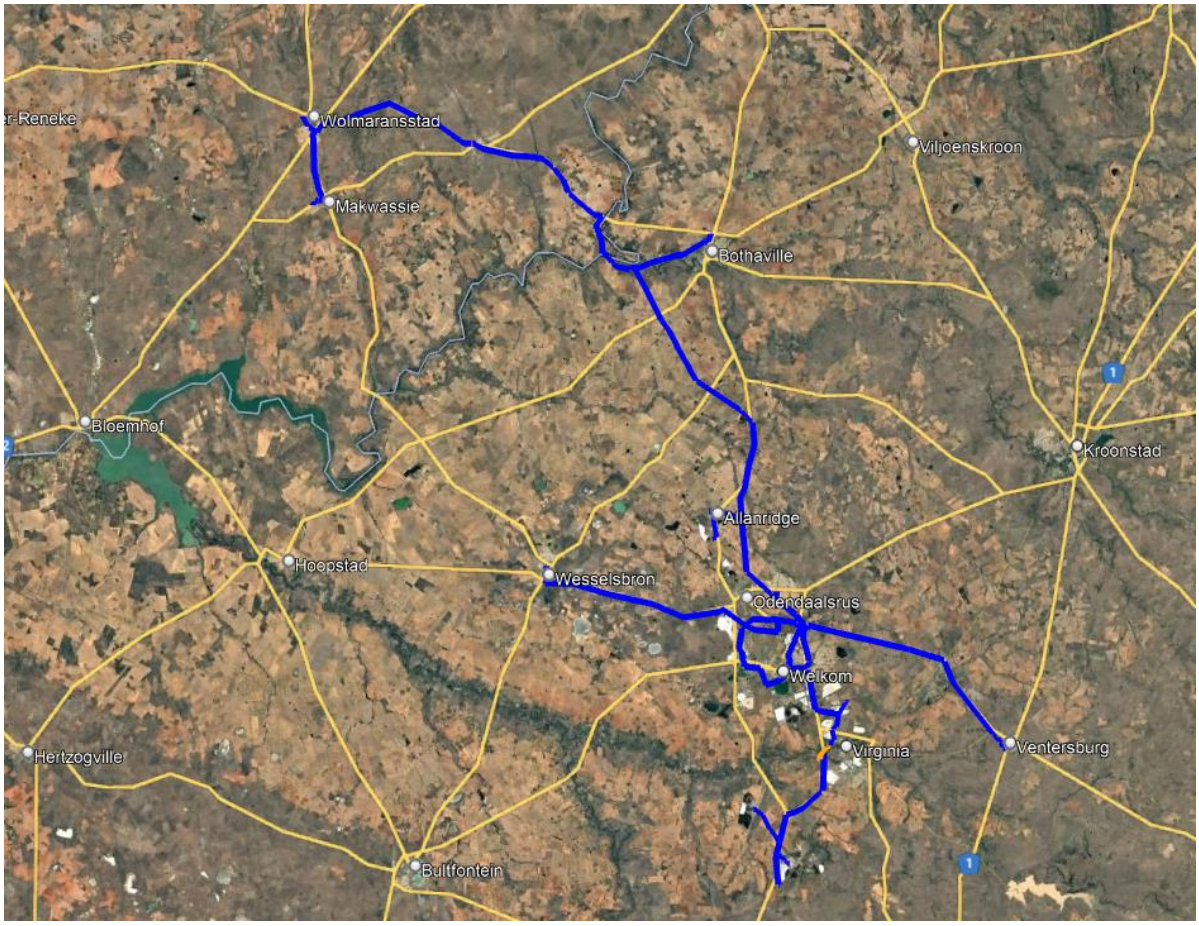
PART C4: SITE INFORMATION

1. SITE INFORMATION

1.1 DESCRIPTION OF SITE AND ACCESS

The Smart water meter project is located within the jurisdiction of the Nala Local Municipality Matjabeng and Nala Municipality, Free State Province, South Africa.

Figure 1: Site Location



Contractor	Witness 1	Witness 2	Employer	Witness 1	Witness 2

VAAL CENTRAL WATER

CONTRACT NO: VCW402/MCV/NFS/25

INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

ANNEXURE B: ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL MANAGEMENT PLAN

REVISION 0

PROJECT DESCRIPTION: INSTALLATION OF SMART BILLING WATER METERS, SMART CHAMBERS AND VALVES FOR THE VAAL CENTRAL WATER: NORTHERN FREE STATE REGION

Contract Number: VCW402/MCV/NFS/25

PREPARED FOR

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1. Definitions

Alien Species: Plants and animals, which do not occur naturally in an area – they are brought in by humans. Alien plants often force indigenous species out of the area.

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, design alternatives, temporal alternatives or the 'do nothing' alternative.

Best Practicable Environmental Option: The option that provides the most benefits or results with the least damage to the environment as a whole at a cost acceptable to society in the short- and long term.

Conservation: Protecting, using and saving resources wisely, especially the biodiversity found in an area

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g., discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

Drainage line: A drainage line is a lower category or order of watercourse that does not have a clearly defined bed or bank. It carries water only during or immediately after periods of heavy rainfall i.e. non-perennial and riparian vegetation may or may not be present

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Ecosystem: A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

Emissions: The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into the environment (land, surface water, groundwater and air).

Environment: the surroundings within which humans exist and that are made up of:

i. The land, water and atmosphere of the earth;
ii. Micro-organisms, plant and animal life;

iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: A plan that organizes and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Expansion: means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

General waste: Waste which does not pose an immediate hazard or threat to health or to the environment' and includes the following waste flows: domestic waste, construction and demolition waste, business waste, insert waste.

Habitat: The place in which a species or ecological community occurs naturally.

Hazardous waste: Waste that has the potential to cause a negative threat/impact to humans and/or the environment. It includes, but is not limited to, batteries, neon lights, fluorescent lights, printer cartridges, oil, paint, paint containers, oil filters, IT equipment etc.

Indirect impacts: Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place as a result of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Maintenance: means actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint.

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.

Significant impact: An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Waste: As per National Environmental Management: Waste Act means-

a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or

b) disposed of, or that is intended or required to be discarded or disposed of, by the holder of that
substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or

c) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste.

Wetland: land which is transitional between terrestrial and aquatic systems were where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstance support vegetation typically adapted to life in saturated soil.

Watercourse: as per the National Water Act means -

(a) a river or spring;

(b) a natural channel in which water flows regularly or intermittently;

(c) a wetland, lake or dam into which, or from which, water flows;

(d) and any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

2. Purpose

This document describes the main environmental management requirements that the Contractor must comply with during the construction and commissioning phase to ensure that the environment is considered, negative impacts avoided or minimised, and positive impacts enhanced. It also gives details on issues that will be obliging in ensuring effective compliance. This document is critical to the main Contractor and the Contractor's Environmental Officer (EO) as well as any sub-contractors reporting to the main Contractor.

The purpose of this Document is to:

- Describe how project environmental risks will be managed during the construction phase;
- Detail the roles and responsibilities of all parties with respect to environmental management during construction;
- Outline the organisational structure for effective implementation of CEMP;
- Assist the Contractor in understanding the requirements of comply with the CEMP and any relevant specifications; and
- Provide a set of standards for environmental management during the construction phase.

3. Scope of Application

The standard applies to Contractors that will work on site under the authority of the Vaal Central Water. The EMPr is a lifecycle document for the project and considers the mitigation of detrimental impacts as per National Environmental Management principles. This document will act as a legally controlling document to the service providers/ contractors and sub- contractors working on site throughout to the operational phase of the development. This document should be implemented by the developer as well as all service providers/contractors and subcontractors appointed must be obliged to apply the principles set out in this document. In the event of environmental damage caused by any action, process or negligence by the developer, service providers / contractors and sub-contractors, it is the responsibility of the person who caused the damage to rectify and rehabilitate the affected environment at own cost, in line with the 'polluter pays' principle and be liable for any fines issued by the authorities.

4. Abbreviations/Definitions

CEMP	Construction Environmental Management Plan.
Contractor	The Principal Contractor as engaged by Vaal Central Water for infrastructure construction operations, including all sub-contractors appointed by the main contractor for the execution of parts of the construction operations
Contractor's Environmental Officer	Contractor's Environmental Officer responsible for ensuring compliance with the CEMP on a daily basis.
ECO	Environmental Control Officer (ECO). Independent environmental officer who monitors compliance with the CEMP.
Environment	Surroundings in which the Contractor operates, including air, water, land, natural resources, flora, fauna, humans and their interrelations.
Environmental Aspect	Element of a Contractor's activities, products or services that can interact with the environment and cause an environmental impact (e.g. dust, noise etc.)
Environmental Impact	Any chance to the environment, whether adverse or beneficial, wholly or partially resulting from a Contractor's activities, products or services.
Environmental Risk	The product of the likelihood and severity of an unforeseen occurrence/ incident/ aspect and the impact it would have, if realised, on the environment.
SES	Standard Environment Specification which describes a set minimum environmental standards for all construction sites.

Project Manager	Means the overall project manager responsible for implementation of the project.
Environmental Manager	Works together with the Project Management and Engineer to ensure that the requirements of the CEMP/SES are met.
Engineer	Works together with the Project Manager to ensure that construction proceeds in accordance with the relevant specifications and agreed schedule.
Environmental Officer	Person responsible for ensuring that the CEMP is implemented by the project/construction team and Contractors and their Sub-contractors.

5. Overview of the Construction Environmental Management Plan

It is the goal of the developer to implement sustainable environmental management practices throughout all project stages. This will apply to the planning, design, construction, operation, restoration, reuse and decommissioning activities related to all infrastructure development. The CEMP is the tool used to ensure this goal is achieved during the construction and commissioning phases. Some decommissioning may occur during site clearing in brownfield sites and this CEMP will also apply to those activities.

The CEMP has been developed in line with the requirements of all relevant South African Environmental Legislation and Standards of Best Practice.

5.1. Applicable Legislation

Several laws and regulations apply to the protection of the environment and contain environmental principles and standards that need to be applied and permits and licences that need to be obtained. This EMPr will be subject to regulatory control under a range of State, Provincial and Local regulations. Such legislation largely embraces pollution prevention, resource use and conservation, and socio cultural (heritage) protection. This chapter reviews legislation pertaining to the proposed development.

Key environmental legislations that are applicable to the project are listed below, but are not limited to;

- National Environmental Management Act (Act No. 107 of 1998)
- National Environmental Management: Biodiversity Act (Act 10 of 2004)
- National Water Act (Act No. 36 of 1998)
- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
- National Environment
- Management Protected Areas Act, 2003 (Act No. 57 of 2003).
- National Environmental Management: Air Quality Act, Act 39 of 2004
- National Heritage Resources, Act 25 of 1999
- Occupational Health and Safety Act (No 85 of 1993)

6. Roles Responsibilities & Organizational Structure

6.1. Environmental Management: Roles and Responsibilities

6.1.1. Project Manager (PM)

The PM will be responsible for ensuring that the CEMP and associated specifications or requirements are complied with during construction.

The specific tasks during the construction and commissioning stage will include:

- Liaison with the authorities.
- Ensure environmental criteria are incorporated in tenders during tender evaluation and adjudication thereof.
- Review all reports from the Environmental Specialist/Officer, including sign off on Methods Statements.
- Conduct any environmental incident enquiries.
- Identify, with support from the Engineer, the need for corrective or remedial measures with regards to proposed works.
- Ensure induction material includes project appropriate environmental issues.
- Approve training programmes and other awareness initiatives.
- Coordinate or facilitate internal environmental audits.
- Prepare environmental monitoring protocols.

6.1.2. Engineer

The Engineer has overall responsibilities for environmental management on site which includes the implementation of the CEMP, SES, permits and licenses and reports to the Project Manager. The Engineer is supported by the PM.

The specific environmental tasks during the construction phase will include:

- Reviewing the monthly reports compiled by the Environmental Officer.
- Communicating directly with the Contractors.
- Issuing non-conformance notification to Contractors that do not comply with the requirements of the CEMP and associated requirements or documents, including EAs, EMPr, permits and licenses.

6.1.3. Environmental Control Officer

The Environmental Control Officer reports to the Engineer and PM and is responsible for conducting the tasks required to ensure that the CEMP and SES including permits and licences are implemented on the construction site.

The Environmental Control Officer will conduct the following tasks:

- Ensure that environmental issues receive adequate attention in the site induction training.
- Prepare and conduct awareness training (e.g. posters, tool box talks and signage).
- Conduct monthly observation & inspections and audit of all work places.
- Monitor the Contractor's compliance with the EA, EMPr, CEMP and any permits and licences on site.
- Conduct monthly observations and environmental audits of all Contractor's and work areas.
- Ensure that all environmental monitoring programmes (sampling, measuring, recording etc. when specified) are carried out according to protocols and schedules.
- Measurement of completed work (e.g. areas top soiled, re-vegetated, stabilised etc.).
- Maintain site documentation related to environmental management (permits, CEMP, method statements, EA, reports, audits, monitoring results, receipts for waste removal etc.). Documentation to be maintained on the relevant site Document Control System.
- Attendance at scheduled SHE meetings and project coordination meetings.
- Inspect and report on environmental incidents and check corrective action.
- Keep a regular photographic record of all environmental incidents.
- Implementation of environmental-related actions arising out of the minutes from scheduled meetings.
- Management of complaints register.
- Review and Sign off Method Statements prepared by Contractor's.
- Audit Environmental Method Statements.
- Collate information received including monitoring results into a monthly report to the Engineer showing progress against targets.
- The compilation of the Project Environmental Management File.

The key deliverables will include the compilation of:

- Project Start Up Checklist
- Monthly inspection/ environmental audit report
- Monitoring results
- Site close-out reports
- Incidents reports
- Environmental Incident Register
- Environmental Non-Conformance Register
- Complaints Register
- Method Statements Register
- Hazardous Substances Register
- Site Close-out Inspection

6.1.4. Contractor`s Environmental Officer

Contractor will appoint an Environmental Officer whose role is to ensure implementation of the CEMP and SES where applicable. The Contractor will submit the name and CV of the Environmental Officer as well as an Environmental Plan detailing roles and responsibilities with their tender submission. This will be for the ECO's approval and no work can commence on site if this has not been done.

The Contractor's Environmental Plan will include, but not be limited to:

- Description of environmental management responsibilities of the Contractor's Project Manager, Contractor's Site Manager and the Contractor's Environmental Officer
- Organisational Environmental Policy
- Environmental Method Statements
- CEMP
- SES

The Contractor's Environmental Officer will liaise with the Environmental Control Officer on site. It will be the responsibility of the Contractor's Environmental Office to ensure that all work is conducted according to approved Environmental Method Statements and that the roles and responsibilities as set out in this document are fulfilled. The Contractor's Environmental Officer tasks will include:

- Daily, weekly and monthly inspections of the work area(s) as per schedule or authorise through written instruction by the Engineer or Environmental Control Officer. The Contractor is referred to Section 8 for an example of the items that will need to be inspected, and which items will be audited by the Environmental Control Officer.
- Prepare activity/aspect based Environmental Method Statements.
- Identify local, provincial and national environmental legislation that applies to Contractor's activities.
- Monitor compliance with the CEMP, SES and Environmental Method Statements.
- Ongoing Environmental Awareness training of the Contractor's site personnel.
- Reporting, investigating and recording of any environmental incidents caused by the Contractor or due to the Contractor's activities, including their sub-contractors.
- Close out of environmental incidents.
- Attendance at all SHE meetings and induction programmes, and toolbox talks where possible.
- Waste Management.
- Ensure that environmental signage and barriers are correctly placed.
- Taking required corrective action within specified time frame.

The Contractor's Environmental Officer will be expected to submit daily, weekly and monthly checklists to the Environmental Control Officer.

Should the Contractor's Environmental Officer change from that person identified during either tender stage, or construction period, the Contractor will submit a CV of a replacement Environmental Officer for approval by the Environmental Control Officer and Engineer. No Work can proceed until the replacement Environmental Officer has been approved.

6.2. Organizational Structure

The organisational structure identifies and defines the responsibilities and authority of the various entities involved in the project. All instructions and official communications regarding environmental matters will follow the organisational structure defined in this document.

All instructions that relate to the CEMP will still be given to the Contractor via the Engineer. In an emergency situation, however, the Environmental Control Officer may give an instruction directly to the Contractor. Environmental Management of the site will be an item on the agenda of the monthly site meetings and the Environmental Control Officer will attend these meetings. If at any time the Engineer is uncertain in any way with respect to an environmentally related issues or any specification in CEMP, he will consult with the Environmental Control Officer.

6.3. The Contractor

The Contractor will comply with the requirements of the CEMP and abide by the Engineer`s instructions regarding the implementation of the CEMP.

The Declaration of Understanding, as detailed in Section 7, must be signed, and a signed copy must be submitted to the Engineer prior to the start of construction.

Section 7 details some of the main actions required by the Contractor at various stages during the contract. The Environmental Control Officer will monitor that all of these actions are undertaken in accordance with the CEMP.

It must be noted, however, that Section 7 does not list all the requirements of the CEMP, but rather serves as a guide as to where definite actions are required before certain activities can commence. It should be read in conjunction with the SES.

Section 8 contains aspects that will be subject to regular inspections and audits by the various parties.

7. Matters Pertaining to Implementation of the CEMP

7.1. Availability of the CEMP

Copies of the relevant CEMP documentation (SES and any Contractor`s Guideline Documents) will be available at the site offices of the Contractor and/or on site.

7.2. Project Environmental Management Plan

The Contractor is required to submit an Environmental Management Programme (EMPr) with his Tender Documents. The EMPr should describe the relevant roles and responsibilities and how potential environmental risks will be assessed and managed including the monitoring and recording thereof. These will be used to establish a Contractor`s competency and experience of preventing and managing potential environmental impacts.

7.3. Environmental Method Statements

Environmental Method Statements are written submissions by the Contractor to the Engineer and Environmental Control Officer describing:

- The proposed activity, setting out the plant, equipment, materials, labour and method the Contractor proposes using to carry out an activity.
- Transportation of the equipment to and from the site.
- How the equipment/material will be moved while on site.
- How and where material will be stored.
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur.
- Timing and location of activities.
- Description of potential positive and negative environmental impacts and how they will be managed.
- Compliance/non-compliance with the Standard Environmental Specification and any other statutory and best practice standards.
- Monitoring and reporting requirements.
- Any other information deemed necessary by the Engineer.

The Contractor will compile Activity-/Aspect-based Environmental Method Statements for all activities proposed. The Environmental Method Statements will enable the potential positive and negative environmental impacts associated with the proposed construction activity to be identified and mitigation measures put in place. All method statements must be signed by the Contractor, thereby indicating that the works will be carried out according to the methodology described therein.

Activities may only commence once the Environmental Method Statements have been approved by the Environmental Control Officer and Engineer. In some instances, local authorities may also need to approve the method statements. This will be highlighted in the Project Environmental Specification, if applicable.

All changes to the original Method Statements must be approved by the Environmental Control Officer and Engineer prior to implementation. The Contractor will also be required to re-sign the amended Environmental Method Statement.

To enable timely approvals, the environmental method statements will be submitted to the Engineer and Environmental Control Officer for review two weeks prior to the intended date of commencement of the activity, or as directed by the Engineer.

Where changes to the work methodology are proposed, Environmental Method Statements must be amended accordingly and signed off by all relevant parties as indicated above. This Environmental Method Statements MUST contain sufficient information and detail to enable the Engineer and Environmental Control Officer to apply their minds to the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him/her in order to undertake the works.

The initial Environmental Method Statements required for submission and approval are listed in this environmental specification. Others may be requested by the Engineer and Environmental Control Officer during the Contract.

7.4. Environmental Incidents and Non-Conformances

In the event of an environmental incident, the Contractor will follow the following procedure:

- Step 1: Immediately take all reasonable measures to contain and minimise the effects of the incident, including its effect on the environment and any risks posed by the incident to the health, safety and property of persons.
- Step 2: Notify the Environmental Control Officer in writing including the following information: the nature of incident and initial classification; substances involved with quantities; initial measures taken to minimise impacts; causes of the incident; measures taken and proposed to avoid the reoccurrence of the incident;
- Step 3: Include the incident on the ECO's Incident Register.
- Step 4: Undertake clean-up procedures.
- Step 5: Remedy the effects of the incident; and
- Step 6: Assess the immediate and long-term effects of the incident on the environment and on public health.

In the event of any level 1 or 2 environmental incidents, the Contractor's Environmental Officer must complete the Environmental Control Officer Incident Report.

In the event of any Level 1 or 2 environmental incidents, the Environmental Control Officer will:

- Ensure that an Incident Flash Report has been compiled and that it contains the necessary information.
- Ensure that the Contractor has complied with Sections 6.1 and 6.2 of the Occurrence Reporting and Investigation Procedure; and
- Report, record, investigate and analyse the incident and communicate the required action plans to be implemented to the Engineer as specified in Section 6.6 of the above-mentioned procedure.

An environmental incident is classified under four levels: 1, 2, 3, and 4 defined as follows:

7.4.1. Level 1 Environmental Incident

An incident of sequel of incidents, whether immediate or delayed, that result or has the potential to result in:

- A significant impact on the physical or biological environment (air, ground, water and habitat) with extensive or long-term impairment of ecosystem function or surface and ground water resources.
- An inconvenience/disturbance/disruption/annoyance (including odour, dust, noise, traffic problem, loss of water supply) of a long duration or with a long-term impact on interested and affected parties. A release of material (gas, liquid or solid) or energy that will cause chronic illness, permanent lost time injury, fatality or extensive property damage experienced by interested and affected parties.
- Irreparable damage to highly valued structures and sacred locations.
- Public or national / international media outcry.
- Instances where inspections undertaken by or for the regulator to check legal compliance, were found to be outside the permitted limits and have resulted in prosecution.
- Any incident with NEMA section 30(1) – and/or NWA section 20(1) reporting requirements (In the event where all administrative requirements have been complied with and the incident has been closed out by the authorities, it may be re-classified as a lower-level incident)

Where the environmental impact of a Level 2 environmental incident is still present 120 days after occurrence, the incident will be reclassified as a Level 1 incident.

Note: A level 1 environmental incident usually should be reported to the authorities, usually result in a significant pollution and may entail risk of public danger. Level 1 environmental incidents usually cause an irreversible impact even with the involvement of long-term external intervention i.e. expertise, best available technology, remedial actions, excessive financial cost etc.

7.4.2. Level 2 Environmental Incident

An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in:

A moderate impact on the physical or biological environment (air, ground, water or habitat) with limited impairment of ecosystem function and/or surface and ground water resources.

- An inconvenience disturbance/disruption/annoyance (including odour, dust, noise, traffic problems, loss of water supply) of moderate or with medium effect on interested and affected parties.
- A release of material (gas, liquid, solid) or energy that causes severe but reversible illness, non-lost time injury or moderate property damage experienced by interested and affected parties.
- Damage to rare structures of cultural significance or significant infringement of cultural values / sacred locations.
- Attention from local media or widespread complaints.
- Instances where inspections undertaken by or for the regulator to check legal compliance have been outside the permitted limits and an official pre-directive or directive was issued.
- Inability of Contractors to close out corrective actions without proper reason.

Where the environmental impact of a Level 3 environmental incident is still present 3 days after occurrence, the incident will be reclassified as a Level 2 incident.

Note: A level 2 environmental incident may be reported to the authorities, can result in significant pollution or may entail risk of public danger. The impact of Level 2 environmental incidents should be reversible within a short to medium term with or without intervention.

7.4.3. Level 3 Environmental Incident

An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in:

- A minor impact on the physical or biological environment (air, ground, water or habitat), with no significant or long-term impairment to the ecosystem function or surface/ ground water resources.
- An inconvenience / disturbance / disruption / annoyance (including odour, dust, noise, traffic problem, loss of water supply) of short duration and with no long –term effect on the employees and the community.
- A release of material (gas liquid, solid) or energy that has the potential to cause illness, or that causes short term discomfort or reversible health effect to be interested and affected parties.
- Isolated complaints by interested and affected parties.

- Instance where inspections undertaken by or for the regulator to check for legal compliance have been outside the permitted limits and an official pre-directive or directive was issued.
- Blatant negligence of the CEMP & SES leading to the issuing of an NCR

NOTE: A level 3 environmental incident is not reportable to authorities, should not result in pollution and may not have a risk of public danger. The impact of Level 3 environmental incidents should be insignificant immediately after occurrence and/or once-off intervention on the day of occurrence.

7.4.4. Level 4 Environmental Incidents

A minor incident with lesser significance that did not necessarily result in damage or injury but that had the potential to cause damage to the environment, including:

- Could result in service disruption with a lesser significance.
- Did not necessarily result in damage.
- Had the potential, under different circumstances, to cause major damage to the environmental.

Or:

Instances where inspections undertaken internally by the ECO to check for conformance with their Environmental Government Framework have been outside the required limits (e.g. an environmental compliance score of less than 80%).

7.4.5. Non-Conformances

A non-conformance may be issued to the Contractor by the Resident Engineer/Environmental Control Officer where:

- The incident response procedure described above (include administrative requirements) were not successful implemented; or
- There are repeated incidents because of inadequate environmental practices on site.
- Documentation required to comply with the CEMP is not prepared or maintained adequately on site; or
- Any non-compliance with the requirements of the Environmental Authorisations, the CEMP and Environmental Specifications are identified.

7.5. Documentation and Records

The Environmental Control Officer will ensure that the Contractor's Environmental Officer is supplied with all required/applicable documents listed in the ECO's Contents for Contractors Environmental File.

The Contractor's Environmental Officer will complete and maintain copies of all documents and records and ensure that these documents and records are kept up to date.

The Contractor's Environmental Officer will submit these documents to the Environmental Control Officer on a monthly basis except where documents have remained unchanged in which case written notification to this effect must be provided to the Environmental Control Officer.

Once the Environmental Control Officer has conducted a site closure inspection and notified the Contractor that site closure will be granted, all documents described above must be handed over to the ECO after which a Site Closure Certificate will be issued.

Note: All documents/records are to be retained for a period of 10 years.

8. Main Actions Required by the Contractor to Comply

8.1. Prior to commencement

The Engineer must ensure that the requirements below are requested of the Contractor in the Project Construction Contract Document, the Letter of Appointment and any other relevant correspondence with the Contractor prior to the start of works, as relevant.

8.1.1. Declaration of Understanding (DoU)

The Declaration of Understanding must be signed and provided by the Contractor as part of his Tender Document. The signed DoU is a written confirmation by the Contractor that the requirements of the CEMP are understood and will be complied with for the duration of their works on site.

The proforma DoU to be signed by the Contractor has been included.

8.1.2. Appointment of Contractor's Environment Officer

The Contractor will appoint an Environmental Officer or assign to a competent person roles and responsibilities for environmental management during construction. The Contractor will forward details of the appointment to the ECO for their review and approval. Should the Contractor's Environmental Officer or the person originally assigned with responsibilities for environmental management change from that person identified during either the tender stage, or the construction period, the Contractor will submit the details of such appointment or assignment for the ECO's approval. No working will proceed until the new Environmental Officer is assigned or appointed.

8.1.3. Environmental Management Plans and Method Statements

The Environmental Management Plan and Environmental Method statements must meet the requirements of the CEMP. These include, but are not limited to, the following where applicable:

- Establishment of construction lay down area

- Hazardous and non-hazardous waste management
- Storm water management
- Handling, storage and management of hazardous substances
- Contaminated water management
- Hydrocarbon spills
- Diesel tanks and refuelling procedures
- Dust control
- Spoil dump
- Sourcing, excavating, transporting and dumping of fill material
- Noise and vibration control
- Removal of rare, endemic or endangered species
- Rodent and pest control
- Environmental awareness training
- Site division (demarcation of the site)
- Emergency procedures of environmental incidents
- Closure of construction laydown area

Emergency construction activity Environmental Method Statement may also be required. The activities requiring Environmental Method Statements cannot commence if they have not been approved by the Resident Engineer or Environmental Control Officer.

8.1.4. Environmental Induction

The Contractor must ensure that all management, foremen and the general workforce, as well as all sub-contractors, suppliers and visitors to site have attended the Environmental Induction Programme prior to commencing any work on site. Where new personnel commence work on site during the construction period, the Contractor must ensure that these personnel also undergo the Induction Programme and are made aware of the environmental specifications on site. The Contractor must ensure that all of their personnel understand the requirements of the EMPr as relevant to their scope of work.

8.2. During the construction period

8.2.1. Copy of the CEMP and familiarisation thereof

A copy of the EMPr must be available on site and the Contractor will ensure that all personnel on Site (including sub-contractors and their staff) as well as suppliers are familiar with and understand the specifications contained in these documents.

8.2.2. Compliance with the EMPr

Compliance with ensure that all sections of the EMPr (where relevant) must be compiled with during the construction period.

8.2.3. Site Clean-Up for Closure

Retention moneys will not be paid until a Site Closure Inspection (conducted by the Environmental Control Officer) has taken place and signed off by the Engineer and PM together with the Site Closure Certificate.

9. Environmental Inspections and Audits

Environmental inspections and audits shall be conducted using five basic techniques:

- Interviews with Contractor's staff including sub-contractors and suppliers;
- Document checks ;
- Observations;
- Monitoring; and
- Measurement and verification.

For each construction project, the auditor and auditee are as follows:

Place	Inspector / Auditor	Auditee	Inspection/audit Frequency
Work places	Contractor's Environmental Officers	Contractor's Team	Daily/Weekly Inspection
Construction Site	Environmental Control Officer	Contractor's Environmental Officer	Monthly Audit
Construction Site (Entire area)	Environmental Specialist	Entire Project	As required

9.1. Workplaces Inspection

The Contractor's Environmental Officer will be required to conduct weekly inspections of all work places for which the Contractor is responsible, including but not limited to the following:

- Contractor's camp, recreational and canteen facilities
- Material lay down areas
- Liquid and solid waste storage facilities(general, hazardous, recycling and scrap)
- Workshops
- Oil traps
- Wash bays
- Construction work area
- No-go areas

- Storm water drains
- Any other construction area for which the SHE officer is responsible.

At each of these sites, the Contractor's Environmental Officer will be required on a daily basis to check for the following, where relevant:

By Observation:

- Litter
- Separation of solid waste as per system
- Hydrocarbon spills
- Effectiveness of dust control measures
- Illegal washing out of containers in drains
- Correct usage and wastage
- Pollution of rivers / watercourses
- Provision and use of toilet facilities
- Any other illegal activities

By Document check:

- Removal of oil for recycling as per schedule
- Removal of packaging as per agreements with suppliers
- Removal of hazardous waste by specialist Contractors as per schedule
- Correct placement of environmental signage and posters
- Document board listing emergency numbers, hazmat info sheet, etc.

The following records must also be kept up to date (information must include that of sub-contractors where relevant):

- Fuel consumption for entire contract measured in litres (including plant, generators, other equipment, vehicles etc.)
- Electricity consumption for entire contract measured in Watt hours.
- Quantities of general waste submitted for recycling measured in kilograms
- Quantities of general waste disposed of to landfill measured in kilograms
- Quantities of hazardous waste disposed of to landfill measured in kilograms
- Water consumption, including water used for construction and human consumption measured in litres.

9.2. Construction Site Audit

The Environmental Control Officer will be required to conduct monthly inspections of the entire construction site, which may involve more than one Contractor and may include, but not be limited to the following:

- Entire site
- Fencing
- Environmentally sensitive areas
- Contractor's camp, recreational and canteen facilities
- Material lay down areas
- Scrap yard
- Workshops
- Oil traps
- Wash bays
- Sewage plant
- Quarries and borrow pits used for fill and construction material
- Spoil dumping areas
- Solid waste disposal areas
- Liquid waste disposal areas
- Bioremediation site
- Area for the temporary storage of hazardous waste
- Fuel depot and hydrocarbon storage areas
- Construction work area
- Concrete batching plant
- Spray booths
- Haul roads
- No-go areas
- Storm water drains
- And any other construction areas not listed

At each of these sites, the Environmental Control Officer will be required to check for the following, where relevant:
By Observation:

- Litter
- Separation of solid waste per system
- Hydrocarbon spills
- Use of bunding, hard standing and other protection measures
- Illegal dumping
- Effectiveness of dust control measures
- Illegal washing out of containers in drains
- Wash bay drainage systems are working
- Correct usage of drip trays
- Effectiveness of oil separators
- Illegal use of tracks and off-road driving in no-go areas
- Correct procedures are followed for topsoil removal and stockpiling
- Effectiveness of erosion protection measures

- Excess noise and vibration
- Water use and wastage
- Pollution of rivers / watercourses
- Provision and used of toilet facilities
- Any other illegal

By Document check:

- All receipts for the collection of old oil, general recycled waste and hazardous waste
- Correct placement of environmental signage and posters
- Document board list emergency numbers, hazmat info sheets, etc.
- Complete and accurate record of Contractor's Environmental File

By Measurement:

- Amount of water used by each Contractor (where practical)
- Amount of topsoil removed and stockpiled
- Amount of land stabilisation completed
- Area re-vegetated
- Amount of waste recycled, sent to scrap yard or disposed in dump
- Amount of material treated in the bioremediation site

By Monitoring:

- Effectiveness of dust control systems
- Effectiveness of pollution control systems
- Effectiveness of rehabilitation and re-vegetation programmes
- Effectiveness of noise control barriers

A site-specific inspection checklist will be provided to the Environmental Officer prior to site establishment and a specific site audit protocol will be formulated.

The Contractor will be required to achieve the minimum requirement for environmental audits. The standard/minimum requirement for all environmental audits is 90% and where a compliance score of less than 90% has been achieved, nonconformance reports (NCRs) will be issued to the Contractor.

10. Records

All environmental records/documents generated during the construction phase of the project will be managed in terms of Vaal Central Water's Document Management Procedure for records retention.

11. Overview of the Standard Environmental Specifications (SES)

This procedure describes the minimum standards for environmental management to which Contractors and sub-contractors on a construction site must comply. It is a generic standard for use across all construction works executed by Vaal Central Water.

This document must be read in conjunction with the Construction Environmental Management Plan (CEMP).

11.1. Standards for Environmental Management

The Contractor shall identify the potential environmental impacts that may occur as a result of his/her activities and accordingly prepare separate Method Statements describing how each of these impacts will be prevented or managed so that the standards set out in this document are achieved. These Method Statements will be prepared in accordance with the requirements set out in the CEMP.

The Contractor will comply with the standards described below.

11.1.1. Site Planning and Establishment

The Contractor shall establish his construction camps, offices, workshops, staff accommodation and any other facilities on the site in a manner that does not adversely affect the environment. These facilities must not be sited close proximity to sensitive areas.

11.1.1.1. Site Plan

Before the onset of construction, the Contractor shall submit to the Engineer and ECO for approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the Contractor proposes to put in place.

The Site Plan must as a minimum include but not be limited to:

- Detailed layout of the construction works areas including access roads, site offices, material laydown areas, temporary stockpile areas and parking areas.
- Detailed locality and layout of all waste storage and handling facilities for litter, kitchen refuse and workshop-derived effluents.
- Proposed areas for the stockpiling of topsoil and excavated spoil material.
- Demarcation of the construction footprint including areas not to be disturbed by the development.
- Location of sewage and sanitary facilities at the site offices and staff accommodation and all localities on the site where there will be a concentration of labour. Sanitary arrangements should be to the satisfaction of the Engineer
- The site offices should not be cited in close proximity to steep areas. It is recommended that the offices, and in particular the ablution facilities, aggregate

stockpiles, spoil areas and hazardous material stockpile be located as far away as possible from any watercourse as possible.

11.1.1.2. Identification and Establishment of Suitable Access Routes/Roads

Existing access routes to the construction/works area must be used as far as possible. The building of access roads must be restricted to within the development footprint to prevent unnecessary disturbance of the surrounding environment. Access tracks must be maintained in a good condition at all times during construction to minimise erosion and dust generation.

11.1.1.3. Demarcation of Site Limits

Prior to the commencement of construction, the actual site to be developed must be clearly demarcated by means of highly visible barriers such as fences and orange snow netting. Vegetation within the demarcated zone may be cleared. Disturbance of vegetation outside of the demarcated development footprint is not permitted.

All plant, material and equipment required for construction must be located within the designated areas. Laydown areas must be clearly demarcated within the site limits. No activities are allowed outside of the demarcated development footprint.

11.1.1.4. Eating Areas

The Contractor is responsible for providing temporary shade areas within the works area to ensure that workers do not leave the site to eat during working hours. Refuse bags must be provided at all established eating areas.

11.1.1.5. Effluent Management

All effluent water from site shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water courses (streams, rivers, pans, dams, etc.) Only domestic type wastewater shall be allowed to enter the designated system.

11.1.2. Sewage and Sanitation

The Contractor is responsible for providing adequate sanitary facilities to all workers on site and for enforcing the proper use of these facilities. Safe and effective sewage treatment will require one of the following sewage handling methods: septic tanks and soak-aways, dry-composting toilets such as "enviro loos", or the use of chemical toilets which are supplied and maintained by a suitably qualified sub-contractor. The type of sewage treatment will depend on the location of the site and the surrounding land uses, the duration of the contract and proximity (availability) of providers of chemical toilets. Should a soak-away system be used, it shall not be closer than 100 metres from any natural water course or water retention system. The waste material generated from these facilities shall be serviced on a regular basis.

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on the works. Use of open area (i.e. the veldt) shall not, under any circumstances, be allowed.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. The toilets shall also be placed outside areas susceptible to flooding and high winds. The Contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such facilities in a clean, orderly and hygienic condition to the satisfaction of the Engineer.

The Contractor shall ensure that there are separate toilet facilities for male and females on site at a ratio of one facility for every 10 employees.

11.1.3. Waste Management

Waste is grouped into "general" or "hazardous", depending on its characteristics. The classification determines handling methods and the ultimate disposal of the material.

General waste to be expected during construction includes the following;

- Trash (wastepaper, plastics, cardboard, etc.) and food waste from offices, warehouses and construction personnel
- Uncontaminated construction debris such as used wood and scrap metal
- Uncontaminated soil and non-hazardous rubble from excavation or demolition

Hazardous waste means any waste that contains organic or inorganic elements or compounds that may, owing to its inherent physical, chemical characteristics, such as toxic, ignitable, corrosive, carcinogenic other properties or toxicological characteristics of that waste have a detrimental impact on health and the environment.

The Contractor shall classify all wastes expected to be generated during the construction period.

Examples of typical construction waste which could be expected on the site and how they should be classified are indicated in the following table:

Table 1: Example of Construction Waste Classification.

WASTE	CLASSIFICATION	
	HAZARDOUS	GENERAL
Aerosol containers	X	
Batteries, light bulbs, circuit boards, etc.	X	X
Clean soil		X
Construction debris contaminated by oil or organic compounds	X	

WASTE	CLASSIFICATION	
	HAZARDOUS	GENERAL
Domestic waste		X
Empty drums (depends on prior use)	X	X
Empty paint and coating containers		X
Explosive waste	X	
PCB waste	X	
Rubble (not contaminated by oil or organic compounds)		X
Waste cable		X
Waste plastic		X
Waste paint and/or solvent	X	
Waste oil	X	
Waste concrete		X
Waste containing fibrous asbestos	X	
Waste timber		X
Sewerage sludge	X	
Scrap metal		X
Chemically derived sanitary waste	X	

A hierarchical control approach to waste management is encouraged. Waste should preferably be managed in the following order of preference:

1. Avoidance: using goods in a manner that minimises their waste components.
2. Reduction: reduction of the quantity and toxicity of waste generated during construction.
3. Re-use: removing an article from a waste stream for use in a similar or different purpose without changing its form or properties.
4. Recycling: separating articles from a waste stream and processing them as products or raw materials.
5. Recovery: reclaiming particular components or materials or using the waste as a fuel.
6. Treatment: processing of waste by changing its form or properties in order to reduce toxicity and quantity.
7. Disposal: burial, deposit, discharge, abandoning or release of waste.

The Contractor is responsible for the removal of all waste from site generated through the Contractor`s activities. The Contractor shall ensure that all waste is removed to appropriate licensed waste management facilities. (For the identification of an appropriate facility, the following source may be utilized: www.sawic.org.za).

The Contractor shall manage HAZARDOUS WASTE anticipated to be generated by his operations as follows:

- Characterise the waste to determine if it is general or hazardous.
- Obtain and provide an acceptable container with correct classification label.
- Place hazardous waste material in allocated container.
- Inspect the container on a regular basis as prescribed by the Contractor's waste management plan.
- Track the accumulation time for the waste.
- Haul the full container to the disposal site.
- Provide documentary evidence of proper disposal of the waste.

The Contractor`s Environmental Officer will work in conjunction with the Contractor`s construction safety and industrial hygiene personnel to create a Hazardous Materials Management Program. This program will establish the necessary protocol for proper handling and removal of hazardous materials on the site.

Information on each hazardous substance will be available to all persons on site in the form of Material Safety Data Sheets (MSDS). Training and education about the proper use, handling, and disposal of the material will be provided to all workers handling the material.

The Contractor`s Environmental Officer must be informed of all activities that involve the use of hazardous substances to facilitate prompt response in the event of a spill or release.

The Contractor shall manage GENERAL WASTE that is anticipated to be generated by operations as follows:

- Determine if waste is non-hazardous and obtain containers for waste storage.
- Notify waste hauler when container is full so that it can be removed and replaced with an empty.
- No littering is allowed on site. In the event where staff mobility is high, refuse bags will be made available by the Contractor.
- Provide documentary evidence of proper disposal of waste

The Contractor shall recycle GENERAL WASTE (as far as practically possible) that is anticipated to be generated by its operations as follows:

- Obtain and label recycling containers for the following (whichever relevant) and locate within temporary office building and trailers:
  - Office Waste;
  - Aluminium;
  - Steel;
  - Glass;
  - Ferrous Metals; Non-Ferrous Metals; and
  - Waste Timber

- Establish recycled material collection schedule.
- Arrange for full bins to be hauled away.

Spent batteries, circuit boards, and bulbs, while non-hazardous, require separate storage, special collection and handling.

No burning, burying or dumping of waste of any kind will be permitted.

The Contractor shall quantify all waste disposed of, whether general or hazardous (including waste disposed of by any subcontractors) and keep record of these quantities on site.

11.1.4. Workshops, equipment maintenance and storage

Al vehicles and equipment must be kept in good working order to maximize efficiency and minimise pollution. Maintenance, including washing and refuelling of plant on site must be done at designated locations at workshop areas. These designated areas must be agreed with the Engineer and Environmental Control Officer. The Contractor must ensure that no contamination of soil or vegetation occurs around workshops and plant maintenance facilities. All machinery servicing areas must be bunded. Drip trays should be used to collect used oil, lubricants and other during maintenance. Drip trays must be provided for all stationary plant. Washing of equipment should be restricted to urgent maintenance requirements only. Adequate wastewater collection facilities must be provided.

11.1.5. Vehicle and Equipment Refuelling

11.1.5.1. Stationary/Designated Refuelling

No vehicles or machines shall be serviced or refuelled on site except at designated servicing or refuelling locations. No oil or lubricant changes shall be made except at designated locations, or in case of breakdown or emergency repair.

The Contractor shall store fuel and oil at a secure area, which shall be bunded to contain 110% of the total volume within the bund and designed with an impervious layer or liner or paved surface to prevent spillage from entering the ground.

The Contractor shall provide details of its proposed fuel storage and fuelling facility to the Environmental Control Officer for approval. The design shall comply with the regulations of the National Water Act, (Act 36 of 1998), the Hazardous substances Act, (Act 15 of 1973), the Environmental Conservation Act, (Act 73 of 1989), and the Occupational Health and Safety Act, (Act 85 of 1993), mainly the Construction – and Hazardous Chemical Substances Regulations.

11.1.5.2. Mobile Refuelling

In certain circumstances, the refuelling of vehicles or equipment in a designated area is not a viable/practicable option and refuelling has to be done from a tank, truck or

container moved around on site. In such circumstances, the Contractor may request approval from the Engineer to conduct mobile refuelling subject to the following control measures:

- Secondary containment equipment shall be in place. This equipment shall be sized to contain the most likely volume of fuel that could be split during transfer.
- Absorbent pads or drip trays are to be placed around the fuel inlet prior to dispensing.
- Mobile refuelling units are to be operated by a designated competent person.
- The transfer of fuel must be stopped prior to overflowing. Fuel tanks or refuelling equipment on vehicles may only be filled to 90% carrying capacity.
- Mobile fuelling tanks must be stored in an area where they are not susceptible to collisions. The fuel storage area must be located away from drainage channels.
- Mobile refuelling operations shall not take place within 15 meter of any residential buildings, or 7.5 meter from other structures, property lines, public ways or combustible storage.
- All mobile refuelling tanks are to be properly labelled and fire extinguishers shall be located near the fuel storage areas. These extinguishers must be of a suitable type and size.

11.1.6. Spill Response

The Contractor shall have adequate spill response materials/equipment on site which must be aligned with the volumes of hazardous substances used on site and the risk of pollution to sensitive environmental attributes.

The Contractor shall provide details for approval by the Engineer of its spill response plan in the event of any spills of fuel, oils, solvents, paints or other hazardous materials. The plan will show measures to be taken in removing contaminated material from site and demonstrate complete removal of contamination.

The Contractor shall instruct construction personnel on the following spill prevention and containment responsibilities:

- Immediately repair all leaks of hydrocarbons or chemicals
- Take all reasonable means to prevent spills or leaks
- Do not allow sumps receiving oil or oily water to overflow
- Prevent storm water runoff from contamination by leaking or spilled drums of oil or chemicals
- Do not discharge oil or contaminants into storm water or sewer systems

If a spill occurs on land, the Contractor must:

- Immediately stop or reduce the spill
- Contain the spill
- Recover the spilled product

- Remediate the site
- Implement actions necessary to prevent the spill from contaminating groundwater or off-site surface water □ Dispose of contaminated material to a location designated thereto

Any spill to water has the potential to disperse quickly; therefore, the spill must be contained immediately using appropriate containment equipment.

If a spill to water occurs, the Contractor must:

- Take immediate action to stop or reduce the spill and contain it
- Notify the appropriate on-site authorities
- Implement actions necessary to prevent the spread of the contamination by deploying booms and/or absorbent material
- Recover the spilled product
- Properly dispose of spilled material

11.1.7. Spray Painting and Sandblasting

Spray painting and sandblasting should be kept to a minimum. All painting should, as far as practicable, be done before equipment and material is brought on site. Touch-up painting is to be done by hand painting or by an approved procedure. A Method Statement shall be submitted to the Environmental Control Officer for approval.

The relevant Contractor will inform his Environmental Officer of when and where spray painting or sandblasting is to be carried out prior to commencement of work. The Environmental Officer will monitor these activities to ensure that adequate measures are taken to prevent contamination of the soil.

If the area is in confined or high (elevated) area, a protection plan must be issued for approval.

11.1.8. Dust Management

Material in transit should be loaded and contained within the load bin of the vehicle in such a way as to prevent any spillage onto the roads and the creation of dust clouds. If necessary, the bin of the vehicle shall be covered with a tarpaulin to prevent dust.

Dust is to be controlled on unpaved access roads and site roads using sprayed water. Contractors are responsible for managing dust generated as a result of their activities.

Some dust control measures which are normally applied during construction are presented in this section for inclusion by the Contractor in his Dust Control Method Statement:

- Operate vehicles within speed limits, where no speed limit has been specified the limit shall be 20 km/h
- Wash paved surfaces within the construction area twice a week

- Minimise haulage distances
- Apply water to gravel roads with a spraying truck when required
- Environmentally friendly soil stabilisers may be used as additional measures to control duct on gravel roads and construction areas
- Dust suppression measures will also apply to inactive construction areas. (An inactive construction site is one on which construction will not occur for a month or more).
- Construction material being transported by trucks must be suitably moistened or covered to prevent dust generation
- Minimise disturbance of natural vegetation during right-of-way construction (e.g. transmission lines and erection of fences) to reduce potential erosion, runoff, and air-borne dust.
- Implement as system of reporting excessive dust conditions by construction personnel (as instructed through Environmental Awareness Training).

Water for dust control shall only be taken from approved sources.

11.1.9. Storm Water and Dewatering Management

The Contractor shall be aware that, apart from runoff from overburden emplacements and stock piles, storm water can also be contaminated from batch plants, workshops, vehicle wash-down pads, etc., and that contaminants during construction may include hydrocarbons from fuels and lubricants, sewerage from employee ablutions and excess fertiliser from rehabilitated areas, etc.

The Contractor shall take note that discharges to controlled waters such as the sea, rivers, and groundwater or to sewerage systems are controlled under South African Water Legislation.

The following specific measures are required:

- Temporary drainage must be established on site during the construction period until permanent drainage is in place. Contractors are responsible for maintaining the temporary drainage in their areas. Contractors must provide secondary drainage that prevents erosion.
- Contractors must employ good housekeeping in their areas to prevent contamination of drainage water.
- The Contractor shall clear stagnant water.
- The Contractor shall ensure that no contaminated surface water flows off-site as a result of Contractor operations. Silt traps shall be constructed to ensure retention of silt on site and cut-off ditches shall be constructed to ensure no runoff from the site except at points where slit traps are provided. The Contractor shall be responsible for checking and maintaining all silt traps for the duration of the project.
- If applicable, the Contractor shall be responsible for collection, management, and containment within the site boundaries of all dewatering from all general site preparation activities. The dewatering water shall be contained within the site boundaries by sequentially pumping or routing water to and from sub-area within the site as the construction activities precede. No discharge/dewatering to off-site land or surface water bodies will be allowed.

- On-site drainage shall be accomplished through gravity flow. The surface drainage system shall consist of mild overland slopes, ditches, and culverts. The graded areas adjacent to buildings shall be sloped away with a 5 %. Other areas shall have a minimum slope of 0.2% or as otherwise indicated.
- Ditches shall be designed to carry a 25-year storm event with velocities in accordance to minimise erosion. Erosion protection shall consist of suitable stabilising surfaces in all ditches.
- Culverts shall be designed to ensure passage of the 50-year storm peak runoff flow.

11.1.10. Erosion Control

Both structural and non-structural (vegetative) erosion control measures will be designed, implemented, and properly maintained in accordance with best management practices which will include the following:

- Scheduling of activities to minimise the amount of disturbed area at any one time
- Implementation of re-vegetation as early as feasible
- Limiting construction traffic and/or avoidance thereof on access roads and areas to be graded to the extent feasible at drainage ditches
- Compacting loose soil as soon as possible after excavation, grading, or filling
- Using slit fences, geo-textiles, temporary rip-rap, soil stabilisation with gravel, diversionary berms or swales, small sedimentation basins, and gravelled roads to minimise transport of sediment
- Implementing the erosion and sedimentation control plan and ensuring that construction personnel are familiar with and adhere to it
- Managing runoff during construction
- The Contractor shall be responsible for checking and maintaining all erosion and sedimentation controls

11.1.11. Rehabilitation

Contractors shall rehabilitate the entire site upon completion of work. A rehabilitation plan will be submitted to the Engineer for approval at least six weeks before completion. The following are critical issues to be included in the rehabilitation plan:

- Details of soil preparation procedures including proposed fertilisers or other chemicals being considered for use
- A list of the plant species that will be used in the rehabilitation process. Note that these should all be indigenous species, and preferably species that are endemic to the area. The assistance of an appropriately qualified botanist should be sought in developing this list.
- Procedures for watering the planted areas (frequency of watering, methodology proposed, etc.)
- An indication of the monitoring procedures that will be put in place to ensure the successful establishment of the plants (duration and frequency of monitoring, proposed criteria for declaring rehabilitation as being successful).

- Procedures for the prevention of the establishment and spread of alien invasive species.

11.1.12. Noise Management

- Keep all equipment in good working order
- Operate equipment within its specification and capacity and don`t overload machines
- Apply regular maintenance, particularly with regards to lubrication
- Operate equipment with appropriate noise abatement accessories, such as sound hoods
- Sensitive social receptors shall be notified of any excessive noise-generating activities that could affect them
- Ensure that the potential noise source will conform to the South African Bureau of Standards recommended code of practice, SANS 10103:2004, so that it will not produce excessive or undesirable noise when released
- All the Contractor`s equipment shall be fitted with effective exhaust silencers and shall comply South African Bureau of Standards recommended code of practice, SANS 10103:2004, for construction plant noise generation
- All the Contractor`s vehicles shall be fitted with effective exhaust silencers and shall comply with the Road Traffic Act, (Act 29 of 1989) when any such vehicle is operated on a public road
- If on-site noise control is not effective, protect the victims of noise (e.g. earplugs) by ensuring that all noise-related occupational health provisions are met (Occupational Health and Safety Act, (Act 85 of 1993)).

11.1.13. Protection of heritage resources

11.1.13.1. Archaeological Sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The Contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery inform the engineer of such a discovery. The South African Heritage Resources Agency (SAHRA) is to be contacted and will appoint an archaeological consultant. Work may only resume once clearance is given in writing by the archaeologist.

11.1.13.2. Graves and middens

If a grave or midden is uncovered on site, or discovered before the commencement of work, all work in the immediate vicinity of the graves/middens shall be stopped and the Engineer informed of the discovery. The National Monuments Council should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with the National Monuments Council, be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred.

11.1.14. Fire Prevention

Fires shall only be allowed in facilities or equipment specially constructed for this purpose. A firebreak shall be cleared and maintained around the perimeter of the camp and office sites. All conditions incorporated in the requirements of the Occupational Health and Safety Act shall be implemented.

11.1.15. Water Protection and Management

No water shall be abstracted form any water resource (stream, river, or dam) without the express permission of the Engineer. Such permission shall only be granted once it can be shown that the water is safe for use, that there is sufficient water in the resource to meet the demand, and once permission has been obtained from the Department of Water Affairs in accordance with the requirements of the National Water Act (Act 36 of 1998).

Water for human consumption shall be available at the site offices and at other convenient locations on site. The generally acceptable standard is that a supply of drinking water shall be available within 200 m of any point on the construction site.

The Contractor shall keep record of the quantities of water used during construction (including use by sub-contractors), irrespective of the purpose of use.

11.1.16. Protection of Fauna and the collection of firewood

On no account shall any hunting or fishing activity of any kind be allowed. This includes the setting of traps, or the killing of any animal caught in construction works.

On no account shall any animal, reptile or bird of any sort be killed. This specifically includes snakes or other creatures considered potentially dangerous discovered on site. If such an animal is discovered on site an appropriately skilled person should be summoned to remove the creature from site. Consideration should be given to selection and nomination of such a person prior to site establishment. If no-one is available, training should be provided to at least two site staff members.

The Contractor shall provide adequate facilities for all his staff so that they are not encouraged their comforts on site by accessing what can be taken from the natural surroundings. The Contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

11.1.17. Environmental Awareness Training

An Environmental Awareness Program is considered a necessary part of the Construction Environmental Management Plan for the Project. Training of the appropriate construction personnel will help ensure that all environmental regulations and requirements are followed which must be defined in the relevant Method Statement to be prepared by the Contractor.

Objectives of environmental awareness training are:

- Environmental Management – protecting the environment from the effects of construction by making personnel aware of sensitive environmental resources.
- Regulatory compliance – complying with requirements contained in project-specific permit conditions, also complying with requirements in regional and local regulations.
- Problem recognition and communication – training personnel to recognise potential environmental problems, i.e. spills, and communicate the problem to the proper person for solution.
- Liability control – non-compliance with regulatory requirements can lead to personal and corporate liability.

All individuals on the Project construction site will need to have a minimum awareness of environmental requirements and responsibilities. However, not all need to have the same degree of awareness. The required degree of knowledge is greatest for personnel in the Safety, Health and Environmental Sections and the least for the manual personnel.

The Contractor shall present environmental awareness programmes on a weekly/bi-monthly basis and keep record of all the environmental related training of the personnel.

11.1.18. Handling and Batching of Concrete and Cement

Concrete batching shall only be conducted in demarcated areas which have been approved by the Engineer.

Such areas shall be fitted with a containment facility for the collection of cement-laden water. This facility shall be bunded and have an impermeable surface protection so as to prevent soil and groundwater contamination. Drainage of the collection facility will be separated from any infrastructure that contains clean surface runoff.

The batching facility will not be placed in areas prone to floods or the generation of stagnant water. Access to the facility will be controlled to minimise potential environmental impacts.

Hand mixing of cement and concrete shall be done on mortarboards and/or within the bunded area with impermeable surface or concrete slab.

Bulk and bagged cement and concrete additives will be stored in an appropriate facility at least 10 m away from any watercourse, gullies and drains.
Wastewater collected in the containment facility shall be left to evaporate. The Contractor shall monitor water levels to prevent overflows from the facility. Water can be pumped into sealed drums for temporary storage and must be disposed of as liquid hazardous waste.

All concrete washing equipment, such shovels, mixer drums, concrete chutes, etc. shall be done within the washout facility.
Water used for washing shall be restricted as afar as practically possible.

Ready-mix concrete trucks are not allowed to wash out anywhere other than in an area designated for this purpose.

The Contractor shall periodically clean out hardened concrete from the wash-out facility or concrete mixer, which can either be reused or disposed of as per accepted waste management procedures.

Empty cement and bags, if temporarily stored on site, must be collected and stored in weatherproof containers. Used cement bags may not be used for any other purpose and must be disposed of on a regular basis in accordance with the Contractor`s solid waste management system.

Sand and Aggregates containing cement will be kept damp to prevent the generation of dust.

Concrete and cement or any solid waste materials containing concrete and cement will be disposed of at a registered disposal facility. Where disposal facilities for general waste are utilised, written consent from the relevant municipality must be obtained.

11.1.19. Stockpiling, Soil Management and Protection of Flora

Clearance of vegetation shall be restricted to that which is required to facilitate the execution of the works.

Stockpiling may only take place in designated areas indicated on the approved site layout plan. Sensitive areas shall be avoided in this regard.

The Contractor shall measure the extent of all areas cleared for construction purposes and keep this figure updated.

Any area to be used for stockpiling or material laydown shall be stripped of all topsoil. Vegetation clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible.

The detail of vegetation clearing shall be subject to the Engineer`s approval and shall occur in consultation with the Environmental Control Officer.

Stockpiles must be positioned in areas sheltered from the wind and rain to prevent erosion and dispersion of loose materials.

Stockpiled soil shall be protected by adequate erosion-control measures.

Soil stockpiles shall be located away from drainage lines, watercourses and areas of temporary inundation.

Topsoil shall be stockpiled separately from other materials and kept moist.

Excavated subsoil, where not contaminated, must be used for backfilling and topsoil for landscaping and rehabilitation of disturbed areas.

Where topsoil has become mixed with subsoil or is not up to the original standard, fertiliser or new topsoil shall be provided by the Contractor.

Stockpiles (excluding ballast stockpiles) shall not exceed 2 m in height unless otherwise permitted by the Engineer.

No vegetation located outside the construction site shall be destroyed or damaged.

As far as is reasonably practicable, existing roads must be used for access to site and right of way.

Before site clearance takes place, vegetation surveys will be conducted and protected species identified.

No protected plant species shall be removed without written consent from the relevant authorities.

The development of new embankments or fill areas must be undertaken in consultation with the Environmental Control Officer.

No dumping of solid waste or refuse shall be allowed within or adjacent to areas of natural vegetation.

The Contractor shall identify and eradicate all declared alien and invasive plant species occurring on site.

11.1.20. Traffic Management

Vehicles are not permitted to leave access roads.

Turning of vehicles should only take place within a clearly demarcated "turn area" located within the approved construction footprint.

The Contractor must co-ordinate the loading and offloading of material during the construction phase so as to ensure that vehicular movement is in one direction only at any on time and that side-tracks are not created on the site.

Vehicles should only be parked within designated parking areas as demarcated on the site layout plan.

11.1.21. Transportation of Materials

The Contractor is responsible for ensuring that all suppliers and delivery drivers are aware of procedures and restrictions (e.g. no-go areas) in terms of the CEMP and this Specification. Material must be appropriately secured to ensure safe passage between destinations during transportation. Loads must have appropriate cover to prevent spillage from the vehicles. The Contractor will be held responsible for any clean-up resulting from the failure to properly secure transported materials.

11.1.22. Borrow Pits and Quarries

The Contractor shall make use of commercial suppliers for all rock and sand raw materials.

The Contractor shall ensure that any supplier is in possession of the required permit/license and keep record of the quantity of material supplied.

The Contractor will not make direct use of any borrow pits and quarries unless he has obtained written approval from the Engineer and Method Statement has been submitted.

The abovementioned Method Statement will provide the detailed description of the location of the borrow pits and/or quarries and the procedures that will be followed to adhere to any pertinent national or local legislation (e.g. mineral extraction, safety and noise levels).

11.1.23. Social and Labour Issues

The criteria for and selection of labourers, sub-contractors and suppliers for the project shall demonstrate preference for the local community and shall be aligned with the criteria set by Vaal Central Water in appointing the Contractor. The Contractor shall keep records of the identity of all staff.

Under no circumstances shall the Contractors engage in formal discussions with landowners without prior consent by the Engineer.

No activity on private property shall be allowed without written consent by the relevant landowner.

Any damage to private property caused by the Contractor during the construction period shall be repaired to the satisfaction of the Engineer.

The Contractor shall keep record of any complaint raised during the construction period relating to the Contractor`s activities.

No jobseekers shall be allowed on site.

11.1.24. Energy Management

The Contractor shall measure and keep updated records of the following:

- Electricity consumption (to be measured in Watt Hours)
- Fuel consumption (to be measured in litres)

11.1.25. Handling, Storage and Management of Hazardous Substances

All hazardous materials/substances shall be stored in a second, designated area that is fenced and has restricted entry.

All storage shall take place using suitable containers to the approval of the Engineer.

All hazardous liquids shall be located in a secure, demarcated area and an adequate bund wall (110% of the total volume stored) shall be provided. The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled/leaked liquids into the soil.

No possible spillages or accumulated stormwater within this bunded area will be allowed to be flushed from the bund into the surrounding area. All fluids accumulated within the bunded area shall be removed and disposed of in accordance with Section 3.3.

Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure.

Weigh bills of hazardous substances shall be sources from suppliers and kept on site for inspection by the Environmental Control Officer.

The Contractor must provide a method statement detailing the hazardous substances that are to be used during construction, as well as the storage, handling and disposal procedures for each substance. Emergency procedures in the event of misuse or spillage that might negatively affect the environment must be specified.

(3) ANNEXURE A1: DECLARATION OF UNDERSTANDING – VAAL CENTRAL WATER

DECLARATION OF UNDERSTANDING

I, _____

representing_____

declare that I have read and understood the contents of the Environmental Management Programme for

Contract:_____

I also declare that I am able and shall comply with all legislation pertaining to the nature of work to be done and all things incidental thereto.

I further declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

_____

Signed:

_____

Place:

_____

Date:

_____

Witness 1:

_____

Witness 2:

ANNEXURE A2: DECLARATION OF UNDERSTANDING - CONTRACTOR

DECLARATION OF UNDERSTANDING

I, _____

representing_____

declare that I have read and understood the contents of the Environmental Management Programme for

Contract _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

_____

Signed:

_____

Place:

_____

Date:

_____

Witness 1:

_____

Witness 2:

BILL OF QUANTITY: NORTHERN FREE STATE SMART WATER BILLING METERS, SMART CHAMBERS AND VALVES (VC-BWTW-B1 D) - PRELIMINARIES AND GENERALS

ITEM NO.	SHORT DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Contract Details				
	Site description: VCW's installation of smart water billing meters, smart chambers and Valves (VC-BWTW-B1 D)				
	All quantities & sizes to be verified by Contractor				
1	**SECTION 1: PRELIMINANARY AND GENERAL**				
1.1	Contractual requirements including all sureties and insurances	Sum	1		R -
1.2	Site establishment	Sum			R -
1.3	Full compliance with Health and Safety requirements for the duration of the works including preparation of risk assessments, safe work procedures, the project Health and Safety File, the Health and Safety Plan, medicals for all workers, the provision of PPE and protective clothing and all other H&S matters that fulfil OHS Act 85 of 1993 and construction regulation	Sum	1		R -
1.4	Removal of site establishment and cleaning of construction site	Sum	1		R -
TOTAL P&GS: Carried to Summary					**R -**

vaal central water naturally

HENRY FAGAN Consulting Engineers & Project Managers

BILL OF QUANTITY: INSTALLATION OF NORTHERN FREE STATE SMART WATER BILLING METERS AND SMART CHAMBERS

ITEM NO.	SHORT DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Contract Details				
	Site description: Matjhabeng & Nala Municipalidies areas.				
	Contractor to verify all sizes & quantities before pricing				
2	**SECTION 2: WATER METERS - MATJHABENG**				
2.1	Supply & Install Riebeeckstad 1 (ID D01) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R -
2.2	Supply and Install Welkom Riebeeckstad 2 (ID D01) DN 300mm to 200mm Concentric Flanged Reducer.	No	1		R -
2.3	Supply and Install Welkom Riebeeckstad 2 (ID D01) DN 200mm VJ Coupling, Bolts and nuts complete	No	1		R -
2.4	Supply & Install Riebeeckstad 1 (ID D01) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R -
2.5	Supply and Install Welkom Riebeeckstad 2 (ID D01) DN 300mm VJ Coupling, Bolts and nuts complete	No	2		R -
2.6	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT)	No	1		R -
2.7	Supply and Install Welkom Riebeeckstad 2 (ID D01) cast concrete slab (3140mmx1800mm) with lifting hooks and Smartlock Lid.	m^2	6		R -
2.8	Supply & Install Riebeeckstad 2 (ID D02) 300mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R -
2.9	Supply & Install Riebeeckstad 2 (ID D02) DN 400mm to 300mm Concentric Flanged Reducer.	No	1		R -
2.10	Supply & Install Riebeeckstad 2 (ID D02) DN 300mm VJ Coupling, Bolts and nuts complete.	No	1		R -
2.11	Supply & Install Riebeeckstad 2 (ID D02) DN 400mm PN 16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R -
2.12	Supply and Install Welkom Riebeeckstad 2 (ID D02) DN 400mm VJ Coupling, Bolts and nuts complete	No	2		R -
2.13	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R -
2.14	Supply and Install Welkom Riebeeckstad 2 (ID D02) cast concrete slab 1800mm dia with lifting hooks and Smartlock Lid.	m^2	3		R -
2.15	Supply & Install Phomolong (ID E19) 250mm Smart Meter Magflo Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R -
2.16	Supply & Install Phomolong (ID E19) DN 250mm VJ Coupling, Bolts and nuts complete.	No	1		R -
2.17	Supply & Install Phomolong (ID E19) DN 250mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R -
2.18	Supply and Install Phomolong (ID E19) DN 250mm VJ Coupling, Bolts and nuts complete.	No	1		
2.19	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R -
2.20	Supply and Install Phomolong (ID E19) cast concrete slab (2000mm dia) with lifting hooks and Smartlock Lid.	m^2	3		
2.21	Supply & Install Hennenman (ID E25) 400mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R -
2.22	Supply & Install Hennenman (ID E25) DN 400mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	1		R -
2.23	Supply and Install Phomolong ID 25 DN 400mm VJ Coupling, Bolts and nuts complete.	No	2		
2.24	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R -
2.25	Supply & Install Hennenman (ID E25) cast concrete slab (2000mm dia) with lifting hooks and Smartlock Lid.	m^2	3		R -
2.26	Supply & Install Ventersburg (ID E26) 100mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R -
2.27	Supply & Install Ventersburg (ID E26) DN 300mm to 100mm Concentric Flanged Reducer.	No	1		R -
2.28	Supply and Install Phomolong (ID E26) DN 100mm VJ Coupling, Bolts and nuts complete.	No	1		R -
2.29	Supply & Install Ventersburg (ID E26) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R -
2.3	Supply and Install Phomolong (ID E26) DN 300mm VJ Coupling, Bolts and nuts complete.	No	2		R -
2.31	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R -

2.32	Supply & Install Ventersburg (1D E26) cast concrete slab (2000mm dia) with lifting hooks and Smartlock Lid.	m^2	3		R	-
2.33	Supply & Install Mmamahabane (ID E27) DN 100mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.34	Supply & Install Mmamahabane (ID E27) DN 300mm to 100mm Concentric Flanged Reducer.	No	1		R	-
2.35	Supply & Install Mmamahabane (ID E27) DN 100mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.36	Supply & Install Mmamahabane (ID E27) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.37	Supply & Install Mmamahabane (ID E27) DN 300mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
2.38	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.39	Supply and Install Welkom Mmamahabane (ID E27) cast concrete slab (2000mm) with lifting hooks and Smartlock Lid.	m^2	3		R	-
2.40	Supply & Install Virginia (Harmony) (ID F01) DN 250mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.41	Supply & Install Virginia (Harmony) ID F01 DN 250mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.42	Supply & Install Virginia (Harmony) (ID F01) DN 250mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
2.43	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.44	Supply & install Virginia (Harmony) (ID F01) cast concrete slab (1200mm dia) fitted with lifting hooks and Smartlock Lid.	m^2	1		R	-
2.45	Supply & Install Virginia (ID F02) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.46	Supply & Install Virginia (ID F02) DN 200mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.47	Supply & Install Virginia ID F02 DN 200mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
2.48	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.49	Supply & Install Virginia (ID F02) cast concrete slab (4000mx4000m) fitted with lifting hooks and Smartlock Lid.	m^2	16		R	-
2.5	Supply & Install Virginia (ID F02) Cast Concrete lid (1000mmx1000mm) fitted with lifting hooks.	m^2	1		R	-
2.51	Supply & Install Welkom (Bronville 1) (ID F03) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.52	Supply & Install Welkom (Bronville 1) (ID F03) DN 200mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.53	Supply & Install Welkom (Bronville 1) (ID F03) DN 200mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
2.54	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.55	Supply & Install Welkom (Bronville 1) (ID F03) cast concrete slab (2900mx1800m) fitted with lifting hooks and Smartlock Lid.	m^2	5		R	-
2.56	Supply & Install Thabong (X5) (ID F25) DN 150mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.57	Supply & Install Thabong (X5) (ID F25) DN 150mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	3		R	-
2.58	Supply & Install Thabong (X5) (ID F25) DN 150mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
2.59	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.6	Supply & Install Thabong (X5) (ID F25) cast concrete slab (2000mx2100m) fitted with lifting hooks and Smartlock Lid.	m^2	4		R	-
2.61	Supply & Install Meloding (ID F28) DN 200mm Smart Meter Magflo Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.62	Supply & Install Meloding (ID F28) DN 200mm PN16 Flanged Gate Valve and spool pipe (TBC	No	2		R	-
2.63	Supply & Install Meloding (ID F28) DN 200mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
2.64	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-

2.65	Supply & Install Meloding (ID F28) cast concrete slab (2000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	4		R	-
2.66	Supply and Install Meloding (ID F28) Cast concrete lid (800mmx800mm) Precast lid fitted with hooks.	m^2	1		R	-
2.67	Supply and Install Meloding (ID F28) Cast concrete lid (1000mmx1000mm) fitted with lifting hooks.	m^2	1		R	-
2.68	Supply and Install Meloding (ID F28) Cast concrete lid (600mm dia) fitted with lifting hooks.	m^2	1		R	-
2.69	Supply & Install Welkom (Bronville 2) (ID F29) DN 250mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.70	Supply & Install Welkom (Bronville 2) (ID F29) DN 250mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.71	Supply & Install Welkom (Bronville 2) (ID F29) DN 250mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
2.72	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.73	Supply & Install Welkom (Bronville 2) (ID F29) cast concrete slab (1500mm dia) fitted with lifting hooks and Smartlock Lid.	m^2	2		R	-
2.74	Supply & Install Thabong (Sewage Farm) (ID F32) DN 100mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.75	Supply & Install Thabong (Sewage Farm) (ID F32) DN 100mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.76	Supply & Install Thabong (Sewage Farm) (ID F32) DN 100mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
2.77	Supply & Install Thabong (Sewage Farm) (ID F32) DN 80mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	1		R	-
2.78	Supply & Install Thabong (Sewage Farm) (ID F32) DN 80mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.79	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.80	Supply & Install Thabong (Sewage Farm) (ID F32) cast concrete slab (2400mm dia) fitted with lifting hooks and Smartlock Lid.	m^2	5		R	-
2.81	Supply & Install Welkom (Ernst Opp Hosp) (ID G01) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.82	Supply & Install Welkom (Ernst Opp Hosp) (ID G01) DN 400mm to 200mm Concentric Flanged Reducer.	No	1		R	-
2.83	Supply & Install Welkom (Ernst Opp Hosp) (ID G01) DN 200mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.84	Supply & Install Welkom (Ernst Opp Hosp) (ID G01) DN 400 mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.85	Supply & Install Welkom (Ernst Opp Hosp) (ID G01) DN 400 mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
2.86	Supply & Install new Welkom (Ernst Opp Hosp) (ID G01) 200mm dia Manhole.	No	1		R	-
2.87	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.88	Supply and Install Welkom (Ernst Opp Hosp) (ID G01) cast concrete slab (4500mmx2300mm) fitted with lifting hooks and Smartlock Lid.	No	1		R	-
2.89	Supply and install Welkom (Ernst Opp Hosp) (ID G01) Cast concrete lid (700mm dia) fitted with hooks.	m^2	1		R	-
2.9	Supply & Install Welkom (Bedelia) (ID G02) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.91	Supply & Install Welkom (Bedelia) (ID G02) DN 400mm to 200mm Concentric Flanged Reducer.	No	1		R	-
2.92	Supply & Install Welkom (Bedelia) (ID G02) DN 200mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.93	Supply & Install Welkom (Bedelia) (ID G02) DN 400 mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.94	Supply & Install Welkom (Bedelia) (ID G02) DN 400 mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
2.95	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.96	Supply & Install Welkom (Bedelia) (ID G02) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	m^2	10		R	-

2.97	Supply and install manhole ring to Raise the 200mm diaeter Manhole.	No	1		R	-
2.98	Supply & Install Welkom (Bedelia) (ID G02) cast concrete to Raise (4500mmx2200mm) Chamber by 500mm above ground.	m^2	10		R	-
2.99	Supply & Install Welkom (Bedelia) (ID G02) cast concrete to Raise (3000mmx2400mm) Chamber by 500m above ground.	m^2	7		R	-
2.100	Supply & Install Welkom (Naudeville) (ID G03) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.101	Supply & Install Welkom (Naudeville) (ID G03) DN 300mm to 200mm Concentric Flanged Reducer.	No	1		R	-
2.102	Supply & Install Welkom (Naudeville) (ID G03) DN 200mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.103	Supply & Install Welkom (Naudeville) (ID G03) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.104	Supply & Install Welkom (Naudeville) (ID G03) DN 300mm VJ Coupling, Bolts and nuts	No	2		R	-
2.105	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.106	Supply & install Welkom (Naudeville) (ID G03) cast concrete slab (2000mmX3300mm) fitted with lifting hooks and Smartlock Lid.	m^2	7		R	-
2.107	Supply and install Welkom (Naudeville) (ID G03) Cast concrete lid (600mm dia) fitted with lifting hooks.	m^2	1		R	-
2.108	Supply and Install Welkom (Naudeville) (ID G03) Cast concrete lid (800mmx800mm) fitted with lifting hooks.	m^2	6		R	-
2.109	Supply & Install Welkom (Cemetery) (ID G04) DN 50mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.11	Supply & Install Welkom (Cemetery) (ID G04) DN 100mm to 50mm Concentric Flanged Reducer.	No	1		R	-
2.111	Supply & Install Welkom (Cemetery) (ID G04) DN 50mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.112	Supply & Install Welkom (Cemetery) (ID G04) DN 100mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	1		R	-
2.113	Supply & Install Welkom (Cemetery) (ID G04) DN 100mm VJ Coupling, Bolts and nuts complete	No	1		R	-
2.114	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.115	Supply & install Welkom (Cemetery) (ID G04) cast concrete slab (2760x1800mm) fitted with lifting hooks and Smartlock Lid.	m^2	5		R	-
2.116	Supply & Install Welkom (John Williams) (ID G05) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.117	Supply & Install Welkom (John Williams) (ID G05) DN 300mm to 200mm Concentric Flanged Reducer.	No	1		R	-
2.118	Supply & Install Welkom (John Williams) (ID G05) DN 200mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.119	Supply & Install Welkom (John Williams) (ID G05) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.120	Supply & Install Welkom (John Williams) (ID G05) DN 300mm VJ Coupling, Bolts and nuts	No	2		R	-
2.121	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.122	Supply & Install Welkom (John Williams) (ID G05) cast concrete slab (2000mx3000m) fitted with lifting hooks and Smartlock Lid.	m^2	6		R	-
2.123	Supply & Install Welkom (John Williams) (ID G05) cast concrete lid (600mx600m) Precast lid fitted with hooks.	m^2	1		R	-
2.124	Supply & Install Welkom (John Williams) (ID G05) cast concrete lid (600mm dia) fitted with lifting hooks.	m^2	1		R	-
2.125	Supply & Install Welkom (John Williams) (ID G05) cast concrete lid (1000mx600m) fitted with lifting hooks.	m^2	1		R	-
2.126	Supply & Install Odendaalsrus 1 (ID G07) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.127	Supply & Install Odendaalsrus 1 (ID G07) DN 450mm to 200mm Concentric Flanged Reducer.	No	1		R	-
2.128	Supply & Install Odendaalsrus 1 (ID G07) DN 200mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.129	Supply & Install Odendaalsrus 1 (ID G07) DN 450mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-

2.130	Supply & Install Odendaalsrus 1 (ID G07) DN 450mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
2.131	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.132	Supply and Install Odendaalsrus 1 (ID G07) cast concrete slab (2000mm dia) fitted with lifting hooks and Smartlock Lid.	m^2	3		R	-
2.133	Supply and Install Odendaalsrus 1 (ID G07) cast concrete lid (1000mmx1000mm) fitted with lifting hooks.	m^2	1		R	-
2.134	Supply and Install Odendaalsrus 1 (ID G07) cast concrete lid (800mmx800mm) fitted with lifting hooks.	m^2	1		R	-
2.135	Supply and Install Odendaalsrus 1 (ID G07) cast concrete lid (730mmx600mm) fitted with lifting hooks.	m^2	1		R	-
2.136	Supply & Install Welkom (Reahola Hostel) (ID G08) 150mm Smart Magflo Meter Isomag WaMSS Scada Web Based (Battery with built in transmission Powered with mA & Pulse output).	No	1		R	-
2.137	Supply & Install Welkom (Reahola Hostel) (ID G08) DN 150mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.138	Supply & Install Welkom (Reahola Hostel) (ID G08) DN 150mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
2.139	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.14	Supply & Install Welkom (Reahola Hostel) (ID G08) cast concrete slab (2200mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	4		R	-
2.141	Supply & Install Welkom (Voorspoed) (ID G09) DN 250mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.142	Supply & Install Welkom (Voorspoed) (ID G09) DN 400mm to 250mm Concentric Flanged Reducer.	No	1		R	-
2.143	Supply & Install Welkom (Voorspoed) (ID G09) DN 250mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.144	Supply & Install Welkom (Voorspoed) (ID G09) DN 400mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.145	Supply & Install Welkom (Voorspoed) (ID G09) VJ Coupling, Bolts and nuts complete.	No	2		R	-
2.146	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.147	Supply & Install Welkom (Voorspoed) (ID G09) cast concrete slab (11000mmx2800mm) fitted with lifting hooks and Smartlock Lid.	m^2	3		R	-
2.148	Supply & Install Welkom (Voorspoed) (ID G09) cast concrete lid (800mmx800mm) fitted with lifting hooks.	m^2	1		R	-
2.149	Supply & Install Welkom (Voorspoed) (ID G09) cast concrete lid (600mm dia) fitted with lifting hooks.	m^2	1		R	-
2.150	Supply & Install Welkom (Manny Circle) (ID G37) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.151	Supply & Install Welkom (Manny Circle) (ID G37) DN 400mm to 200mm Concentric Flanged Reducer.	No	1		R	-
2.152	Supply & Install Welkom (Manny Circle) (ID G37) DN 200mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.153	Supply & Install Welkom (Manny Circle) (ID G37) DN 400mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.154	Supply & Install Welkom (Manny Circle) (ID G37) DN 400mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
2.155	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.156	Supply & Install Welkom (Manny Circle) (ID G37) cast concrete slab (2000mmx2300mm) fitted with lifting hooks and Smartlock Lid.	m^2	5		R	-
2.157	Supply & Install Welkom (Stateway) (ID G41) 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.158	Supply & Install Welkom (Stateway) (ID G41) DN 200mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	1		R	-
2.159	Supply & Install Welkom (Stateway) (ID G41) DN 200mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
2.160	Supply & Install Welkom (Stateway) (ID G41) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.161	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-

2.162	Supply & Install Welkom (Stateway) (ID G41) cast concrete slab (2000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	4		R	-
2.163	Replace Welkom (Stateway) (ID G41) 3 x broken manhole rings.	No	3		R	-
2.164	Supply & Install Welkom (Stateway) (ID G41) cast concrete lid (1600mmx1900mm) fitted with lifting hooks.	m^2	3		R	-
2.165	Supply & Install Welkom (Stateway) (ID G41) cast concrete lid (600mm dia) fitted with lifting hooks.	m^2	1		R	-
2.166	Supply & Install Welkom (Constantia) (ID G42) 300mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.167	Supply & Install Welkom (Constantia) (ID G42) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	1		R	-
2.168	Supply & Install Welkom (Constantia) (ID G42) DN 300mm VJ Coupling, Bolts and nuts	No	2		R	-
2.169	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.170	Supply & Install Welkom (Constantia) (ID G42) cast concrete slab (1600mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	3		R	-
2.171	Supply & Install Thabong (Hospital) (ID G54) DN 100mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.172	Supply & Install Thabong (Hospital) (ID G54) DN 300mm to 100mm Concentric Flanged Reducer.	No	1		R	-
2.173	Supply & Install Thabong (Hospital) (ID G54) DN 100mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.174	Supply & Install Thabong (Hospital) (ID G54) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.175	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.176	Supply & Install Thabong (Hospital) (ID G54) cast concrete slab (2000mmx1700mm) fitted with lifting hooks and Smartlock Lid.	m^2	3		R	-
2.177	Supply & Install Thabong (Hospital) (ID G54) cast concrete slab (600mm Dia) fitted with lifting hooks.	m^2	1		R	-
2.178	Supply & Install Odendaalsrus 2(ID H08) DN 25mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.179	Supply & Install Odendaalsrus 2 (ID H08) DN 25mm isolation Ball Valve.	No	2		R	-
2.180	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.181	Supply & Install Odendaalsrus 2 (ID H08) Cast concrete lid (2000mm dia) fitted with lifting hooks.	m^2	3		R	-
2.182	Supply & Install Allanridge 1 (ID I01) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered).	No	1		R	-
2.183	Supply & Install Allanridge 1 (ID I01) DN 300mm to 200mm Concentric Flanged Reducer.	No	1		R	-
2.184	Supply & Install Allanridge 1 (ID I01) DN 200mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.185	Supply & Install Alanridge 1 (ID I01) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.186	Supply & Install Alanridge 1 (ID I01) DN 300mm VJ Coupling, Bolts and nuts complete.					
2.187	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.188	Supply & Install Allanridge 1 (ID I01) cast concrete slab (3000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	6		R	-
2.189	Supply & Install Allanridge 3 (ID I10) DN 50mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.19	Supply & Install Allanridge 3 (ID I10) DN 50mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.191	Supply & Install Allanridge 3 (ID I10) DN 50mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
2.192	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.193	Supply & Install Allanridge 3 (ID I10) cast concrete slab (3000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	6		R	-
2.194	Supply & Install Nyakalong (ID I13) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.195	Supply & Install Nyakalong (ID I13) DN 200mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.196	Supply & Install Nyakalong (ID I13) DN 200mm VJ Coupling, Bolts and nuts complete.	No	3			

2.197	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.198	Supply & Install Nyakalong (ID I13) cast concrete slab (2500mmx1500m) with lifting hooks and Smartlock Lid.	m^2	4		R	-
2.199	Supply & Install Odendaalsrus (Leeuwbsch) (ID J09) DN 25mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.200	Supply & Install Odendaalsrus (Leeuwbsch) (ID J09) DN 25mm Flanged Isolation Ball Valve.	No	2		R	-
2.201	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.202	Supply & Install Odendaalsrus (Leeuwbsch) (ID J09) cast concrete slab (1000mmx1000mm) with lifting hooks and Smartlock Lid.	m^2	1		R	-
2.203	Supply & Install Virginia (Kitty) (ID L09) DN 100mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.204	Supply & Install Virginia (Kitty) (ID L09) DN 200mm to 100mm Concentric Flanged Reducer.	No	1		R	-
2.205	Supply & Install Virginia (Kitty) (ID L09) DN 100mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.206	Supply & Install Virginia (Kitty) (ID L09) DN 200mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.207	Supply & Install Virginia (Kitty) (ID L09) cast concrete slab (1300mmx1000mm) fitted with lifting hooks and Smartlock Lid.	No	1		R	-
2.208	Supply & Install Virginia (Kitty) (ID L09) cast concrete slab (1300mmx1000mm) fitted with lifting hooks and Smartlock Lid.	m^2	1		R	-
2.209	Supply & Install Virginia (Sewage) (ID L11) DN 25mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.210	Supply & Install Virginia (Sewage) (ID L11) DN 25mm Isolation Ball Valve .	No	2		R	-
2.211	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.212	Supply & Install Virginia (Sewage) (ID L11) cast concrete slab (2000mm dia) fitted with lifting hooks and Smartlock Lid.	m^2	3		R	-
2.213	Supply & Install Virginia (Panorama) (ID L23) DN 200mm Smart Magflo Meter Isomag WaMSS Scada web based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.214	Supply & Install Virginia (Panorama) (ID L23) DN 200mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.215	Supply & Install Virginia (Panorama) (ID L23) DN 200mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
2.216	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.217	Supply & Install Virginia (Panorama) (ID L23) cast concrete slab (2000mm dia) fitted with lifting hooks and Smartlock Lid.	m^2	3		R	-
2.218	Supply & Install Thabong (ID N03) DN 300mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.219	Supply & Install Thabong (ID N03) DN 600mm to 300mm Concentric Flanged Reducer.	No	1		R	-
2.220	Supply & Install Thabong (ID N03) DN 300mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.221	Supply & Install Thabong (ID N03) DN 600mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.222	Supply & Install Thabong (ID N03) DN 600mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
2.223	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.224	Supply & Install Thabong (ID N03) cast concrete slab (2000mm dia) fitted with lifting hooks and Smartlock Lid.	m^2	3		R	-
2.225	Supply & Install Thabong (ID N03) cast concrete lid (670mm x670mm) fitted with lifting hooks.	m^2	1		R	-
2.226	Supply & Install Thabong (Cemetery) (ID N04) DN 400mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.227	Supply & Install Thabong (Cemetery) (ID N04) DN 600mm to 400mm Concentric Flanged Reducer.	No	1		R	-
2.228	Supply & Install Thabong (Cemetery) (ID N04) DN 400mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.229	Supply & Install Thabong (Cemetery) (ID N04) DN 600mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.230	Supply & Install Thabong (Cemetery) (ID N04) DN 600mm VJ Coupling, Bolts and nuts complete.	No	2		R	-

2.231	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.232	Supply & Install Thabong (Cemetery) (ID N04) cast concrete slab (2000mm dia) fitted with lifting hooks and Smartlock Lid.	m^2	3		R	-
2.233	Supply & Install Kutlwanong (ID O01) DN 400mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
2.234	Supply & Install Kutlwanong (ID O01) DN 700mm to 400mm Concentric Flanged Reducer.	No	1		R	-
2.235	Supply & Install Kutlwanong (ID O01) DN 400mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
2.236	Supply & Install Kutlwanong (ID O01) DN 700mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
2.237	Supply & Install Kutlwanong (ID O01) DN 700mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
2.238	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
2.239	Supply & Install Kutlwanong (ID O01) cast concrete slab (2500mm dia) with lifting hooks and Smartlock Lid.	m^2	5		R	-
	Total				**R**	**-**
3	**SECTION 3: WATER METERS - NALA**					
3.1	Supply & Install Monyakeng (ID H21) 250mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output)	No	1		R	-
3.2	Supply & Install Monyakeng (ID H21) DN 250mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
3.3	Supply & Install Monyakeng (ID H21) DN 250mm VJ Coupling, Bolts and nuts complete.	No	3			
3.4	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
3.5	Supply & Install Monyakeng (ID H21) cast concrete slab (3200mmx1800mm) fitted with lifting hooks and Smartlock Lid.	m^2	6		R	-
3.6	Supply & Install Wesselsbron (ID H24) DN 150mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output)	No	1		R	-
3.7	Supply & Install Wesselsbron (ID H24) DN 400mm to 150mm Concentric Flanged Reducer.	No	1		R	-
3.8	Supply & Install Wesselsbron (ID H24) DN 150mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
3.9	Supply & Install Wesselsbron (ID H24) DN 200mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
3.10	Supply & Install Wesselsbron ID H24 DN 200mm VJ Coupling, Bolts and nuts complete.	No	2			
3.11	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT)	No	1		R	-
3.12	Supply & Install Wesselsbron (ID H24) cast concrete slab (1600mmx1800mm) with lifting hooks and Smartlock Lid.	m^2	3		R	-
3.13	Supply & Install Wesselsbron (NCD) (ID H53) DN 150mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output)	No	1		R	-
3.14	Supply & Install Wesselsbron (NCD) (ID H53) DN 150mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
3.15	Supply & Install Wesselsbron (NCD) (ID H53) DN 150mm VJ Coupling, Bolts and nuts	No	3		R	-
3.16	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT)	No	1		R	-
3.17	Supply & Install Wesselsbron (NCD) (ID H53) cast concrete slab (680mmx680mm) with lifting hooks and Smartlock Lid.	m^2	1		R	-
3.18	Supply & Install Bothaville No 1 (ID B12) DN 250mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output)	No	1		R	-
3.19	Supply & Install Bothaville No 1 (ID B12) DN 300mm to 250mm Concentric Flanged Reducer.	No	1		R	-
3.20	Supply & Install Bothaville No 1 (ID B12) DN 250mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
3.21	Supply & Install Bothaville No 1 (ID B12) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
3.22	Supply & Install Bothaville No 1 (ID B12) DN 300mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
3.23	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
3.24	Supply & Install Bothaville No 1 (ID B12) cast concrete slab (1600mmx2280mm)fitted with lifting hooks and Smartlock Lid.	m^2	4		R	-
3.25	Supply & Install Kgotsong 2 (ID M02) DN 250mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
3.26	Supply & Install Kgotsong 2 (ID M02) DN 400mm to 250mm Concentric Flanged Reducer.	No	1		R	-
3.27	Supply & Install Kgotsong 2 (ID M02) DN 250mm VJ Coupling, Bolts and nuts complete.	No	1		R	-

3.28	Supply & Install Kgotsong 2 (ID M02) DN 400mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
3.29	Supply & Install Kgotsong 2 (ID M02) DN 400mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
3.30	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT)	No	1		R	-
3.31	Supply & Install Kgotsong 2 (ID M02) cast concrete slab (2200mm dia) with lifting hooks and Smartlock Lid.	m^2	4		R	-
3.32	Supply & Install Kgotsong 3 (ID M04) DN 150mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
3.33	Supply & Install Kgotsong 3 (ID M04) DN 150mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
3.34	Supply & Install Kgotsong 3 (ID M04) DN 150mm VJ Coupling, Bolts and nuts complete.	No	3			
3.35	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT)	No	1		R	-
3.36	Supply & Install Kgotsong 3 (ID M04) cast concrete slab (2500mmx4500mm) fitted with lifting hooks and Smartlock Lid.	m^2	11		R	-
	Total				**R**	**-**
4	**SECTION 4: WATER METERS - VCW BALKFONTEIN AND VIRGINIA**					
4.1	Supply & Install Balkfontein Raw Water 01 (ID HM01) DN 600mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (230V Powered with mA & Pulse output)	No	1		R	-
4.2	Meter Isolation & Grounding Kit complete	No	1		R	-
4.3	Bolts, nuts & VJ Coupling complete	Sum	1		R	-
4.4	Supply & Install Balkfontein Raw Water 02 (ID HM02) DN 600mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (230V Powered with mA & Pulse output)	No	1		R	-
4.5	Meter Isolation & Grounding Kit complete	No	1		R	-
4.6	Bolts, nuts & VJ Coupling complete	Sum	1		R	-
4.7	Supply & Install Balkfontein Raw Water 03 (ID HM03) DN 600mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (230V Powered with mA & Pulse output)	No	1		R	-
4.8	Meter Isolation & Grounding Kit complete	No	1		R	-
4.9	Bolts, nuts & VJ Coupling complete	Sum	1		R	-
4.10	Supply & Install Balkfontein Raw Water 04 (ID HM04) DN 800mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (230V Powered with mA & Pulse output)	No	1		R	-
4.11	Meter Isolation & Grounding Kit complete	No	1		R	-
4.12	Bolts, nuts & VJ Coupling complete	Sum	1		R	-
4.13	Supply & Install Balkfontein KSB Pumps (ID BM02) DN 600mm Smart Meter Insertion Isomag WaMSS Scada Web Based with built in transmission (230V Powered with mA & Pulse output)	No	1		R	-
4.14	Supply & Install Balkfontein LDS Old Pumps (ID BM05) DN 350mm Smart Insertion Meter Isomag WaMSS Scada Web Based with built in transmission (230V Powered)	No	1		R	-
4.15	Supply & Install Virginia Raw Water (ID VM01) DN700mm Smart Magflo Isomag WaMSS Scada Web Based with built in transmission (230V Powered with mA & Pulse output)	No	1		R	-
4.16	Meter Isolation & Grounding Kit complete	No	1		R	-
4.17	Bolts, nuts & VJ Coupling complete	Sum	1		R	-
4.18	Supply & Install Virginia Final Water (ID VM02) DN 700mm Smart Meter Insertion Isomag WaMSS Scada Web Based with built in transmission (230V Powered with mA & Pulse output)	No	1			
4.19	Supply & Install Beatrix pumps (ID VM09) DN 400mm Smart Meter Insertion Isomag WaMSS Scada Web Based with built in transmission (230V Powered with mA & Pulse output)	No	1			
	Total				**R**	**-**
5	**SECTION 5: WATER METERS - MINES**					
5.1	Supply & Install Freegold/Harmony (ID F04) DN 100mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output)	No	1		R	-
5.2	Supply & Install Freegold/Harmony (ID F04) DN 100mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.3	Supply & Install Freegold/Harmony (ID F04) DN 100mm Bolts, nuts & VJ Coupling complete	No	3		R	-
5.4	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.5	Supply & Install Freegold/Harmony (ID F04) cast concrete slab (4000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	8		R	-
5.6	Supply & Install Freegold/Harmony (ID F04) cast concrete lid (800mmx800mm) with lifting hooks.	m^2	1		R	-

5.7	Supply & Install Freegold/Harmony (ID F04) cast concrete lid (1000mx1000m) with lifting hooks.	m^2	1		R	-
5.8	Supply & Install Freegold/Harmony (ID F05) DN 250mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.9	Supply and Install Freegold/Harmony (ID F05) DN 450mm to 250mm Concentric Flanged Reducer.	No	1		R	-
5.10	Supply and Install Phomolong (ID F05) 250mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
5.11	Supply & Install Freegold/Harmony (ID F05) DN 450mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.12	Supply and Install Phomolong (ID F05) 450mm VJ Coupling, Bolts and nuts complete.	No			R	-
5.13	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT)	No	1		R	-
5.14	Supply & Install Freegold/Harmony (ID F05) cast concrete slab (1000mmx1000mm) fitted with lifting hooks and Smartlock Lid.	m^2	1		R	-
5.15	Supply & Install Freegold/Harmony (ID F18) DN 80mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output)	No	1		R	-
5.16	Supply and Install Freegold/Harmony (ID F18) DN 150mm to 80mm Concentric Flanged Reducer.	No	1		R	-
5.17	Supply & Install Freegold/Harmony IMS (ID F18) DN 80 VJ Coupling, Bolts and nuts complete.		1		R	-
5.18	Supply & Install Freegold/Harmony IMS (ID F18) DN 150mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.19	Supply & Install Freegold/Harmony IMS (ID F18) DN 150 VJ Coupling, Bolts and nuts complete.	No	2		R	-
5.20	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.21	Supply & Install Freegold/Harmony IMS (ID F18) cast concrete slab (2300mm dia) fitted with lifting hooks and Smartlock Lid.	m^2	4		R	-
5.22	Supply & Install Freegold/Harmony (ID F20) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.23	Supply & Install Freegold/Harmony (ID F20) DN 200mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.24	Supply and Install Phomolong (ID F20) DN 200 VJ Coupling, Bolts and nuts complete.	No	3		R	-
5.25	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.26	Supply & Install Freegold/Harmony (ID F20) cast concrete slab (2000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	4		R	-
5.27	Supply & Install Freegold/Harmony Bambani (ID F22) DN 250mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.28	Supply & Install Freegold/Harmony Bambanani (ID F22) DN 250mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.29	Supply & Install Freegold/Harmony Bambanani (ID F22) DN 250 VJ Coupling, Bolts and nuts complete.	No	3			
5.30	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT)	No	1		R	-
5.31	Supply & Install Freegold/Harmony Bambananie (ID F22) cast concrete slab (3000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	6		R	-
5.32	Supply & Install Freegold/Harmony (ID F24) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.33	Supply and Install Freegold/Harmony (ID F24) DN 350mm to 200mm Concentric Flanged Reducer.	No	1		R	-
5.34	Supply & Install Freegold/Harmony (ID F24) DN 250 VJ Coupling, Bolts and nuts complete.	No	1		R	-
5.35	Supply & Install Freegold/Harmony (ID F24) DN 350mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.36	Supply & Install Freegold/Harmony (ID F24) DN 350 VJ Coupling, Bolts and nuts complete.	No	2		R	-
5.37	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT)	No	1		R	-
5.38	Supply & Install Freegold/Harmony (ID F24) cast concrete slab (2000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	4		R	-
5.39	Supply & Install Armgold (ID G11) 100mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output)	No	1		R	-

5.40	Supply & Install Armgold (ID G11) DN 100mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.41	Supply & Install Armgold (ID G11) DN 100 VJ Coupling, Bolts and nuts complete.	No	3		R	-
5.42	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.43	Supply & Install Armgold (ID G11) cast concrete slab (2000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	4		R	-
5.44	Supply & Install Freegold/Harmony (ID G12) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.45	Supply and Install Freegold/Harmony (ID G12) DN 250mm to 200mm Concentric Flanged Reducer.	No	1			
5.46	Supply & Install Freegold/Harmony (ID G12) DN 250mm VJ Coupling, Bolts and nuts complete.	No	1			
5.47	Supply & Install Freegold/Harmony (ID G12) DN 250mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.48	Supply & Install Freegold/Harmony (ID G12) DN 250mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
5.49	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT)	No	1		R	-
5.5	Supply & Install Freegold/Harmony (ID G12) cast concrete slab (4000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	8		R	-
5.51	Supply & Install Freegold/Harmony (ID G12) cast concrete Valve chamber with cover slab (4000mmx4000mmx3000mm) fitted with lifting hooks	m^3	48		R	-
5.52	Supply & Install Freegold/Harmony (ID G12) DN 250mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	1		R	-
5.53	Supply & Install Freegold/Harmony (ID G12) DN 250mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
5.54	Supply & Install Freegold/Harmony (ID G12) cast concrete lid (600mm dia) fitted with lifting hooks	No	1		R	-
5.55	Supply & Install Freegold/Harmony (ID G13) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.56	Supply & Install Freegold/Harmony (ID G13) DN 200mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	1		R	-
5.57	Supply & Install Freegold/Harmony (ID G13) DN 200mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
5.58	Supply & Install Freegold/Harmony (ID G13) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	1		R	-
5.59	Supply & Install Freegold/Harmony (ID G13) DN 300mm 200mm VJ Coupling, Bolts and nuts	No	1		R	-
5.60	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.61	Supply & Install Freegold/Harmony (ID G13) cast concrete slab (2200mmx4600mm) fitted with lifting hooks and Smartlock Lid.	m^2	10		R	-
5.62	Supply & Install Freegold/Harmony St Helena (ID G14) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.63	Supply & Install Freegold/Harmony St Helena (ID G14) DN 200mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.64	Supply & Install Freegold/Harmony St Helena (ID G14) DN 200mm VJ Coupling, Bolts and nuts	No	3			
5.65	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.66	Supply & Install Freegold/Harmony St Helena (ID G14) cast concrete slab (5000mmx2700mm) fitted with lifting hooks and Smartlock Lid.	m^2	14		R	-
5.67	Supply & Install Freegold/Harmony St Helena (ID G14) cast concrete lid (1000mmx1000mm) fitted with lifting hooks.	m^2	1		R	-
5.68	Supply & Install Freegold/Harmony St Helena (ID G14) cast concrete lid (600mm dia) fitted with lifting hooks.	m^2	0			
5.69	Supply & Install Freegold/Harmony Matjhabeng (ID G17) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.70	Supply & Install Freegold/Harmony Matjhabeng (ID G17) DN 200mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.71	Supply & Install Freegold/Harmony Matjhabeng (ID G17) DN 200 VJ Coupling, Bolts and nuts complete.	No	3		R	-
5.72	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.73	Supply & Install Freegold/Harmony Matjhabeng (ID G17) cast concrete slab (4350mmx2200mm) fitted with lifting hooks and Smartlock Lid.	m^2	10		R	-
5.74	Supply & Install Freegold/Harmony Matjhabeng (ID G17) cast concrete lid (800mm x 800mm) fitted with lifting hooks.	m^2	1		R	-

5.75	Supply & Install Mizens Packaging (ID G19) DN 80mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.76	Supply and Install Mizens Packaging (ID G19) DN 450mm to 80mm Concentric Flanged Reducer.	No	1		R	-
5.77	Supply & Install Mizens Packaging (ID G19) DN 80mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
5.78	Supply & Install Mizens Packaging (ID G19) DN 450mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	1		R	-
5.79	Supply & Install Mizens Packaging (ID G19) DN 450mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
5.80	Supply & Install Mizens Packaging (ID G19) DN 200mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.81	Supply & Install Mizens Packaging (ID G19) DN 200mm VJ Coupling, Bolts and nuts complete.	No	4		R	-
5.82	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.83	Supply & Install Mizens Packaging (ID G19) cast concrete slab (2240mm x4560mm) fitted with lifting hooks and Smartlock Lid.	m^2	10		R	-
5.84	Supply & Install Mizens Packaging (ID G19) cast concrete lid (840mm x840mm) fitted with lifting hooks.	m^2	1		R	-
5.85	Supply & Install Mizens Packaging (ID G19) cast concrete lid (6000mm Dia) fitted with lifting hooks.	m^2	28		R	-
5.86	Supply & Install Mizens Packaging (ID G19) cast concrete lid (690mm x690mm) fitted with lifting hooks.	m^2	1		R	-
5.87	Supply & Install Mizens Packaging (ID G19) cast concrete lid (650mm x540mm) fitted with lifting hooks.	m^2	1		R	-
5.88	Supply & Install Freegold/Harmony Matjhabeng (ID G20) DN 100mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.89	Supply & Install Freegold/Harmony Matjhabeng (ID G20) DN 100mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
5.90	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.91	Supply & Install Freegold/Harmony Matjhabeng (ID G20) cast concrete slab (2800mm dia) fitted with lifting hooks and Smartlock Lid.	m^2	6		R	-
5.92	Supply & Install Freegold/Harmony Pamodzi (ID G21) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.93	Supply and Install Freegold/Harmony Pamodzi (ID G21) DN 450mm to 200mm Concentric Flanged Reducer.	No	1		R	-
5.94	Supply & Install Freegold/Harmony Pamodzi (ID G21) DN 200mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
5.95	Supply & Install Freegold/Harmony Pamodzi (ID G21) DN 450mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.96	Supply & Install Freegold/Harmony Pamodzi (ID G21) DN 450mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
5.97	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.98	Supply & Install Freegold/Harmony Pamodzi (ID G21) cast concrete slab (4600mm X2200mm) fitted with lifting hooks and Smartlock Lid.	m^2	10		R	-
5.99	Supply & Install Freegold/Harmony Pamodzi (ID G21) cast concrete lid (700mm X100mm) fitted with lifting hooks.	m^2	1		R	-
5.100	Supply & Install Freegold/Harmony Matjhabeng (ID G22) DN 150mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.101	Supply & Install Freegold/Harmony Matjhabeng (ID G22) DN 150mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	1		R	-
5.102	Supply & Install Freegold/Harmony Matjhabeng (ID G22) DN 150mm VJ Coupling, Bolts and nuts complete.	No	2		R	-
5.103	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.104	Supply & Install Freegold/Harmony Matjhabeng (ID G22) cast concrete slab (2000mm X1700mm) fitted with lifting hooks and Smartlock Lid.	m^2	3		R	-
5.105	Supply & Install Freegold/Harmony Matjhabeng (ID G22) manhole ring to Raise the 2000mm diaeter Manhole.	m^2	3		R	-
5.106	Supply & Install Freegold/Harmony Matjhabeng (ID G22) cast concrete to Raise the 4000mmx4000mm Rectangular chamber.	m^2	16		R	-
5.107	Supply & Install Freegold/Harmony Matjhabeng (ID G22) cast concrete lid (600mm dia) fitted with lifting hooks.	m^2	0		R	-
5.108	Supply & Install Freegold/Harmony Tshepong (ID G55) DN 150mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-

5.109	Supply & Install Freegold/Harmony Tshepong (ID G55) DN 150mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.110	Supply & Install Freegold/Harmony Tshepong (ID G55) DN 150mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
5.111	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.112	Supply & Install Freegold/Harmony Tshepong (ID G55) cast concrete slab (1850mm dia) fitted with lifting hooks and Smartlock Lid.	m^2	3		R	-
5.113	Supply & Install Freegold/Harmony Tshepong (ID G55) 2400mm diaeter manhole rings	No	4		R	-
5.114	Supply & Install Freegold/Harmony Tshepong (ID G55) cast concrete lid (600mm dia) fitted with lifting hooks.	m^2	1		R	-
5.115	Supply & Install Freegold Harmony Target (ID I03) DN 150mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output)	No	1		R	-
5.116	Supply and Install Freegold Harmony (ID I03) DN 300mm to 150mm Concentric Flanged Reducer.	No	1			
5.117	Supply & Install Freegold Harmony Target (ID I03) DN 300mm VJ Coupling, Bolts and nuts complete.	No	1			
5.118	Supply & Install Freegold Harmony Target (ID I03) DN 300mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.119	Supply & Install Freegold Harmony Target (ID I03) DN 300mm VJ Coupling, Bolts and nuts	No	1			
5.120	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.121	Supply & Install Freegold/Harmony Target (ID I03) cast concrete slab (4000mmx2500mm) with lifting hooks and Smartlock Lid.	m^2	10		R	-
5.122	Supply & Install Freegold Harmony Target (ID I04) DN 100mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.123	Supply & Install Freegold Harmony Target (ID I04) DN 100mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.124	Supply & Install Freegold/Harmony Target (ID I04) DN 100mm VJ Coupling, Bolts and nuts	No	3			
5.125	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.126	Supply & Install Freegold/Harmony Target (ID I04) cast concrete slab (2500mmx1500mm) with lifting hooks and Smartlock Lid.	m^2	4		R	-
5.127	Supply & Install Freegold Harmony Target (ID I05) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.128	Supply & Install Freegold Harmony Target (ID I05) DN 200mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.129	Supply & Install Freegold Harmony Target (ID I05) DN 200mm VJ Coupling, Bolts and nuts	No	3		R	-
5.130	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.131	Supply & Install Freegold/Harmony Target (ID I05) cast concrete slab (3000mmx2000mm) with lifting hooks and Smartlock Lid.	m^2	6		R	-
5.132	Supply & Install Avgold Target (ID I14) DN 100mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.133	Supply and Install Avgold Target (ID I14) DN 200mm to 100mm Concentric Flanged Reducer.	No	1			
5.134	Supply & Install Acgold Target (ID I14) DN 100mm VJ Coupling, Bolts and nuts complete.	No	1			
5.135	Supply & Install Avgold Target (ID I14) DN 200mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.136	Supply & Install Acgold Target (ID I14) DN 200mm VJ Coupling, Bolts and nuts complete.	No	1			
5.137	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.138	Supply & Install Acgold Target (ID I14) cast concrete slab (2000mmx2000mm) with lifting hooks and Smartlock Lid.	m^2	4		R	-
5.139	Supply & Install Acgold Target (ID I14) Cast concrete lid (600mm) fitted with lifting hooks.	m^2	1		R	-
5.140	Supply & Install Freegold/Harmony Tshepong (ID J17) DN 250mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.141	Supply & Install Freegold/Harmony Tshepong (ID J17) DN 250mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.142	Supply & Install Freegold/Harmony Tshepong (ID J17) DN 250mm VJ Coupling, Bolts and nuts	No	3		R	-

5.143	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.144	Supply & Install Freegold/Harmony Tshepong (ID J17) cast concrete slab (2500mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	5		R	-
5.145	Supply & Install Freegold/Harmony (ID K04) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output)	No	1		R	-
5.146	Supply & Install Freegold/Harmony (ID K04) DN 200mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.147	Supply and Install Phomolong (ID K04) DN 200mm VJ Coupling, Bolts and nuts complete.	No	3		R	-
5.148	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.149	Supply and Install Phomolong (ID K04) cast concrete slab (2000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	4		R	-
5.150	Supply & Install Sebanye Gold Beatrix (ID L01) 300mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output)	No	1		R	-
5.151	Supply & Install Sebanye Gold Beatrix (ID L01) DN 300mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.152	Supply and Install Sebanye Gold Beatrix (ID L01) DN 300mm VJ Coupling, Bolts and nuts	No	3		R	-
5.153	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.154	Supply and Install Sebanye Gold Beatrix (ID L01) cast concrete slab (2000mmx2000mm) fitted with lifting hooks and Smartlock Lid.	m^2	4		R	-
5.155	Supply & Install Freegold/Harmony Joel (ID L08) 150mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output)	No	1		R	-
5.156	Supply & Install Freegold/Harmony Joel (ID L08) DN 150mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.157	Supply & Install Freegold/Harmony Joel (ID L08) VJ Coupling, Bolts and nuts complete.	No	3			
5.158	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.159	Supply & Install Freegold/Harmony Joel (ID L08) concrete slab (3000mmx3000mm) fitted with lifting hooks and Smartlock Lid.	m^2	9		R	-
5.160	Supply & Install Escom (ID L13) DN 25mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.161	Supply and Install Escom (ID L13) DN 80mm to 25mm Concentric Flanged Reducer.	No	1			
5.162	Supply & Install Escom (ID L13) DN 80mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.163	Supply & Install Escom (ID L13) DN 80mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
5.164	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.165	Supply & install Escom (ID L13) concrete Slab (1300m dia) fitted with lifting hooks and Smartlock Lid.	m^2	1		R	-
5.166	Supply & Install Sebanye Gold Beatrix Sewage (ID L14) 50mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.167	Supply & Install Sebanye Gold Beatrix Sewage (ID L14) DN 50mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.168	Supply & Install Sebanye Gold Beatrix Sewage (ID L14) DN 50mm VJ Coupling	No	3		R	-
5.169	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.170	Supply & install Sebanye Gold Beatrix Sewage (ID L14) concrete Slab (2000mm diaeter) fitted with lifting hooks and Smartlock Lid.	m^2	3		R	-
5.171	Supply & Install ID Tetra 4 (ID L16) DN 150mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.172	Supply & Install Tetra 4 (ID L16) DN 150mm Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.173	Supply & Install Tetra 4 (ID L16) DN 150mm VJ Coupling, Bolts and nuts complete.	No	3		R	-

5.174	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.175	Supply & Install Tetra 4 (ID L16) cast concrete slab (2000mmx2000mm) with lifting hooks and Smartlock Lid.	m^2	4		R	-
5.176	Supply & Install ID Sebanye Gold Oryx (ID L17) DN 200mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.177	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.178	Supply & Install Sebanye Gold Oryx (ID L17) cast concrete slab (2000mm dia) with lifting hooks and Smartlock Lid.	m^2	3		R	-
5.179	Supply & Install Sebanye Gold Beatrix (ID L22) DN 50mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.180	Supply & Install Sebanye Gold Beatrix (ID L22) DN 50mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.181	Supply & Install Sebanye Gold Beatrix (ID L22) VJ Coupling, Bolts and nuts complete.	No	3			
5.182	Supply & Install Sebanye Gold Oryx (ID L22) cast concrete slab (2000mm dia) with lifting hooks and Smartlock Lid.	m^2	3			
5.183	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.184	Supply & Install Sebanye Gold Beatrix (ID L22) cast concrete slab (2000mm dia) with lifting hooks and Smartlock Lid.	m^2	3		R	-
5.185	Supply & Install ID Sebanye Gold Beatrix (ID L24) DN 50mm Smart Magflo Meter Isomag WaMSS Scada Web Based with built in transmission (Battery Powered with mA & Pulse output).	No	1		R	-
5.186	Supply and Install Sebanye Gold Beatrix (ID L24) DN 300mm to 50mm Concentric Flanged Reducer.	No	1		R	-
5.187	Supply and Install Phomolong (ID L24) DN 50mm VJ Coupling, Bolts and nuts complete.	No	1		R	-
5.188	Supply & Install Sebanye Gold Beatrix (ID L24) DN 300mm PN16 Flanged Gate Valve and spool pipe (TBC on Site).	No	2		R	-
5.189	Supply and Install Phomolong (ID L24) VJ Coupling, Bolts and nuts complete.	No	2		R	-
5.190	Supply and install Smart Lock Lid similar to Smart MS Solutions RHI-Node MD700 Lid & Frame Glam assembly in concrete Slab below complete with Smart Sense device (NBIOT) and Water level sensor (IOT).	No	1		R	-
5.191	Supply & Install Sebanye Gold Beatrix (ID L24) cast concrete slab (2000mm dia) with lifting hooks and Smartlock Lid.	m^2	3		R	-
	Total				**R**	**-**
	GENERAL					
6	Supply & Install WaMMS Scada System Web Based complete.	Sum	1		R	-
6.1	Smart Meter Data Licence for 3 years.	No	3		R	-
6.2	Smart Lock Data Licence for 3 years if needed	No	3		R	-
6.3	Smartlock Bluetooth LE Smart Key (Long) with carry case kit.	No	20		R	-
6.4	Smartlock Mechanical Key Screw thread (GEN).	No	20		R	-
6.5	Program Adroit Scada to include all Smart Meter & Smartlock data from monitoring platforms.	Sum	2		R	-
6.6	Commissioning of Smart Meters and Smart Lock systems	Sum	1		R	-
	Total				**R**	**-**
	SUB TOTAL 1				R	-
	10 % CONTINGENCIES				R	-
	SUB TOTAL 2				R	-
	15% VAT				R	-
	TOTAL				**R**	**-**

SUMMARY:	SMART WATER BILLING METERS, SMART CHAMBERS AND VALVES (VC-BWTW-B1 D)		
SECTION	**DESCRIPTION**	**AMOUNT**	
1	**Site description:** VCW's installation of smart water billing meters, smart chambers and valves (VC-BWTW-B1 D)	R	-
2	WATER METERS - MATJHABENG	R	-
3	WATER METERS - NALA	R	-
4	WATER METERS - VCW BALKFONTEIN & VIRGINIA	R	-
5	WATER METERS - MINES	R	-
6	GENERAL	R	-
7	OCCUPATIONAL HEALTH AND SAFETY	R	-
	SUBTOTAL	**R**	**-**
	10% CONTINGENCIES	R	-
	SUBTOTAL	**R**	**-**
	15% VAT	R	-
	TOTAL	**R**	**-**

water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

HEALTH AND SAFETY SUMMARY

SECTION	DESCRIPTION	AMOUNT
1	Occupational Health and Safety Management	R -
2	Competency, Training and Compliance	R -
3	Medical Examination	R -
4	Incident Management	R -
5	Security Measures	R -
6	Traffic Management	R -
7	Personal Protective Equipment (PPE)	R -
8	Construction Signs	R -
9	Emergency Evacuation Measures	R -
10	Stacking, Storage and Housekeeping	R -
11	Temporary Electrical Installations	R -
12	Safe Excavation	R -
13	Lifting Tackle (Cranes)	R -
14	Construction Site Facilities	R -
15	Hazardour Chemical Substance (HCS)	R -
16	Waste Management	R -
17	Confined Space	R -
18	Dangerous Species	R -
19	Working with sewer/effluent	R -
20	Asbestos Abatement Management	R -
	SUBTOTAL	
	10% CONTINGENCIES	
	SUBTOTAL	
	15% VAT	
	TOTAL	

BOQ: OHS BUDGET BREAKDOWN FOR CONTRACTORS

ITEM NO.	SHORT DESCRIPTION	UNIT	QUANTITY	RATE	Total
	Contract Details				
	Site description:				
	REQUEST FOR BIDS FOR THE INSTALLATION OF SMART BILLING WATER METERS AND SMART CHAMBERS IN NORTHERN FREE STATE				
1	**SECTION 1: OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT**				
1.1	SACPCMP Registered Health and Safety Manager/Safety Officer	Month	12		R -
1.2	Site establishment	Sum	1		R -
1.3	Health and Safety Management System (Health & Safety File)	Sum	1		R -
1.4	Laptop	Sum	1		R -
1.5	Printer	Sum	1		R -
1.6	Office	Month	12		R -
1.7	Laminator	Month	12		R -
1.8	SMI Board	Month	12		R -
1.9	Laminating pouches	Month	12		R -
1.10	Printing Paper	Month	12		R -
1.11	Printing Cath ridges	Month	12		R -
1.12	Dividers	Month	12		R -
1.13	Files	Sum	12		R -
1.14	Document Control: Approved Stamp and Superseded Stamp	Sum	1		R -
		Total			**R -**
2	**SECTION 2: COMPETENCIES, TRAINING AND COMPLIANCE**				
2.1	Safety for Supervisors Training	Sum	1		R -
2.2	Legal Liability Training	Sum	1		R -
2.3	Hazard identification and Risk Assessment (HIRA) Training	Sum	1		R -
2.4	Incident Investigation Training: Level 3	Sum	1		R -
2.5	First Aid Level 1 & 2	Sum	1		R -
2.6	Firefighting Training	Sum	1		R -
2.7	Emergency Co-ordinator Training	Sum	1		R -
2.8	Safety Representative training	Sum	1		R -
2.9	Basic Working at Heights Training	Sum	1		R -
2.10	Scaffold Erector	Sum	1		R -
2.11	Scaffold Inspector Training	Sum	1		R -
2.12	Scaffold Supervisor Training	Sum	1		R -
2.13	Excavation supervisor training	Sum	1		R -
2.14	Fall Protection Plan Developer Training	Sum	1		R -
2.15	Confined Space Training	Sum	1		R -
2.16	Use of Electrical Tools and Portable Electrical Equipment.	Sum	1		R -
2.17	Snake Handling Training	Sum	1		R -
2.18	Crane Operator	Sum	1		R -
2.19	Rigging Training	Sum	1		R -
2.20	Stacking and Storage training	Sum	1		R -
2.21	Construction Vehicles and Mobile Plant Training	Sum	1		R -
		Total			**R -**
3	**SECTION 3: MEDICAL EXAMINATION**				
3.1	Pre employment	Sum	1		R -
3.2	Annual Medical	Sum	1		R -
3.3	Exit Medical	Sum	1		R -
		Total			**R -**

4	**SECTION 4: INCIDENT MANAGEMENT**					
4.1	First Aid Box	Sum	3		R	-
4.2	Refill kits	Month	3		R	-
4.3	Spine Board	Sum	4		R	-
4.4	Immobilisation Package	Sum	1		R	-
4.5	Emergency Chair/Bed	Sum	1		R	-
		Total			**R**	**-**
5	**SECTION 5: SECURITY MEASURES**					
5.1	Access cards for employees, visitors	Month	20		R	-
5.2	Office cubicle for security	Sum	1		R	-
5.3	Office furniture	Sum	3		R	-
5.4	Locker	Sum	1		R	-
5.5	Stationary	Sum	10		R	-
5.6	Visitor register	Sum	5		R	-
5.7	Breathelizers	Sum	2		R	-
5.8	Training	Sum	2		R	-
		Total			**R**	**-**
6	**SECTION 6: TRAFFIC MANAGEMENT**					
6.1	Training	Sum	1		R	-
6.2	Traffic Equipment	Sum	10		R	-
6.3	Traffic Control Signage and delineators	Sum	10		R	-
6.4	Traffic Accomodation	Month	2		R	-
		Total			**R**	**-**
7	**SECTION 7: PERSONAL PROTECTIVE EQUIPMENT (PPE)**					
7.1	Overall, with company logo and reflectors	Sum	20		R	-
7.2	Employees not wearing overalls – reflector vests	Sum	20		R	-
7.3	Safety shoes	Sum	20		R	-
7.4	Hard hat	Sum	20		R	-
7.5	Ear protection	Sum	20		R	-
7.6	Safety goggles	Sum	20		R	-
7.7	Dust Masks	Sum	20		R	-
7.8	Gloves	Sum	20		R	-
7.9	Respirators	Sum	20		R	-
7.10	Sun Hats	Sum	20		R	-
7.11	Gumboots	Sum	20		R	-
	Additional Items:				R	-
		Total			**R**	**-**
8	**SECTION 8: CONSTRUCTION SIGNS**					
8.1	Warning signs	Sum	4		R	-
8.2	Information signs	Sum	4		R	-
8.3	prohibition signs	Sum	4		R	-
8.4	Mandatory signs	Sum	4		R	-
	Additional Items:					
		Total			**R**	**-**
9	**SECTION 9: EMERGENCY EVACUATION MEASURES**					
9.1	Emergency Evacuation Alarms	Sum	4		R	-
9.2	Emergency Signs	Sum	4		R	-
9.3	Fire Extinguishers	Sum	6		R	-
9.4	Emergency Equipment	Sum	6		R	-
		Total			**R**	**-**
10	**SECTION 10: STACKING, STORAGE & HOUSEKEEPING**					
10.1	Orange safety netting	Month	10		R	-
10.2	Warning signs	Month	20		R	-
10.3	Information signs	Month	20		R	-
10.4	Prohibition signs	Month	20		R	-
10.5	Mandatory signs	Month	20		R	-
10.6	Colour Coded dust bins	Month	4		R	-
10.7	Other					
		Total			**R**	**-**

11	**SECTION 11: TEMPORARY ELECTRICAL INSTALLATIONS**					
11.1	Temporary electrical installation controller.	Sum	1		R	-
11.2	Monthly earth leakage tests	Month	12		R	-
11.3	COC	Sum	1		R	-
11.4	Other				R	-
		Total			**R**	**-**
12	**SECTION 12: SAFE EXCAVATIONS**					
12.1	Ladders forSafe access	Sum	4		R	-
12.2	Orange safety netting	Month	10		R	-
12.3	Signage	Month	20		R	-
12.4	Step, batter, or shore of excavations	Month	12		R	-
12.5	Material to shore and brace excavations	Month	15		R	-
12.6	Appointment of temporary works designer	Sum	4		R	-
12.7	Temporary works design	Sum	4		R	-
12.8	Training to erect and install temporary works according to designs.	Sum	4		R	-
12.9	Provision for temporary works designer to inspect temporary designs.	Sum	4		R	-
		Total			**R**	**-**
13	**SECTION 13: LIFTING TACKLE (CRANE)**					
13.1	Load test / hook test	Sum	4		R	-
13.2	Rigging ropes/slings inspections	Sum	4		R	-
13.3	Radios for communication	Sum	4		R	-
13.4	Rigging ropes/slings	Sum	4		R	-
13.5	Crane operators	Month	2		R	-
13.6	Riggers	Month	2		R	-
13.7	Nylon & polyester web slings	Sum	4		R	-
		Total			**R**	**-**
14	**SECTION 14: CONSTRUCTION SITE FACILITIES**					
14.1	Toilets	Sum	4		R	-
14.2	Maintenance of toilets	Month	12		R	-
14.3	Changing facilities for each sex	Sum	12		R	-
14.4	Sheltered eating areas	Sum	12		R	-
14.5	Sufficient cleaning implements (brooms etc.)	Month	12		R	-
14.6	Waste bins	Sum	12		R	-
14.7	Soap	Month	12		R	-
14.8	Toilet paper	Month	12		R	-
14.9	Lockers	Sum	12		R	-
		Total			**R**	**-**
15	**SECTION 15: HAZARDOUS CHEMICAL SUBSTANCE (HCS)**					
15.1	HCS / Flammable Liquid Storage	Sum	1		R	-
15.2	HCS Controller Training	Sum	1		R	-
15.3	Fire Fighting Equipment	Sum	8		R	-
15.4	Spillage Kits	Sum	4		R	-
	Dip Trays	Sum	4		R	-
		Total			**R**	**-**
16	**SECTION 16: WASTE MANAGEMENT**					
16.1	Colour Coded dust bins	Sum	4		R	-
16.2	Refuse removal service provider	Month	4		R	-
		Total			**R**	**-**
17	**SECTION 17: CONFINED SPACE**					
17.1	Air monitor to be used should be able to detect all gasses likely to be present inside the confined space.	Sum	1		R	-
17.2	Calibration of air monitor	Sum	2		R	-
17.3	Training: use of air monitor	Sum	2		R	-
17.4	Emergency equipment	Sum	2		R	-
17.5	Extractor fans	Sum	2		R	-
17.6	Force fans	Sum	2		R	-
17.7	Safety Harnesses	Sum	4		R	-
17.8	Trypot and pully	Sum	2		R	-
17.9	Lifelines	Sum	2		R	-
	Other				R	-
		Total			**R**	**-**

18	**SECTION 18: DANGEROUS SPECIES**					
18.1	Snake handling training	Sum	2		R	-
18.2	Snake handling equipment	Sum	4		R	-
18.3	Snake Repellant	Sum	4		R	-
18.4	Anti Vernom	Sum	5		R	-
		Total			**R**	**-**
19	**SECTION 19: WORKING WITH SEWER/EFFLUENT**					
19.1	Hepatitis A & B injections.	Sum	1		R	-
		Total			**R**	**-**
20	**SECTION 20: ASBESTOS ABATEMENT MANAGEMENT**					
20.1	AIA to be appointed (survey to be conducted)	Sum	1		R	-
20.2	Air monitoring	Sum	1		R	-
20.3	Asbestos training	Sum	1		R	-
20.4	Special PPE	Sum	2		R	-
20.5	Asbestos Contractor	Sum	1		R	-
20.6	Removing, stacking, and storing of asbestos material	Sum	1		R	-
20.7	Transport and disposal of asbestos material	Sum	1		R	-
		Total			**R**	**-**
21	**SECTION 21: OTHER**					
		Total				
	SUB Total				**R**	**-**
	10 % CONTINGENCIES				R	-
	SUB Total				R	-
	15% VAT				R	-
	Total				R	-