SEKHUKHUNE
District Municipality
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CONTRACT NUMBER: SK8/3/1-22/2024/25

TENDER DOCUMENT

(PROVISION OF CONTRACTUAL SERVICES)

FOR

CONSTRUCTION OF MOUTSE EAST AND WEST WATER RETICULATION PHASE 2: ELOKHISHINI, PHOOKO AND PHOOKWANE -CONTRACT 2D

CIDB GRADING: 7 CE

CLOSING DATE: 10 December 2024

Client:	**Prepared By:**
SEKHUKUNE DISTRICT MUNICIPALITY 3 West Street GROBLERSDAL 0470 **Tel:** 013 262 7300 **e-mail**: sekinfo@sekhukhune.co.za **Enquires:** Mr. Voster Masemola (Supply Chain Management)	**RENDEALS FOUR CONSULTING** Plot 46 Tweefontein POLOKWANE 0700 **Tel:** 015 297 1300 **e-mail**: info@rendeals4.co.za **Enquires:** Mr. Rofhiwa Khorommbi

NAME OF TENDERER	:	
CSD REGISTRATION NUMBER	:	
CIDB REGISTRATION NUMBER	:	
TENDERED AMOUNT	:	
mig | Municipal Infrastructure Grant		EXPANDED PUBLIC WORKS PROGRAMME Creating opportunities towards human fulfilment

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PART T1 TENDERING PROCEDURES

TENDER NO: SK8/3/1-22/2024/25 **CIDB Category 7 CE or Higher**

FOR

CONSTRUCTION OF MOUTSE EAST AND WEST WATER RETICULATION PHASE 2: ELOKHISHINI, PHOOKO AND PHOOKWANE -CONTRACT 2D

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T1.1 Tender Notice and Invitation to Tender

SUPPLY CHAIN MANAGEMENT

INVITATION TO BID **MBD1**

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE SEKHUKHUNE DISTRICT MUNICIPALITY					
BID NUMBER:	SK8/3/1-22/2024/25	CLOSING DATE:	10/12/2024	CLOSING TIME:	11h00
DESCRIPTION	CONSTRUCTION OF MOUTSE EAST AND WEST WATER RETICULATION PHASE 2: ELOKHISHINI, PHOOKO AND PHOOKWANE CONTRACT 2D				
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT					
Groblersdal Fire Station, R33 Groblersdal 0470					
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO			**TECHNICAL ENQUIRIES MAY BE DIRECTED TO:**		
CONTACT PERSON	Mr. Voster Masemola		CONTACT PERSON	Mr. Floyd Mashele	
TELEPHONE NUMBER	013 262 7300		TELEPHONE NUMBER	013 262 7535	
FACSIMILE NUMBER			FACSIMILE NUMBER		
E-MAIL ADDRESS	masemolav@sekhukhune.gov.za		E-MAIL ADDRESS	mashelef@sekhukhune.gov.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					
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		**OR**	CENTRAL SUPPLIER DATABASE No:	
1. ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐Yes ☐No [IF YES ENCLOSE PROOF]		**2.** ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES /WORKS OFFERED?**	☐Yes ☐No [IF YES, ANSWER THE QUESTIONNAIRE BELOW]	

QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS	
IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	☐ YES ☐ NO
DOES THE ENTITY HAVE A BRANCH IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?	☐ YES ☐ NO
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?	☐ YES ☐ NO
IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 BELOW.	

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 IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.**

1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT Third Edition 2015 (GCC 2015) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.

1.4. **THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD7).**

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 VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.

2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.

2.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.

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

2.6 WHERE NO TCS PIN IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

2.7 NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE."

NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER:

…….

CAPACITY UNDER WHICH THIS BID IS SIGNED:

…….

(Proof of authority must be submitted e.g. company resolution)

DATE:

……..

Bid documents are obtainable from the Supply Chain Management Office, Bareki Mall at a non-refundable tender deposit of R1,000.00 or bidders could also download the document for free on National Treasurey e-tender. A compulsory briefing session will be held at AB Sikhosana Fire Station in Groblersdal on the 12th of November 2024 at 11h00 am. Bids must be completed in accordance with the conditions attached to the Bid documents and must be sealed and endorsed: Contract (Specify Bid Number: SK8/3/1-22/2024/25). Bids will be submitted to supply chain offices.

Address

Location of tender box: .....AB Sikhosana Fire Station
Physical address: R33 .....Groblerdal `

The Council reserves the right to accept or reject any Bid or part thereof:

Municipal Manager: Mr. MM Kgwale
LIMPOPO PROVINCE
Corner van Riebeeck and Chris Wiid street
Groblersdal
0470

_____
Supply Chain Manager
Mr. V Masemola

_____
Chief Financial Officer
Mr. H Nkadimeng

T1.2 Tender Data

Tender No: SK8/3/1-22/2024/25

Tender Data

The conditions of tender are the Standard Conditions of Tender as contained in SANS 10845-3: 2015 Edition 1 which are reproduced without amendment or alteration for the convenience of tenderers after this Tender Data.

The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of tender. Each item of data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.

The Additional Conditions of Tender are:

Clause number	Tender Data
F.1.1	The employer is the Sekhukhune District Municipality in LIMPOPO PROVINCE.
F.1.2	The tender documents issued by the employer comprise: T1.1 Tender notice and invitation to tender T1.2 Tender data T2.1 List of returnable documents T2.2 Returnable schedules **Part 1: Agreements and contract data** C1.1 Form of offer and acceptance C1.2 Contract data C1.3 Form of Guarantee C1.4 Safety Agreement **Part 2: Pricing data** C2.1 Pricing instructions C2.2 Activity schedules / Bills of Quantities **Part 3: Scope of work** C3 Scope of work **Part 4: Site information** C4 Site information
	The Employer's Agent is:
	Each communication between the employer and a Bidder 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 Bidder. The name and contact details of the employer's agent are stated in the tender data
F.1.5.1	Sekhukhune District Municipality 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) Such decision to cancel this tender will be published in the CIDB website and in the government Tender Bulletin for the media in which the original tender invitation was advertised.
F.2.1	Only those Bidders who have in their employ management and supervisory staff satisfying the requirements of the Scope of Work for labour intensive competencies for supervisory and management staff are eligible to submit tenders.
F.2.2	Only those Bidders who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations for 7 CE or Higher Class of construction work, are eligible to submit tenders. Joint ventures are eligible to submit tenders provided that:

	1. every member of the joint venture is registered with the CIDB; 2. The lead partner has a contractor grading designation in the 7 CE or 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 Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a 7 CE or Higher class of construction work. Only those respondents who are registered with the Construction Industry Development Board, or are capable of being so registered within twenty-one (21) working days from the closing date for submission of tenders, in a contractor grading designation of 7 CE or higher, are eligible to have their submissions evaluated. Joint ventures are eligible to have their submissions evaluated provided that: every member of the joint venture is registered with the cidb not later than twenty-one (21) working days from the closing date for tenders; the lead partner has a contractor grading designation in the 7 CE class of construction work; or not lower than one level below the required grading designation in the class of works construction works under considerations and possess the required recognition status. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than the required contractor grading designation.
F2.2.1	The employer will not compensate the Bidder 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.
F.2.7	A **COMPULSORY CLARIFICATION MEETING** will take place at AB Sikhosana Fire Station Physical address: R33 Grobersdal for clarification by responsible officials assigned to the contract on 12th of November 2024 at 11:00
F.2.7	The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender. Bidders must sign the attendance register in the name of the tendering entity. Addenda will be issued to and tenders will be received only from those tendering entities appearing on the attendance list.
F.2.8	Request clarification of the tender documents, if necessary, by notifying the Employer's Agent at least five working days before the closing time stated in the tender data.
F.2.11	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 Bidder. All signatories to the tender offer shall initial all such alterations.

SDM:	Witness 1:	Witness 2:	Tenderer:	Witness 1:	Witness 2:

F.2.12	*No alterative tender offers will be considered If Bidder wishes to submit an alternative tender offer, the only criteria permitted for such alternative tender offer is that it demonstrably satisfies the Employer's standards and requirements, the details of which may be obtained from the Employer's Agent. Calculations, drawings and all other pertinent technical information and characteristics as well as modified or proposed Pricing Data must be submitted with the alternative tender offer to enable the Employer to evaluate the efficacy of the alternative and its principal elements, to take a view on the degree to which the alternative complies with the Employer's standards and requirements and to evaluate the acceptability of the pricing proposals. Calculations must be set out in a clear and logical sequence and must clearly reflect all design assumptions. Pricing Data must reflect all assumptions in the development of the pricing proposal. Acceptance of an alternative tender offer will mean acceptance in principle of the offer. It will be an obligation of the contract for the Bidder, in the event that the alternative is accepted, to accept full responsibility and liability that the alternative offer complies in all respects with the Employer's standards and requirements. The modified Pricing Data must include an amount equal to 5% of the amount tendered for the alternative offer to cover the Employer's costs of confirming the acceptability of the detailed design before it is constructed.
F.2.13.3	Parts of each tender offer communicated on paper shall be submitted as original and no copies will be necessary.
F.2.13.5	The employer's address for delivery of tender offers and identification details to be shown on each tender offer package are: **Location of tender box:** AB Sikhosana Fire Station **Physical address:** R33 Groblerdal **Identification details:** *Contract number, title of tender and the closing date and time of the tender* **Postal address:** Sekhukhune District Municipality, Riebeeck and Chris Wiid Street Groblersdal 0470
F.2.13.6	A two-envelope procedure will not be followed.
F.2.14	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.
F.2.15	The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.
F.2.15	Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.
F.2.16	The tender offer validity period is *90 days*
F.2.18	The Bidder shall, when requested by the Employer to do so, submit the names of all management and supervisory staff that will be employed to supervise the labour-intensive portion of the works together with satisfactory evidence that such staff members satisfy the eligibility requirements.
F.2.23	The Bidder is required to submit with his tender a Certificate of Contractor Registration issued by the Construction Industry Development Board and a **valid** Tax Clearance Certificate/ CSD PIN issued by the South African Revenue Services. Where a Bidder satisfies CIDB contractor grading designation requirements through joint venture formation, such Bidders must submit the Certificates of Contractor Registration in respect of each partner.
F.3.4	Tenders will be opened immediately after the closing time of tenders at Sekhukhune District Municipality
F.3.11	The procedure for the evaluation of responsive tenders is Method 1.

	The financial offer will be scored using Formula 2 (option 1) where the value of W_1 is: 1) 90 where the financial value inclusive of VAT of all responsive tenders received have a value in excess of R 50 000 000; or 2) 80 where the financial value inclusive of VAT of one or more responsive tender offers equals or is less than R 50 000 000. Up to 100 minus W_1 tender evaluation points will be awarded to Bidders who complete the referencing schedule and who are found to be eligible for the preference claimed.
F.3.11	**Evaluation of Tenders** The Bidders notice is drawn to the fact that the evaluation, adjudication and awarding of this tender will be in terms of the Supply Chain Management Policy of the SDM. Clause 36.5 of the Supply Management Policy which entails balance between financial offer and functionality. **The following steps will be followed in evaluation;** 1. Determination of whether or not tender offers are complete. 2. Determination of whether or not tender offers are responsive. 3. Determination of the reasonableness of tender offers. 4. Confirmation of the eligibility of preferential points claimed by bidders. 5. Determination of expertise and experience of bidders. 6. Awarding of points for functionality. 7. Ranking of bidders according to the total points 8. Performance of risk analysis by checking the capacity of the bidders

5.11.9	EVALUATION OF TENDER OFFERS (Project specific, will be updated after approval from department) <u>Prequalification / Quality Criteria</u> Tenderers will be assessed based on the prequalification criteria as set out in the table below. Tenderers scoring less than 70% will be considered non-responsive based on items 1 to 5 below: 1.Company Experience 2.Bank Rating 3.Experience Project Personnel 4.Key Personnel 5.Plant and Equipment Tenderers shall fill in the relevant information on the Prequalification / Quality Criteria Schedules in Part T2 and this information shall be used to award points for functionality on the following basis per category:

No. **1**	**Functionality Criteria – Tender Rating Matrix**		**A** **Tenderer rating (Score1-5)**	**B** **Weight-ing**	**C** **Tenders Score (%) =(AxB)/5**
	Company work experience as per FormD1	5 or more water reticulation projects greater than R3m construction value successfully completed in last 10years**. (As proof, attach completion certificates together with appointment letter OR practical completion certificates with appointment letter for projects that reached practical completion within 12 months prior to the advertisement of this tender).**	5	30	
		4 water reticulation projects greater than R3m construction value successfully completed in last 10 years**. (As proof, attach completion certificates together with appointment letter OR practical completion certificates with appointment letter for projects that reached practical completion within 12 months prior to the advertisement of this tender).**	4		
		3 water reticulation projects greater than R3m construction value successfully completed in last 10 years**.(As proof, attach completion certificates together with appointment letter OR practical completion certificates with appointment letter for projects that reached practical completion within 12 months prior to the advertisement of this tender).**	3		
		2 water reticulation projects greater than R3m construction value successfully completed in last 10 years**. (As proof, attach completion certificates together with appointment letter OR practical completion certificates with appointment letter for projects that reached practical completion within 12 months prior to the advertisement of this tender)**	2		
		1 water reticulation project greater than R3m construction value successfully completed in last 10 years. **(As proof, attach completion certificates together with appointment letter OR practical completion certificates with appointment letter for projects that reached practical completion within 12 months prior to the advertisement of this tender)**	1		

SDM:	**Witness 1:**	**Witness 2:**	**Tenderer:**	**Witness 1:**	**Witness 2:**

No.	Quality Criteria – Tender Rating Matrix		A Tenderer rating (Score1-5)	B Weight-ing	C Tenders Score (%) = (A x B)/5
2	Form A8(Attach Bank Rating Certificate as proof)	The bank certificate with the original bank stamp and signature. A – rating	5	10	
		The bank certificate with the original bank stamp and signature. B – rating	4		
		The bank certificate with the original bank stamp and signature. C – rating	3		
		The bank certificate with the original bank stamp and signature. D – rating	2		
		The bank certificate with the original bank stamp and signature. E and F rating	1		

Item 3. Personnel Considered as key for the Project are as follows (Table D3):

No.	Quality Criteria – Tender Rating Matrix	A Tenderer rating Score	B Score	C Points obtained
Contract Manager	BSc/B-Tech/National Diploma in civil engineering (Professionally registered with (SACPCMP or ECSA)	12	30	
Site Agent	BSc/B-Tech/National Diploma in civil engineering	8		
Foreman	Diplomas, Higher Certificates and Advanced National (vocational) Cert. or relevant qualification and experience in civil engineering works. minimum qualification of NQF Level 5	6		
Safety Officer	Relevant safety qualification as prescribed by the construction regulation Professionally registered Health and safety officer (Pr. CHSO)	4		
		SUB TOTAL:		

Evaluation Criteria	Number of comparable projects involved in with water reticulation projects with relevant criteria	Points Obtainable
Contracts Manager	0	0
	1 - 2	4
	3 - 4	8
	5 upwards	12
Site Agent	0	0
	1 - 2	2
	3 - 4	4
	5 upwards	8
Foreman	0	0
	1 - 2	2
	3 - 4	4
	5 upwards	6
Safety Officer	0	0
	1 - 2	1
	3 - 4	2
	5 upwards	4

Please note that the personnel required on this tender shall remain valid for the duration of the project, approval from the department should be sourced for any change in personnel with similar or higher requirements. The personnel required as above should be available for construction and filled out on form D3: Schedule of contractor's key personnel.

Item 4. Plant and Equipment

No.	Quality Criteria – Tender Rating Matrix	A	B	C
		Tenderer rating (Score1-5)	Weight-ing	Tenders Score (%) = Sub-total A x B

4*	TARGETED GOALS (All plant to be owned. Attach proof of ownership)	TENDERED GOAL	POINTS Claimed by tenderer			
	2 x TLB	8			1	
	2 x Pedestrian roller compactor	4				
	2 x Excavator	8				
	1 x Water truck (10000lt)	4				
	2 x 6 Ton Tipper Truck	6				
	SUB TOTAL:	**30 Max**				

Note: Letter of Intent for hired plant must not be older than 3 months from the date of tender closing and proof of ownership must be attached. Failure to submit information as requested will result in non-allocation of points.

TOTAL SCORE (%)	
NB: The winning bidder to ensure that this information remain valid for the duration of the contract.	

Clause Number	Tender Data
5.13	In addition to the requirements of the Condition of Tender, offers will only be accepted if: ● The tenderer has in his or her possession an original valid Tax Clearance Certificate issued by the South African Revenue Services or has made arrangements to meet outstanding tax obligations; ● The tenderer is registered with the Construction Industry Development Board with an appropriate contractor grading designation; ● The tenderer or any of its directors is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; ● The tenderer has not abused the Employer's supply chain management system; ● The tenderer has not failed to perform on any previous contract and has not been given a written notice to this effect; ● The tenderer is registered on the National Treasury Central Supplier Database; ● To attend a compulsory briefing session and site inspection. Signing the briefing and site inspection attendance register is mandatory;

Clause Number	Tender Data
	● The tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the Employer or potentially compromise the tender process; ● Tenderers must submit proof of subcontracting arrangement between the main tenderer and subcontractors.
5.17	The number of paper copies of the signed contract to be provided by the Employer is 1.
5.19	All requests shall be in writing.
ADDITIONAL CONDITIONS OF TENDER CLAUSES:	
3.7	**Jurisdiction** Unless stated otherwise in the tender data, each tenderer and the Employer undertake to accept the jurisdiction of the law courts of the Republic of South Africa.
5.20	**TENDERER'S DIRECT PARTICIPATION OF TARGETED LABOUR JOB CREATION** In line with the National Government Policies and Strategies, the Department promotes the use of labour where feasible and hence specifies a minimum Job Creation content to ensure tenderers align with the development goals. **Minimum Job Creation Content for this contract is set at 2.5 Full Time Equivalent (FTE) Jobs per R'm Contract Price.** Where 1 FTE Job = 230 labour days of employment. Contract Price is the tender sum amount including VAT, Contract Price Adjustment (CPA) and Contingencies. During Construction failure to meet the job creation content will result in the following penalty per shortfall in FTE Jobs Created. **Penalty per FTE job shortfall = 230 (days) x 160 (rand per labour day) x 5%**
5.21	**Subcontracting as a condition of tender for procurement above R30 million** A person awarded a contract may only enter into Sub-Contracting agreement with the approval to the organ of state.

Standard Conditions of Tender as contained in SANS 10845-3: 2015 Edition 1

Standard Conditions of Tender

1 Scope

This part of ISO 10845 sets out standard conditions of tender which:

a) bind the employer and tenderer to behave in a particular manner,

b) establish what a tenderer is required to do in order to submit a compliant tender,

c) make known the evaluation criteria to tenderers, and

d) establish the manner in which the employer conducts the process of offer and acceptance and provide the necessary feedback to tenderers on the outcomes of the process.

This part of ISO 10845 is intended for use in procurements relating to goods, services and construction works and disposals other than by auction.

NOTE 1 Annex A contains commentary on the clauses in this part of ISO 10845. Annex B provides guidance on how to develop the tender data for a procurement document using this part of ISO 10845.

NOTE 2 ISO 10845-2 establishes the manner in which procurement documents should be formatted and compiled. The standard conditions contained in this part of ISO 10845 may by reference be incorporated in procurement documents formatted and compiled in accordance with the provisions of ISO 10845-2.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1 Bill of quantities

document that lists the items of work and the quantities and rates associated with each item to allow contractors to be paid, at regular intervals, an amount equal to the agreed rate for the work multiplied by the quantity of work completed

[ISO 10845-1:2010, definition 3.3]

2.2 Bond

sum of money or securities submitted to the employer or placed in the hands of a third party to guarantee completion of the work and recovery of the sums which the contractor would be recognized as owing under the terms of the contract

NOTE Adapted from ISO 6707-2:1993, definition 3.5.4.

2.3 Comparative offer

tenderer's financial offer after all tendered parameters that can affect the value of the financial offer have been taken into consideration to enable comparisons to be made on a comparable basis

2.4 Conflict of interest

any situation in which someone in a position of trust has competing professional or personal interests which make it difficult for him to fulfil his duties impartially, an individual or organization is in a position to exploit a professional or official capacity in some way for his personal or for corporate benefit, or incompatibility or contradictory interests exist between an employee and the organization which employs that employee

[ISO 10845-1:2010, definition 3.8]

2.5 Contract data

document that identifies the applicable conditions of a contract and states the associated contract-specific data

[ISO 10845-1:2010, definition 3.10]

2.6 Corrupt practice

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

NOTE Adapted from ISO 10845-1:2010, definition 3.13.

2.7 Employer

person or organization intending to or entering into a contract with the contractor for the provision of goods, services, or engineering and construction works

[ISO 10845-1:2010, definition 3.17]

2.8 Form of offer and acceptance

document that formalizes the legal process of offer and acceptance

[ISO 10845-2:2011, definition 2.15]

2.9 Form of securities

document that provides for the securities required by the employer

[ISO 10845-2:2011, definition 2.16]

2.10 Fraudulent practice

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

NOTE Adapted from ISO 10845-1:2010, definition 3.20.

2.11 Joint venture

grouping of two or more contractors acting as one legal entity, where each is liable for the actions of the other

[ISO 6707-2:1993, definition 3.4.22]

2.12 Organization

company, firm, enterprise, association or other legal entity, whether incorporated or not, or a public body

[ISO 10845-1:2010, definition 3.23]

2.13 Quality

totality of features and characteristics of a product or service that bears on the ability of the product or service to satisfy stated or implied needs

[ISO 10845-1:2010, definition 3.35]

2.14 Returnable document

document that a tenderer is required to complete and submit to the employer as part of his tender submission

[ISO 10845-2:2011, definition 2.22]

2.15 Scope of work

document that specifies and describes the goods, services, or engineering and construction works which are to be provided, and any other requirements and constraints relating to the manner in which the contract work is to be performed

[ISO 10845-1:2010, definition 3.37]

2.16 Tender data

document that establishes the tenderer's obligations in submitting a tender and the employer's undertakings in administering the tender process and evaluating tender offers

[ISO 10845-1:2010, definition 3.45]

2.17 Tender offer

written offer for the provision of goods, or to carry out a service or engineering and construction works under given conditions, usually at a stated price, and which is capable of acceptance and conversion into a binding contract

[ISO 10845-1:2010, definition 3.46]

2.18 Tenderer

person or organization that submits a tender offer

[ISO 10845-1:2010, definition 3.47]

3 General requirements

3.1 Actions

The employer and each tenderer submitting a tender offer shall comply with the standard conditions of tender. In their dealings with each other, they shall discharge their duties and obligations, as set

out in Clauses 4 and 5, in a timely manner and with integrity, behave equitably, honestly and transparently, comply with all legal obligations and not engage in anti-competitive practices.

The employer and the tenderer, and all the 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.

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.

NOTE 1 A conflict of interest can arise due to a conflict of roles which can provide an incentive for improper acts in some circumstances or positions. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in said circumstance or position, even if no improper acts result.

NOTE 2 Conflicts of interest with respect to 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 can in any way affect any decisions taken.

3.2 Tender documents

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

3.3 Interpretation

The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of the standard conditions of tender in this part of ISO 10845.

The standard conditions of tender contained in this part of ISO 10845, 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.

3.4 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 read, copied and recorded, and in the language stated in the tender data. 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.

3.5 Employer's right to accept or reject any tender offer

The employer may accept or reject any 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 written reasons for such action upon written request to do so.

The employer may not, subsequent to the cancellation or abandonment of a tender process or the rejection of all responsive tender offers, re-issue a tender covering substantially the same scope of work within a period of six months unless only one tender was received, and such tender was returned unopened to the tenderer.

3.6 Procurement procedures

3.6.1 General

Unless otherwise stated in the tender data, a contract shall, subject to 5.13, be concluded with the tenderer who, in terms of 5.11, 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.

3.6.2 Competitive negotiation procedure

Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of 5.4, the employer shall only announce the names of the tenderers who make a submission. The requirements of 5.8, relating to the material deviations or qualifications which affect the competitive position of tenderers, shall not apply.

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 4.17, 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.

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.

The contract shall be awarded in accordance with the provisions of 5.11 and 5.13 after tenderers have been requested to submit their best and final offer.

3.6.3 Proposal procedure using the two-stage tendering system

3.6.3.1 Option 1

In the first stage, tenderers shall 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.

In the second stage, the employer shall negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of the standard conditions of tender.

3.6.3.2 Option 2

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

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 the standard conditions of tender in this part of ISO 10845.

4 Tenderer's obligations

The tenderer shall comply with the following obligations.

4.1 Eligibility

4.1.1 Submit a tender offer

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

4.1.2 Notify the employer

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 before the closing time for tenders.

4.2 Cost of tendering

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

4.3 Checking documents

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

4.4 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.

4.5 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 incorporated into the tender documents by reference.

4.6 Acknowledging 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.

4.7 Clarification meeting

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

4.8 Seeking clarification

Unless otherwise notified in the tender data, 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.

4.9 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.

4.10 Pricing the tender offer

Include in the rates, prices, and the tendered total of the prices (if any), all duties, taxes which the law requires to be paid [except value added tax (VAT)], and other levies payable by the successful tenderer, that are applicable 14 days before the closing time stated in the tender data.

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

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.

State the rates and prices in monetary value of the contract unless otherwise instructed in the tender data.

NOTE The contract data can provide for part payment in other currencies.

4.11 Alterations to documents

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

Do not make erasures using masking fluid.

4.12 Alternative tender offers

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.

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.

4.13 Tender submissions

4.13.1 General submission requirements

Submit one tender offer only, either as a single entity or as a member in a joint venture, to provide the whole of the works, services or supply identified in the draft contract, unless otherwise stated in the tender data.

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.

Submit:

a) the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with a translation of any documentation in a language other than the language of communication established in 3.4, and

b) the parts communicated electronically in the same format as they were issued by the employer.

4.13.2 Signatures

Sign the original and all copies of the tender offer where required in terms of the tender data.

State in the case of a joint venture which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

NOTE The employer holds all authorized signatories liable on behalf of the tenderer.

4.13.3 Tender securities

Submit, as required as part of the tender submission, a tender security from a bank or insurer that is in a strong enough commercial position to carry such security in the name of the tenderer, or in the names of each of the members of a joint venture, in the amount, for the period and in the form specified in the tender data.

4.13.4 Inclusion of certificates

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

4.13.5 Sealing of documents

Seal the original and each copy of the tender offer as separate packages, marking the packages as "ORIGINAL" and "COPY". Unless otherwise specified in the tender data, seal the "ORIGINAL" and "COPY" packages in a single package and state on the outside of such package the employer's address and identification details specified in the tender data, as well as the tenderer's name and contact address.

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 "NON-FINANCIAL PROPOSAL". State on the outside of each envelope the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address. 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 specified in the tender data.

4.13.6 Employer's acceptance of tender submissions

Accept that the employer does 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.

Accept that the employer shall not accept tender offers submitted by telegraph, telex, facsimile or e-mail, unless otherwise stated in the tender data.

4.14 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 being non-responsive.

4.15 Closing time

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. Proof of posting shall not be accepted as proof of delivery. Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of the standard conditions of tender in this part of ISO 10845 apply equally to the extended deadline.

4.16 Tender offer validity

4.16.1 Period of validity

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.

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. Extend the period of the tender security, if any, to cover any agreed extension requested by the employer.

4.16.2 Withdrawal of tenders

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.

Where a tender submission is to be substituted, submit a substitute tender in accordance with the requirements of 4.13 with the packages clearly marked as "SUBSTITUTE".

4.17 Clarification of tender offer after submission

Provide clarification of a tender offer during the evaluation of tender offers, in response to a request from the employer to do so.

NOTE Such clarifications can 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.

4.18 Other material

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 being non-responsive.

Dispose of samples of materials provided for the employer's evaluation.

4.19 Inspections, tests and analysis

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

4.20 Submitting 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.

4.21 Checking final draft

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

4.22 Returning other tender documents

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

5 Employer's undertakings

The employer shall carry out the following undertakings.

5.1 Responding to requests from the tenderer

Unless otherwise notified 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 obtained procurement documents.

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 pre-qualify a tenderer to submit a tender offer in terms of a previous procurement process.

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 comply with any of the collective or individual qualifying requirements,

b) the new partners to a joint venture were not pre-qualified 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 pre-qualification process.

5.2 Issuing addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date that tender documents are available until, unless otherwise notified in the tender data, three working days before the tender closing time stated in the tender data.

If, as a result of the issuing of addenda, it is necessary to extend the closing time stated in the tender data, grant such extension and notify all respondents accordingly.

5.3 Returning 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.

5.4 Opening of tender submissions

Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers 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 are not opened.

Announce at the meeting held immediately after the receipt 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 the tenderer's prices, preferences claimed and time for completion, for the main tender offer only.

Make available, upon request, to all interested persons the record of tender parameters that are announced in respect of each tender received.

5.5 Two-envelope system

Where stated in the tender data that a two-envelope system has been followed, open only the non-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.

Evaluate the non-financial 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 are to be opened.

Open only the financial proposals of tenderers who, in the quality evaluation score, have more than the minimum number of points for quality stated in the tender data, and announce the score obtained for the non-financial proposals and the total price and any preferences claimed. Return unopened financial proposals to tenderers whose non-financial proposals failed to achieve the minimum number of points for quality.

5.6 Non-disclosure

Do not disclose to tenderers, or to any 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.

5.7 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 said tenderer's offer) if it is established that the tenderer engaged in corrupt or fraudulent practices.

5.8 Test for responsiveness

Determine, after opening and before detailed evaluation, whether each tender offer that was properly received:

a) complies with the requirements of the standard conditions of tender in this part of ISO 10845,

b) has been properly and fully completed and signed, and

c) is responsive to the other requirements of the tender document. A responsive tender is one that conforms to all the terms, conditions, and scope of work 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 do not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

5.9 Arithmetical errors, omission and discrepancies

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.

Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with 5.11 for:

a) the gross misplacement of the decimal point in any unit rate,

b) omissions made in completing the pricing schedule or bill of quantities, or

c) arithmetical errors in

    1) line item totals resulting from the product of a unit rate and a quantity in bill of quantities or schedules of prices, or

    2) the summation of the prices.

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

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

a) If a bill 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 shall be asked to revise selected item prices (and their rates if bill of quantities apply) to achieve the tendered total of the prices.

Consider the rejection of a tender offer if the tenderer does not correct or accept the correction of errors in the required manner.

5.10 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.

5.11 Evaluation of tender offers

5.11.1 General

Appoint an evaluation panel to evaluate submissions. Ensure that not less than three persons evaluate quality in terms of 5.11.9.

Reduce each responsive tender offer to a comparative offer and evaluate submissions using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

5.11.2 Method 1: Financial offer

In the case of a financial offer:

a) rank tender offers from the most favourable to the least favourable comparative offer, and

b) recommend the highest ranked tenderer for the award of the contract, unless there are compelling and justifiable reasons not to do so.

Re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest ranked tender, and recommend the highest ranked tenderer, unless there are compelling and justifiable reasons not to do so, in which case the process set out in this subclause shall be repeated.

5.11.3 Method 2: Financial offer and quality

In the case of a financial offer and quality,

a) score each tender in respect of the financial offer made and quality offered in accordance with the provisions of 5.11.7 and 5.11.9, rejecting all tender offers that fail to score the minimum number of points for quality stated in the tender data, if any,

b) calculate the total number of tender evaluation points (T_{EV}) in accordance with the following formula:

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

where:

N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with 5.11.7;

N_Q is the number of tender evaluation points awarded for quality offered in accordance with 5.11.9,

c) rank tender offers from the highest number of tender evaluation points to the lowest, and

d) recommend the tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.

Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points, and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so, in which case the process set out in this subclause shall be repeated.

5.11.4 Method 3: Financial offer and preferences

In the case of a financial offer and preferences

a) score each tender in respect of the financial offer made and the preferences claimed, if any, in accordance with the provisions of 5.11.7 and 5.11.8,

b) calculate the total number of tender evaluation points (T_{EV}) in accordance with the following formula:

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

where:

N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with 5.11.7;

N_P is the number of tender evaluation points awarded for preferences claimed in accordance with 5.11.8,

c) rank tender offers from the highest number of tender evaluation points to the lowest, and

d) recommend the tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.

Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so, in which case the process set out in this subclause shall be repeated.

5.11.5 Method 4: Financial offer, quality and preferences

In the case of a financial offer, quality and preferences:

a) score each tender in respect of the financial offer made, the preference claimed, if any, and the quality offered in accordance with the provisions of 5.11.7 to 5.11.9, rejecting all tender offers that fail to score the minimum number of points for quality stated in the tender data, if any,

b) calculate the total number of tender evaluation points (T_{EV}) in accordance with the following formula, unless otherwise stated in the tender data:

$$\boldsymbol{T_{EV} = N_{FO} + N_P + N_Q}$$

where:

N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with 5.11.7;

N_P is the number of tender evaluation points awarded for preferences claimed in accordance with 5.11.8,

N_Q is the number of tender evaluation points awarded for quality offered in accordance with 5.11.9,

c) rank tender offers from the highest number of tender evaluation points to the lowest, and

d) recommend the tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.

Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points, and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so, in which case the process set out in this subclause shall be repeated.

5.11.6 Decimal places

Score financial offers, preferences and quality, as relevant, to two decimal places.

5.11.7 Scoring financial offers

Score the financial offers using the following formula:

$$\boldsymbol{N_{FO} = W_1 \text{x} A}$$

where:

N_{FO} is the number of tender evaluation points awarded for the financial offer;

W_1 is the maximum possible number of tender evaluation points awarded for the financial offer as stated in the tender data;

A is the number calculated using the relevant formula described in Table 1, as stated in the tender data.

Table 1: Formulae for calculating the value of *A*[a]

Formula number	Basis for comparison	Formula

1	Highest price or discount	P/P_m
2	Lowest price or percentage commission or fee	P_m/P
P_m is the comparative offer of the most favourable comparative offer. *P* is the comparative offer of the tender offer under consideration.		

5.11.8 Scoring preferences

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

Calculate the total number of tender evaluation points for preferences (NP) claimed in accordance with the provisions of the tender data.

5.11.9 Scoring quality

Score each of the criteria and subcriteria for quality in accordance with the provisions of the tender data.

Calculate the total number of tender evaluation points for quality (N_Q) using the following formula:

$$\boldsymbol{N_Q = W_2\, x\, S_0/M_S}$$

where:

W_2 is the maximum possible number of tender evaluation points awarded for the quality as stated in the tender data;

S_0 is the score for quality allocated to the submission under consideration;

M_S is the maximum possible score for quality in respect of a submission.

5.12 Insurance provided by the employer

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

5.13 Acceptance of a tender offer

Accept a tender offer should it be considered not to present any unacceptable commercial risk, only if the tenderer:

a) is not under restrictions, or has principals who are under restrictions, preventing participation in the employer's procurement,

b) can, as necessary and in relation to the proposed contract, demonstrate the possession of the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and personnel, to perform the contract,

c) has the legal capacity to enter into the contract,

d) is not insolvent, in receivership, bankrupt or being liquidated, does not have affairs administered by a court or a judicial officer, does not have suspended business activities, or is subject to legal proceedings with respect to 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.

5.14 Preparing contract documents

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 during the process of offer and acceptance.

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

5.15 Completing adjudicator's contract

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

5.16 Notice to successful and unsuccessful tenderers

Notify the successful tenderer of the employer's acceptance of the tender offer by completing and returning one copy of the form of offer and acceptance before the expiry of the validity period stated in the tender data, or agreed additional period.

After the successful tenderer has been notified of the employer's acceptance of the tender, notify other tenderers that their tender offers have not been accepted.

5.17 Providing copies of the contracts

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

5.18 Returning of tender securities

Return tender securities to the successful tenderer and unsuccessful tenderers before the expiry period stated in the tender data or in the tender security.

5.19 Providing written reasons for actions taken

Provide, upon request, written reasons to tenderers for any action that is taken in applying any of this part of ISO 10845, but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers and respondents or which might prejudice fair competition between tenderers.

PART T2 RETURNABLE SCHEDULES

TENDER NO: SK8/3/1-22/2024/25 **CIDB Category 7 CE or Higher**

FOR

PROJECT NAME: CONSTRUCTION OF MOUTSE EAST AND WEST WATER RETICULATION PHASE 2: ELOKHISHINI, PHOOKO AND PHOOKWANE – CONTRACT 2D

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T2.1 LIST OF RETURNABLE DOCUMENTS

The tenderer must complete the following returnable schedules:

Notes to tenderer:

1. **Returnable schedules have been separated into the following categories:**
   - **Forms, certificates and schedules for completion by the tenderer for use in the quantitative and qualitative evaluation of the tender (Forms A-F)**
   - **A list of other returnable documents for completion by the tenderer and which will subsequently be incorporated into the contract (Section C1: Agreement and Contract data)**
2. **Failure to fully complete all the relevant returnable documents may render such a tender offer unresponsive.**
3. **Tenderers shall note that their signature appended to each returnable form represents a declaration that they vouch for the accuracy and correctness of the information provided.**
4. **Notwithstanding any check or audit conducted by or on behalf of the Employer, the information provided in the returnable documents is accepted in good faith and as justification for entering into a contract with a tenderer. If subsequently any information is found to be incorrect such discovery shall be taken as wilful misrepresentation by that tenderer to induce the contract. In such event the Employer has the discretionary right under sub-clause 9.2 of the general conditions of to terminate the contract.**
5. **Should a tenderer wish to offer a different period of completion than that required by the Employer, it shall be submitted as an alternative tender.**
6. **If more than one alternative tender is submitted, each one shall be numbered and submitted on a separate copy of form C1.1 Form of Offer, completed and signed, and accompanied by the prescribed priced Pricing Schedule and supporting documents.**
7. **A retention money guarantee will be considered for acceptance in lieu of cash deductions provided that the tenderer submits his proposal as an alternative tender indicating the discount he proposes to give.**
8. **These forms must be completed in black ink and any alterations made prior to tender closure countersigned by an authorised signatory.**

TENDERERS ARE INSTRUCTED TO COMPLETE ALL THE SCHEDULES ATTACHED HEREIN.FAILURE TO COMPLETE ANY OF THE SCHEDULES MAY RESULT IN AUTOMATIC DISQUALIFICATION OF THE TENDER AS THE TENDER WILL BE CONSIDERED NOT RESPONSIVE. IF THE SCHEDULE IS NOT APPLICABLE TENDERERS ARE INSTRUCTED TO INDICATE NOT APPLICABLE AND SIGN THE SCHEDULE

TENDER COMPLIANCE

LIST OF RETURNABLE DOCUMENTS.

The tenderer must complete the returnable documents as listed.

Administrative Requirements	**Tick if completed**
Certificate of Authority for Joint Venture *(Compulsory where applicable)*	
Certified copy of identity documents for directors not older than six months	
Copy of Company Registration Documents or CK1 for Close Corporations	
Valid Tax Clearance Certificate Issued by the South African Revenue Service*/ PIN issued by SARS*	
Compliant CSD Registration/CSD Summary Report	
Initial All Pages (Required for Evaluation)	
Legislation Requirements (Compulsory)	**Tick if completed**
Invitation to Bid, Part A & B (MBD 1)	
Declaration of Interest (MBD4)	
Bids less than R10 million • If the estimated value of the transaction is less than R10 million, the bid documentation must require the bidders to furnish: • The Municipal rates for the bidder and its directors in respect of which payment is not overdue for more than 90 days or proof of lease agreement including rates for the landlord. In case where the Company or Director is registered in a rural area where the rates are not paid, please attach proof from Local Authority and Affidavit under oath indicating that there are no municipal rates payable	
Bids exceeding R10 million • If the estimated value of the transaction exceeds R10 million, the bid documentation must require the bidders to furnish: • if the bidder is required by law to prepare annual financial statements for auditing, their audited annual financial statements for the past three years, or • since their establishment if established during the past three years. • A certificate signed by the bidder certifying that the bidder and any of its directors has no undisputed commitments for municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 30 days. • Municipal rates for the bidder and its directors in respect of which payment is not overdue for more than 30 days or proof of lease agreement including rates for the landlord. In case where the company or Director is registered in a rural area where the rates are not paid, please attach proof from Local Authority and Affidavit under oath indicating that there are no municipal rates payable.	
Declaration For Procurement Above R10 Million (Vat Included) (MBD 5)	
Preference Points Claim Form in Terms of the Preferential Procurement Regulations 2022 (MBD 6.1)	
Contract Form - Rendering of Services (MBD 7.2)	
Declaration of Bidder's Past Supply Chain Management Practices (MBD8)	
Certificate of Independent Bid Determination (MBD9)	
Schedule 1A**:** Compulsory Enterprise Questionnaire	
Schedule 1B: Authority for Signatory	
Form of offer to be properly signed	
Proof of CIDB grading	
COIDA (Compulsory)	
Proof of Insurance (Letter of intent)	

Note:

The meaning of the cursive type for each Form is as follows:

- ***Compulsory***: Documentation or Information that must be submitted with the tender (Failing to submit any if the document may result in the tender being deemed non-responsive).
- ***Required for evaluation****:* Additional documentation that is required to be submitted with the tender and will be used as part *of the tender evaluation.*
- It is the responsibility of the bidder to bind the bid document.

FORM NO	FORM DESCRIPTION	TICK IF COMPLETED
A1	ATTENDANCE REGISTER	
A5	TENDERER'S BANK DETAILS AND CREDIT RATING FROM BANK	
A6	CERTIFICATE OF TENDERER'S LITIGATION HISTORY	
A7	SCHEDULE OF CURRENT COMMITMENTS	
A8	CERTIFICATE OF COMPLIANCE WITH OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 AND CONSTRUCTION REGULATIONS, 2014	
A9	CERTIFICATE OF REGISTRATION WITH CIDB	
B1	CONTRACTORS ESTABLISHMENT ON SITE	
MBD 6.1	PREFERENCING SCHEDULE: BROAD-BASED BLACK ECONOMIC EMPOWERMENT STATUS	
C2	PREFERENTIAL PROCUREMENT: SUBCONTRACTING	
D1	SCHEDULE OF WORK EXPERIENCE	
D2	SCHEDULE OF CONSTRUCTION EQUIPMENT	
D3	SCHEDULE OF CONTRACTORS KEY PROJECT MANAGEMENT	
D4	SCHEDULE OF SPECIALIST SUBCONTRACTORS	
D5	INDICATIVE CONSTRUCTION PROGRAMME	
D6	SCHEDULE OF ESTIMATED MONTHLY EXPENDITURE	
D7	SWORN AFFIDAVIT	
E1	QUALITY ASSURANCE	
MBD 7.2	CONTRACT FORM – RENDERING OF SERVICES	

T2.2 RETURNABLE SCHEDULES

FORM A1: ATTENDANCE REGISTER FOR CLARIFICATION MEETING

Notes to Tenderer:

1. **Tenderers must attend the clarification meeting. And they must ensure that suitably qualified or experienced personnel attend the meeting.**

2. **Tenderers must ensure that those who attend the meeting on their behalf complete the official attendance register. Attendees must fill in the tenderers' names and contact details and they must sign the register. If they do not, the offers of the tenderers they represent at the meeting will be considered non-responsive.**

FORM A2: CERTIFICATE OF AUTHORITY FOR SIGNATORY

Notes to tenderer:

1. **The signatory for the tenderer shall confirm his/her authority thereto by attaching on the tendering company's letterhead a duly signed and dated copy of the relevant resolution of the board of directors/partners.**

2. **In the event that the tenderer is a joint venture, a certificate is required from each member of the joint venture clearly setting out:**

   - **authority for signatory,**
   - **undertaking to formally enter into a joint venture contract should an award be made to the joint venture,**
   - **name of designated lead member of the intended joint venture, as required by tender condition4.13.2**

3. **The resolution below is given as an example of an acceptable format for authorisation, but submission of this page with the example completed shall not be accepted as authorisation of the tenderer's signatory.**

By resolution of the board of directors passed at a meeting held on .....

Mr/Ms .....,
whose signature appears below, has been duly authorised to sign all documents in connection with the tender for

PROJECT NAME:

and any contract which may arise therefrom on behalf of ***(enter name of tenderer in block capitals)***

.....

SIGNED ON BEHALF OF THE COMPANY:.....

IN HIS/HER CAPACITY AS:.....

DATE: .....

SIGNATURE OF SIGNATORY: .....

WITNESS: ....
SIGNATURE SIGNATURE

....
NAME (PRINT) NAME (PRINT)

Pro-forma

FORM A3: COMPULSORY DECLARATION

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

Section 1: Enterprise details

Name of enterprise	
Contact person	
Email	
Telephone	
Cell	
Fax	
Physical address	
Postal address	

Section 2: Particulars of companies and close corporations

Company/Close Corporation registration number	

Section 3: SARS information

Tax reference number	
VAT registration number	(state *Not Registered* if not registered for VAT)

Section 4: CIDB registration number

CIDB Registration number *(if applicable)*	

Section 5: Particulars of principals

principal: means a natural person who is a partner in a partnership, a sole proprietor, a director of a company established in terms of the Companies Act of 2008 (Act No. 71 of 2008) or a member of a close corporation registered in terms of the Close Corporations Act, 1984, (Act No. 69 of 1984).

Full name of principal	Identity number	Personal tax reference number

Attach separate page if necessary.

Section 6: Record in the service of the state

Indicate, by marking the relevant boxes with a cross, if any principal is currently or has been within the last 12 months in the service of any of the following:

☐ a member of any municipal council

☐ a member of any provincial legislature

☐ a member of the National Assembly or the National Council of Provinces

☐ a member of the board of directors of any municipal entity

☐ an official of any municipality or municipal entity

☐ an employee of any department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act of 1999 (Act No. 1 of 1999)

☐ a member of an accounting authority of any national or provincial public entity

☐ an employee of Parliament or a provincial legislature

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

Name of principal	**Name of institution, public office, board or organ of state and position held**	**Status of service** (tick appropriate column)	
		Current	**Within last 12 months**

Insert separate page if necessary.

Section 7: Record of family member in the service of the state

family member: a person's spouse, whether in a marriage or in a customary union according to indigenous law, domestic partner in a civil union, or child, parent, brother, sister, whether such a relationship results from birth, marriage or adoption

Indicate, by marking the relevant boxes with a cross, if any family member of a principal as defined in section 5 is currently or has within the last 12 months been in the service of any of the following:

☐ a member of any municipal council

☐ a member of any provincial legislature

☐ a member of the National Assembly or the

☐ an employee of any department, national or provincial public entity or constitutional institution with in the meaning of the Public Finance Management Act of 1999 (Act No. 1 of

National Council of Provinces

☐ a member of the board of directors of any municipal entity

☐ an official of any municipality or municipal entity

1999)

☐ a member of an accounting authority of any national or provincial public entity

☐ an employee of Parliament or a provincial legislature

Name of family member	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

Insert separate page if necessary.

Section 8: Record of termination of previous contracts with an organ of state

Was any contract between the tendering entity, including any of its joint venture partners, terminated during the past five years for reasons other than the employer no longer requiring such works or the employer failing to make payment in terms of the contract?

☐ Yes ☐ No

If yes, provide particulars.

(insert separate page if necessary).

Section 9: Declaration

The undersigned, who warrants that he/she is duly authorised to do so on behalf of the tendering entity, confirms that the contents of this Declaration are within my personal knowledge, save where stated otherwise in an attachment hereto, and to the best of my belief is both true and correct, and that:

i) neither the name of the tendering entity, nor any of its principals, appears on:

   a) the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004 (Act No. 12 of 2004); or

   b) National Treasury's Database of Restricted Suppliers (see www.treasury.gov.za);

ii) the tendering entity or any of its principals has not been convicted of fraud or corruption by a court of law (including a court outside of the Republic of South Africa) within the last five years;

iii) any principal who is presently employed by the state has the necessary permission to undertake remunerative work outside such employment (attach permission to this declaration);

iv) the tendering entity is not associated, linked or involved with any other tendering entities submitting tender offers;

v) the tendering entity has not engaged in any prohibited restrictive horizontal practices, including consultation, communication, agreement, or arrangement with any competing or potential tendering entity regarding prices, geographical areas in which goods and services will be rendered, approaches to determining prices or pricing parameters, intentions to submit a tender or not, the content of the submission (specification, timing, conditions of contract, etc.) or intention to not win a tender;

vi) the tendering entity has no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest;

vii) neither the tenderer nor any of its principals owes municipal rates and taxes or municipal service charges to any municipality or a municipal entity, and are not in arrears for more than three months;

viii) SARS may, on an on-going basis during the term of the contract, disclose the tenderer's tax compliance status to the Employer and, when called upon to do so, obtain the written consent of any subcontractors who are subcontracted to execute a portion of the contract that is entered into in excess of the threshold prescribed by National Treasury, for SARS to do likewise.

Signed: _____ Date: _____

Name: _____ Position: _____

Enterprise name: _____

NOTE 1: The Standard Conditions of Tender contained in SANS 10845-3 prohibits anticompetitive practices (clause 3.1) and requires that tenderers avoid conflicts of interest, only submit a tender offer if the tenderer or any of his principals is not under any restriction to do business with the Employer (4.1.1) and submit only one tender either as a single tendering entity or as a member in a joint venture (clause 4.13.1). Clause 5.7 also empowers the Employer to disqualify any tenderer who engages in fraudulent and corrupt practice. Clause 3.1 also requires tenderers to comply with all legal obligations.

FORM A4: TAX COMPLIANCE

MBD 2

It is a condition of bid that the taxes of the successful bidder must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the bidder's tax obligations.

1. In order to meet this requirement bidders are required to complete in full the attached form TCC 001 "Application for a Tax Clearance Certificate" and submit it to any SARS branch office nationally. The Tax Clearance Certificate Requirements are also applicable to foreign bidders / individuals who wish to submit bids.

2. SARS will then furnish the bidder with a Tax Clearance Certificate that will be valid for a period of 1 (one) year from the date of approval.

3. The original Tax Clearance Certificate must be submitted together with the bid. Failure to submit the original and valid Tax Clearance Certificate will result in the invalidation of the bid. Certified copies of the Tax Clearance Certificate will not be acceptable.

4. In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Clearance Certificate.

5. Copies of the TCC 001 "Application for a Tax Clearance Certificate" form are available from any SARS branch office nationally or on the website www.sars.gov.za.

6. Applications for the Tax Clearance Certificates may also be made via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.

FORM A5: TENDERER'S BANK DETAILS AND CREDIT RATING FROM BANK

Notes to tenderer:

1. **The tenderer shall attach to this form a letter from the bank at which he declares he conducts his account. The contents of the bank's letter must state the credit rating that it, in addition to the information required below, accords to the tenderer for the business envisaged by this tender. Failure to provide the required letter with the tender submission may render the tenderer's offer unresponsive in terms of tender condition 5.8.**
2. **The tenderer's banking details as they appear below shall be completed.**
3. **In the event that the tenderer is a joint venture enterprise, details of all the members of the joint venture shall be similarly provided and attached to this form.**
4. **The information as supplied will be used to calculate the tenderer's functionality score as per clause 5.11.9 of the tender data.**

The tenderer shall provide the following:

i) Name of Account Holder:.....

ii) Account Number: .....

iii) Bank name:.....

iv) Branch Number:.....

v) Bank and branch contact details .....

.....

SIGNED ON BEHALF OF THE TENDERER: .....

FORM A6: CERTIFICATE OF TENDERER'S LITIGATION HISTORY

Note to tenderer:
The tenderer shall list below details of any litigation with which the tenderer (including its directors, shareholders or other senior members in previous companies) has been involved with any organ of state or state department within the last ten years. The details must include the year, the litigating parties, the subject matter of the dispute, the value of any award or estimated award if the litigation is current and in whose favour the award, if any, was made.

Failure to provide or disclose the following information will render the tenderer's offer non-responsive in terms of tender condition 5.8. Please visit www.saflii.org.za to evaluate your status.

Client	Other litigating party	Dispute	Award value	Date resolved

SIGNED ON BEHALF OF THE TENDERER: .....

FORM A7: SCHEDULE OF CURRENT COMMITMENTS

Notes to tenderer:

1. **The tenderer shall list below all contracts currently under construction or awarded and about to commence and tenders for which offers have been submitted but awards not yet made.**
2. **In the event of a joint venture enterprise, details of all the members of the joint venture shall similarly be attached to this form.**
3. **The lists must be restricted to not more than 20 contracts and 20 tenders. If a tenderer's actual commitments or potential commitments are greater than 20 each, those listed should be in descending order of expected final contract value or sum tendered.**

TABLE 1 CONTRACTS AWARDED				
Client	**Project**	**Expected total value of contract (incl. VAT)**	**Duration (Months)**	**Expected completion date**

SIGNED ON BEHALF OF THE TENDERER: .....

TABLE 2 TENDERS NOT YET AWARDED				
Client	**Project**	**Sum Tendered (incl. VAT)**	**Tendered Duration (Months)**	**Expected commencement date**

SIGNED ON BEHALF OF THE TENDERER: .....

FORM A8: CERTIFICATE OF COMPLIANCE WITH OCCUPATIONALHEALTH AND SAFETY ACT, 1993 AND CONSTRUCTION REGULATIONS, 2014

Note to tenderer:
Discovery that the tenderer has failed to make proper disclosure may result in the Employer terminating a contract that flows from this tender on the ground that it has been rendered invalid by the tenderer's misrepresentation.

The tenderer shall attach to this Form evidence that he is registered and in good standing with a compensation insurer who is approved by Department of Labour in terms of section 80 of the Compensation for Injury and Disease Act (COIDA / COID Act (Act 130 of 1993).

The tenderer is required to disclose, by also attaching documentary evidence to this form, all inspections, investigations and their outcomes conducted by the Department of Labour into the conduct of the tenderer at any time during the 36 months preceding the date of this tender.

SIGNED ON BEHALF OF THE TENDERER: .....

FORM A9: CERTIFICATE OF REGISTRATION WITH CIDB

The tenderer shall provide a printed copy of the Active Contractor's Listing off the CIDB website. (www.cidb.org.za). In the case of a Joint Venture, a printed copy of the Active Contractor's Listing must be provided for each member of the Joint Venture.

Name of Contractor: .....

Contractor Grading Designation: .....

CIDB Contractor Registration Number: .....

SIGNED ON BEHALF OF THE TENDERER: .....

FORM A10: REGISTRATION ON NATIONAL TREASURY CENTRAL SUPPLIERS DATABASE.

The tenderer shall provide a printed copy of the Active Supplier Listing on the National Treasury Central Supplier Database. (www.treasury.gov.za). In the case of a joint venture (JV), the tenderer shall provide printed copies of the Active Supplier Listing on the National Treasury Central Supplier Database for each member of the JV. In the case of a Joint Venture, a printed copy of the Active Supplier Listing must be provided for each member of the Joint Venture.

Name of Contractor:

Central Supplier Database Supplier Number:

Supplier Commodity:

Delivery Location:

SIGNED ON BEHALF OF THE TENDERER: …….

FORM A11: CERTIFIED COPIES OF DIRECTORS / MEMBERS / TRUSTEESIDENTITY DOCUMENTS

The tenderer shall attach to this page **original certified** copies of the directors / members trustee's identity documents of the tendering entity.

In the case of joint ventures, the required documents shall be submitted for each member of the joint venture.

Failure to submit the required documentation in the prescribed format will render the tenderer's offer non-responsive in terms of tender condition 5.8.

SIGNED ON BEHALF OF THE TENDERER: .....

FORM A12: COPIES OF COMPANY REGISTRATION DOCUMENTS

The tenderer shall attach to this page copies of the registration documents of the tendering entity.

Any of the following documents for the tendering entity is sufficient:

CK1: Founding Statement for a Close Corporation.
CK2: Amended founding statement for a Close Corporation.
CM1: Certificate of Incorporation for a company.
CM2: Memorandum of Association for a company.
CM9: Certificate of Change of name for a company.

Trust Deed and Letter of Authority to Act as Trustees certified by the High Court.

In the case of joint ventures, the required documents shall be submitted for each member of the joint venture.

Note:

The tenderer is to ensure that the documentation submitted meets the following criteria:

- The name of the active directors/members appears on the documents.
- The ID documents correspond with the names of active directors/members.

If the above criteria are not met the tenderers offer will be rendered non-responsive in terms of tender condition 5.8.

SIGNED ON BEHALF OF THE TENDERER: .....

FORM B1: CONTRACTOR'S ESTABLISHMENT ON SITE

The combined, extended total tendered for Item A1 to A2 - (The Contractor's general obligations):

a) Schedules for Fixed Charges Items
b) Schedules for Time Related Items
c) Time-related obligations

shall not exceed a maximum of 15% of the tender sum (Excluding Contingencies, Escalation and VAT).

If the 15% maximum allowance are exceeded the tenderer's offer will be rendered non-responsive in terms of tender condition 5.8.

SIGNED ON BEHALF OF TENDERER: .....

FORM C1: PREFERENCING POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATION 2022

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

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

---

1. GENERAL CONDITIONS

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

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

1.2 **To be completed by the organ of state**

(*delete whichever is not applicable for this tender*).

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

b) The applicable preference point system for this tender is the 80/20 preference point system.

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

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

(a) Price; and

(b) Specific Goals.

1.4 **To be completed by the organ of state:**

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80
SPECIFIC GOALS	20
Total points for Price and SPECIFIC GOALS	**100**

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

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

2. DEFINITIONS

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

(b) **"price"** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;

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

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

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

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

3.1.1 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

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

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**

$$Ps = 80\left(1 + \frac{Pt - P\,max}{P\,max}\right) \text{ or } \quad Ps = 90\left(1 + \frac{Pt - P\,max}{Pmax}\right)$$

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 (90/10 system) (To be completed by the organ of state)	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)

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**: ……   ……

SDM:	Witness 1:	Witness 2:	Tenderer:	Witness 1:	Witness 2:

EVALUATION CRITERIA

- A preferential Point system shall apply whereby the points will be allocated in accordance with the Preferential Procurement Regulations of 2022, where 80 points will be allocated in respect of price and 20 points in respect of preference points claimed for attainment of other specific goals summarized as follows: **(80/20 criteria).**

HDI SPECIFIC GOALS	**POINTS**
HDI (blacks, Indians and Coloureds)	12
Woman-Ownership of than 50%	2
Disability ownership of more than 50% (Physically Impaired)	2
Youth	2
Locality	2
Total	**20**

- A preferential Point system shall apply whereby the points will be allocated in accordance with the Preferential Procurement Regulations of 2022, where 90 points will be allocated in respect of price and 10 points in respect of preference points claimed for attainment of other specific goals summarized as follows: **(90/10 criteria).**

HDI SPECIFIC GOALS	**POINTS**
HDI (Black, Indians and Coloureds	6
Woman-Ownership of more than 50%	1
Disability ownership of more than 50%	1
Youth	1
Locality (within SDM jurisdiction)	1
Total	**10**

FORM D1: SCHEDULE OF WORK EXPERIENCE

Note to tenderer:
The tenderer shall enter in the spaces provided below a complete list of the last ten civil-engineering contracts awarded to him. The tenderer shall attach to this form completion certificates OR practical completion certificates for those projects that have reached practical completion within 18 months prior to the advertisement of this tender. This information is deemed to be material to the award of the contract.

EMPLOYER (NAME, TEL NO & FAX NO)	CONSULTING ENGINEER (NAME, TEL NO & FAX NO)	NATURE OF WORK	VALUE OF WORK	YEAR COMPLETED

SIGNED ON BEHALF OF THE TENDERER: .....

FORM D2: SCHEDULE OF CONSTRUCTION EQUIPMENT

Note to tenderer: State with relevant symbol in the availability column.

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

a) CONSTRUCTION EQUIPMENT IMMEDIATELY AVAILABLE (I)
b) CONSTRUCTION EQUIPMENT ON ORDER (O)
(State details of arrangements made, with delivery dates)
c) CONSTRUCTION EQUIPMENT THAT WILL BE ACQUIRED OR HIRED (H)
(State details of delivery arrangements)

DESCRIPTION, SIZE, CAPACITY	NUMBER	AVAILABILITY

SIGNED ON BEHALF OF TENDERER: .....

FORM D3: SCHEDULE OF CONTRACTOR'S KEY PROJECT PERSONNEL

The tenderer shall state below what project personnel will be available for this contract and what additional personnel will be employed for the work should he be awarded the contract.

More than a single individual maybe proposed for a position, based on the size of the project and the required personnel.

No one person may play a role in more than one position in the contract.

Any additional supporting documentation to substantiate the proposed personnel should be attached to this page.

REFER TO SECTION 5.11.9 (PRE-QUALIFICATION CRITERIA) OF THE TENDER DATA FOR THE MINIMUM REQUIRED CONTRACTOR'S PERSONNEL

POSITION	NAME	QUALIFICATIONS (State the Institution, Qualification Obtained and Year Obtained)	NO. YEARS OF RELEVANT EXPERIENCE (Indicate the number of years of road building experience and key expertise)
CONTRACT MANAGER			
SITE AGENT			
SENIOR FOREMAN			
JUNIOR FOREMEN			
SAFETY OFFICER			
OTHER (Specify)			
OTHER (Specify)			
OTHER (Specify)			
OTHER (Specify)			

Please note that the personnel required on this tender shall remain valid for the duration of the project, approval from the department should be sourced for any change in personnel with similar or higher requirements. The requirements should be as stipulated on quality criteria, clause 5.11.9 of tender data.

Contractors shall employ in labour-intensive works only those supervisory and management staff that have completed the required Skills Programme in terms of Appendix G of the "Guidelines for the implementation of labour intensive infrastructure projects under the Expanded Public Works Programme (EPWP) Third Edition 2015":

SIGNED ON BEHALF OF TENDERER: .....

FORM D4: SCHEDULE OF SPECIALIST SUBCONTRACTORS

Note to tenderer:

1. **The tenderer shall list below the specialist items of work on this contract. Alternatives may be mentioned.**
2. **The tenderer shall state whether he intends to carry out any specialised work himself.**

Acceptance of this tender shall not be construed as approval of all or any of the listed specialist subcontractors. Should any or all of the specialist subcontractors not be 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, even in the event of a subcontractor not listed below being approved by the Employer's Agent.

SPECIALISED ITEM	NAME OF SPECIALIST SUBCONTRACTOR

SIGNED ON BEHALF OF TENDERER: .....

FORM D5: INDICATIVE CONSTRUCTION PROGRAMME

Note to tenderer:
If a tenderer wishes to submit an alternative tender then this form, appropriately completed, shall be attached to the Pricing Schedule for the alternative proposal.

The tenderer shall attach a preliminary programme, reflecting the proposed sequence and tempo of execution of the various activities comprising the work for this contract. The programme shall be in accordance with the information provided in form D2: Schedule of construction equipment, form D6: Schedule of estimated monthly expenditure, and with all other aspects of the tender.

SIGNED ON BEHALF OF TENDERER: .....

FORM D6: SCHEDULE OF ESTIMATED MONTHLY EXPENDITURE

Note to tenderer:
If a tenderer wishes to submit an alternative tender then this form, appropriately completed, shall be attached to the Pricing Schedule for the alternative proposal.

The tenderer shall state his estimated value of the work to be completed every month, based on his preliminary programme and his tendered unit rates, in the tables below.

MONTH	VALUE	MONTH	VALUE
1	R	TOTAL b/f	R .....
2	R	11	R .....
3	R	12	R .....
4	R	13	R .....
5	R	14	R .....
6	R	15	R .....
7	R	16	R .....
8	R	17	R .....
9	R	18	R .....
10	R	19(FINAL, *stipulate as per your contract duration*)*	R .....
TOTAL c/f	R		
		TOTAL: R	

* Final payment at end of Defects Liability Period is for balance of retention and any other payments due.

SIGNED ON BEHALF OF TENDERER: .....

FORM D7: SWORN AFFIDAVIT

The tenderer shall attach to this Form a sworn affidavit by the Commissioner of Oath in which he declares that the information provided in Forms D1, D2 and D3 is true.

FORM E1: QUALITY ASSURANCE

The tenderer shall attach to this Form sufficient details from his Quality Assurance Plan to indicate the processes and policies to be adopted to ensure that the required specifications of the works are achieved during construction.

The Quality Assurance Plan to be submitted to the Employer's Agent after award shall include that of any subcontractors (if applicable).

The minimum details to be given with this tender shall include (where applicable):

1. TESTING (WHICH TESTS, POINT/S OF TESTING, FREQUENCY)
2. MANUFACTURE, TRANSPORT, CONSTRUCTION
3. PERSONNEL EMPLOYED ON ALL ACTIVITIES AND QUALITY CONTROL
4. ANY OTHER MATTERS WHICH RELATE TO THE QUALITY ASSURANCE PLAN WHICH THE TENDERER CONSIDERS MAY BE IF ASSISTANCE IN TENDER ADJUDICATION

SIGNED ON BEHALF OF TENDERER: .....

FORM E2: DECLARATION OF INTEREST MBD 4

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

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

3 IN ORDER TO GIVE EFFECT TO THE ABOVE, THE FOLLOWING QUESTIONNAIRE MUST BE COMPLETED AND SUBMITTED WITH THE BID.

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

3.2 Identity Number: …….

3.3 Position occupied in the Company (director, trustee, hareholder[2]):……..

3.4 Company Registration Number: …….

3.5 Tax Reference Number:……

3.6 VAT Registration Number: ……

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

3.8 Are you presently in the service of the state? **YES / NO**

3.8.1 If yes, furnish particulars. ……

……..

[1]MSCM Regulations: "in the service of the state" means to be –

(a) a member of –
   (i) any municipal council;
   (ii) any provincial legislature; or
   (iii) the national Assembly or the national Council of provinces;

(b) a member of the board of directors of any municipal entity;
(c) an official of any municipality or municipal entity;
(d) an employee of any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999);
(e) a member of the accounting authority of any national or provincial public entity; or
(f) an employee of Parliament or a provincial legislature.

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

3.9 Have you been in the service of the state for the past twelve months? ……**YES / NO**

3.9.1 If yes, furnish particulars.……..…….

…….

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid?.....**YES / NO**

3.10.1 If yes, furnish particulars.

……

……

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

3.11.1 If yes, furnish particulars

……

…….....

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

3.12.1 If yes, furnish particulars.

……

……

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

3.13.1 If yes, furnish particulars.

……

……

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

3.14.1 If yes, furnish particulars:

……..

……..

2

SDM:	Witness 1:	Witness 2:	Tenderer:	Witness 1:	Witness 2:

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

Full Name	Identity Number	State Employee Number

…….
SIGNATURE

…….
DATE

…….
Capacity

…….
Name of Bidder

FORM E3: DECLARATION FOR PROCUREMENT MBD 5

DECLARATION FOR PROCUREMENT ABOVE R10 MILLION (ALL APPLICABLE TAXES INCLUDED)

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

1 Are you by law required to prepare annual financial statements for auditing?

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

……

……

***YES/NO**

2 Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days?

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

2.2 If yes, provide particulars.

……

……

……

……..

* Delete if not applicable

***YES / NO**

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

1.1 If yes, furnish particulars

……

……

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

4.1 If yes, furnish particulars

……..

……..

CERTIFICATION

I, THE UNDERSIGNED (NAME) ……

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS CORRECT.

I ACCEPT THAT THE STATE MAY ACT AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

……..

Signature

……..

Date

…….....

Position

……

Name of Bidder

FORM F1: CONTRACT FORM – RENDERING OF SERVICES

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SERVICE PROVIDER (PART 1) AND THE PURCHASER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SERVICE PROVIDER AND THE PURCHASER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE SERVICE PROVIDER)

1. I hereby undertake to render services described in the attached bidding documents to **Sekhukhune District Municipality** in accordance with the requirements and task directives / proposals specifications stipulated in Bid Number **SK8/3/1-22/2024/25** at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the Purchaser during the validity period indicated and calculated from the closing date of the bid.

2. The following documents shall be deemed to form and be read and construed as part of this agreement:

(i) Bidding documents, *viz*
- Invitation to bid;
- Tax clearance certificate;
- Pricing schedule(s);
- Filled in task directive/proposal;
- Preference claims for Broad Based Black Economic Empowerment Status Level of Contribution in terms of the Preferential Procurement Regulations 2017;
- Declaration of interest;
- Declaration of bidder's past SCM practices;
- Certificate of Independent Bid Determination;
- Special Conditions of Contract;

(ii) General Conditions of Contract
(iii) Bill of Quantities
(iv) Project Specifications
(v) Particular Specifications
(vi) Drawings
(vii) Occupational Health and Safety (OHS) Specifications and Annexures
(viii) Geotechnical report
(ix) Environmental Management Programme (EMPr) and the full Environmental Authorisation (EA) document (Ref. No. NWP/EIA/45/2018) (signed on 14/01/2019) or latest approved document
(x) Other (specify)

3. I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) and rate(s) quoted cover all the services specified in the bidding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.

4. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfillment of this contract.

5. I declare that I have no participation in any collusive practices with any bidder or any other person regarding this or any other bid.

6. I confirm that I am duly authorised to sign this contract.

NAME (PRINT) …….

CAPACITY …….

SIGNATURE …….

NAME OF FIRM …….

DATE …….

WITNESSES

1 ……..…….

2 ……..…….

DATE: ……..

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I……. in my capacity

   as……..…….

   accept your bid under reference number **……** dated……for the rendering of services indicated hereunder and/or further specified in the annexure(s).

2. An official order indicating service delivery instructions is forthcoming.

3. I undertake to make payment for the services rendered in accordance with the terms and conditions of the contract, within 30 (thirty) days after receipt of an invoice.

DESCRIPTION OF SERVICE	PRICE (ALL APPLICABLE TAXES INCLUDED)	COMPLETION DATE	THE SPECIFIC GOAL TARGETS CONTRIBUTION	MINIMUM THRESHOLD FOR LOCAL PRODUCTION AND CONTENT (if applicable)

4. I confirm that I am duly authorized to sign this contract.

SIGNED AT ……ON……..

NAME (PRINT) …….

SIGNATURE …….

OFFICIAL STAMP

WITNESSES

1 …..…….

2 …..…….

DATE: ……..

FORM F2: DECLARATION OF BIDDERS PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1 This Standard Bidding Document must form part of all bids invited.

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

3 The bid of any bidder may be disregarded if that bidder, or any of its directors have-

a. abused the institution's supply chain management system;
b. committed fraud or any other improper conduct in relation to such system; or
c. failed to perform on any previous contract.

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

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the *audi alteram partem* rule was applied). **The Database of Restricted Suppliers now resides on the National Treasury's website(www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? **The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.2.1	If so, furnish particulars:		

Item	Question	Yes	No
4.3	Was the bidder or any of its directors convicted by a court of law (including a court outside of the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐
4.3.1	If so, furnish particulars:		
4.4	Was any contract between the bidder and any organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME) ..... CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS TRUE AND CORRECT.

I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT, ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

Signature ..... Date .....

Position..... Name of Bidder .....

FORM F3: CERTIFICATE OF INDEPENDENT BID DETERMINATION

1 This Standard Bidding Document (SBD) must form part of all bids[1] invited.

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

3 Treasury Regulation 16A9 prescribes that accounting officers and accounting authorities must take all reasonable steps to prevent abuse of the supply chain management system and authorizes accounting officers and accounting authorities to:

a. disregard the bid of any bidder if that bidder, or any of its directors have abused the institution's supply chain management system and or committed fraud or any other improper conduct in relation to such system.

b. cancel a contract awarded to a supplier of goods and services if the supplier committed any corrupt or fraudulent act during the bidding process or the execution of that contract.

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

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

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

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

FORM F4: CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

(Bid Number and Description)

in response to the invitation for the bid made by:

Sekhukhune District Municipality

(Name of Institution)

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

I certify, on behalf of_____that:
(Name of Bidder)

1. I have read, and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
   (a) has been requested to submit a bid in response to this bid invitation;
   (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
   (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium[3] will not be construed as collusive bidding.
7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
   (a) prices;
   (b) geographical area where product or service will be rendered (market allocation);
   (c) methods, factors or formulas used to calculate prices;
   (d) the intention or decision to submit or not to submit, a bid;
   (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
   (f) bidding with the intention not to win the bid.

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

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

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

Signature ..... Date .....

Position ..... Name of Bidder .....

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

FORM F5: CERTIFICATE OF TENDER COMPLIANCE

1.SUB-CONTRACTING
1.1 Will any portion of the contract be sub-contracted? (Tick applicable box)

YES		NO	

1.1.1 If yes, indicate:

i) What percentage of the contract will be contracted……..%

ii) The name of the sub-contractor ……

iii) Whether the sub-contractor is an EME or QSE

(Tick applicable box)

YES		NO	

iv) Specify, by ticking the appropriate box, if subcontracting with an enterprise in terms of Preferential Procurement Regulations, 2022:

2. DECLARATION WITH REGARD TO COMPANY/FIRM
2.1 Name company/firm:……

2.2 VAT registration number:…….

2.3 Company registration number…….

8.4 TYPE OF COMPANY / FIRM
 Partnership/ Joint Venture / Consortium
 One person business/sole propriety
 Close corporation
 Company
 (Pty) Limited
[Tick applicable box]

1.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

……
……
……
…….

1.6 COMPANY CLASSIFICATION
 Manufacturer

 Supplier

 Professional service provider

 Other services provider e.g. transporter, etc
[Tick applicable box]

1.7 MUNICIPAL INFORMATION

Municipality where the business is situated:…….

Registered Account Number:…….

Stand Number:…….

1.8 Total number of years the company/ firm has been in business:……

1.9 I/we, the undersigned, who is/are duly authorized to do so on behalf of the company/firm, certify that the points claimed, based on the specific goal we 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 inn paragraphs 1.4 and 1.6, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

iv) If the specific goal has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not fulfilled, the purchaser may, in addition to any other remedy it may have-

a) Disqualify the person from the bidding 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 makes less favorable arrangements due to such cancellation;

d) Recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period of not exceeding 10 years, after the audit alteram partem (hear the other side) rule has been applied; and

e) Forward the matter for criminal prosecution.

WITNESSES	
1…….	……
2…….	SIGNATURE OF BIDDER
	DATE:……. …..
	ADDRESS:……
	…….

PART 2: THE CONTRACT

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PART C1 AGREEMENT AND CONTRACT DATA

TENDER No: SK8/3/1-22/2024/25 **CIDB Category 7 CE or higher**

FOR

PROJECT NAME: CONSTRUCTION OF MOUTSE EAST AND WEST WATER RETICULATION PHASE 2: ELOKHISHINI, PHOOKO AND PHOOKWANE - CONTRACT 2D

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C1.1 Form of Offer and Acceptance

This document formalises the legal process of offer and acceptance. It contains:

a) **the offer to provide the engineering and construction works for a price, or in accordance with the terms of the financial proposal made;**
b) **confirmation from the Employer that he accepts the tender offer following his tender evaluation, and that a contract therefore exists; and**
c) **a schedule of deviations, which records any, agreed changes to the documentation that may occur during the process of offer and acceptance.**

Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of: Contract No: **SK8/3/1-22/2024/25 – CONSTRUCTION OF MOUTSE EAST AND WEST WATER RETICULATION PHASE 2: ELOKHISHINI, PHOOKO AND PHOOKWANE – CONTRACT 2D**

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

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

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS:

.....

..... Rand (in words); R .....(in figures)

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

Signature(s).....

Name(s).....

Capacity.....

for the tenderer .....
(Name and address of organization)

Name &signature of witness .....

..... Date .....

CIDB Registration Number .....

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 C.1	Agreements and Contract Data, (which includes this agreement)
Part C.2	Pricing data
Part C.3	Scope of work.
Part C.4	Site information
Part C.5	Annexures

and drawings and documents or parts thereof, which may be incorporated by reference into Parts 1 to 5 above.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto as 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 at, 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.

Signature(s).....

Name(s).....

Capacity.....

for the Employer .....

(Name and address of organization)

Name & signature of witness

..... Date .....

SDM:	Witness 1:	Witness 2:	Tenderer:	Witness 1:	Witness 2:

Schedule of Deviations

Notes:

1. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
2. A Tenderer's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as foresaid 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 _____

7 **Subject**_____

Details _____

By the duly authorised representatives signing this agreement, the Employer and the Tenderer agree to and accept the foregoing Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and addenda thereto as listed in the 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.

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

SDM:	Witness 1:	Witness 2:	Tenderer:	Witness 1:	Witness 2:

FOR THE TENDERER:

Signature(s) ....

Name(s) ....

Capacity ....

.....

[Name and address of organisation]

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

FOR THE EMPLOYER:

Signature(s) ....

Name(s) ....

Capacity ....

.....

[Name and address of organisation]

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

CONFIRMATION OF RECEIPT

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

The..... *[day]*

of ..... *[month]*

20 .....*[year]*

at ..... *[place]*

For the Contractor: .....
Signature

.....
Name

.....
Capacity

Signature and name of witness: .....
Signature

.....
Name

C1.1.2 Form Agreement in terms of the Mine Health and Safety Act, (Act No. 29 of 1996) as amended by the Mine Health and Safety Amendment Act (Act No. 72 of 1997) and the Mineral Resources and Petroleum Development Act (Act No. 28 of 2002)

THIS AGREEMENT made at …….…….…… on this the …… day of …….. in the year …….

between the **SEKHUKHUNE DISTRICT MUNICIPALITY** (hereinafter) called "the Employer" of the one part, herein represented by ……. in his capacity as …….. and delegate of the Employer in terms of the Employer's standard powers of delegation pursuant to the provisions of Act No. 7 of 1998 and ……..... in his capacity as the Contractor and being duly authorised by virtue of a resolution appended hereto as **ANNEXURE A**.

WHEREAS the Employer is desirous that certain works be constructed, as stated above and has accepted a tender by the Contractor for the construction, completion and maintenance of such works and whereas the Employer and the Contractor have agreed to certain arrangements and procedures to be followed in order to ensure compliance by the Contractor with the provisions of the Mine Health and Safety Act (Act No.29 of 1996); as amended by the Mine Health and Safety Amendment Act (Act No. 27 of 1997), the Mineral Resources and Petroleum Development Act (Act No. 28 of 2002) and all the applicable Regulations of the said Acts.

NOW THEREFORE THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. The Contractor declares himself conversant with all the requirements, regulations and standards of the said Acts and Amendments of the Acts, as well as with the procedures and safety rules of the Employer as pertaining to the Contractor and all his Sub-contractors.

2. The Contractor accepts responsibility for compliance with all the requirements, regulations and standards of the Acts and Amendments of the Acts, as well as with the procedures and safety rules of the Employer as pertaining to the Contractor and all his Sub-contractors.

3. The Contractor, as the appointed Mine Manager of the Employer (Owner of the mine / borrow pit / quarry), shall undertake all the duties and accept all the responsibilities of the owner in compliance with the said Acts, Amendments and its Regulations.

4. The Contractor, as the appointed Mine Manager of the Owner, shall in turn appoint a Sub-Ordinate Mine Manager, a Responsible Mine Surveyor/Competent Person and a Competent Person in Charge of Machinery who shall undertake the duties as delegated to them in terms of their appointments.

5. The Contractor shall himself obtain the necessary authorisation for mining, quarrying, blasting and crushing for all the borrow pit sites.

6. The Contractor shall assume responsibility for the Environmental Management Programme (EMP) in respect of all the borrow pit sites and quarries (mines) and shall ensure that the sites are rehabilitated at the conclusion of the contract.

7. The Contractor shall comply with all the provisions and requirements as set out in the EMP and in the said Acts, Amendments and its Regulations.

8. This Agreements shall hold good from the date of signature until the date on which a Closure Certificate is issued by the Mining Authority (Department of Minerals and Energy).

In witness thereof, the parties have set their signature hereon in the presence of the subscribing witnesses:

SIGNED ON BEHALF OF THE EMPLOYER .....

AS WITNESS:

SIGNATURE: .....

NAME(PRINT): .....

SIGNED ON BEHALF OF THE CONTRACTOR .....

AS WITNESS:

SIGNATURE: .....

NAME(PRINT): .....

C1.1.3 Appointment in Terms of Section 3(1) of the Mine Health and Safety Act (Act No. 29 of 1996) as amended by the Mine Health and Safety Amendment Act (Act No. 72 of 1997)

I, ... in my capacity as....., having been appointed, in terms of **Section 4(1)** of the Act (as amended), by the ....of the **SEKHUKHUNE DISTRICT MUNICIPALITY**, who is the owner of the Mine(s) to be worked under the requirements of the abovementioned Acts, hereby, in terms of **Section 3(1)** of the Act (as amended), appoint ...
in his capacity as ....of the Contractor, ...of address: .....and contact number: .....to perform all the functions entrusted to the Employer by **Sections 2 and 3** of the Act (as amended) for all the borrow pits on Contract No: ……(project number and project description)

SIGNED: .....

DATE: .....

WITNESS: 1..... 2. .....

NAME(Print): 1..... 2. .....

I, ..., having been appointed in terms of Section 3(1) of the Act (as amended) to perform all functions entrusted to the Employer by Sections 2 and 3 of the Act (as amended) hereby accept the above appointment.

SIGNED: .....

DATE: .....

WITNESS: 1..... 2. .....

NAME(Print): 1..... 2. .....

C1.1.4 Agreement in Terms of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)

THIS AGREEMENT made at ..... on this the .....day of ..... in the year. between S(hereinafter called "the Employer") on the one part, herein

represented by ..... in his capacity as ..... and delegate of the Employer and .....

(hereinafter called "the Principal Contractor") of the other part, herein represented by .....

..... in his capacity as .....

WHEREAS the Employer is desirous that certain works be constructed, (insert project description) viz and has accepted a tender by the Principal Contractor for the construction, completion and maintenance of such works and whereas the Employer and the Principal Contractor have agreed to certain arrangements and procedures to be followed in order to ensure compliance by the Principal Contractor with the provisions of the Occupational Health and Safety Act 1993 (Act 85 of 1993 and the Construction Regulation, February 2014);

NOW THEREFORE THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. The Principal Contractor shall execute the work in accordance with the contract documents pertaining to this contract.

2. This Agreement shall hold good from its commencement date, which shall be the date of a written notice from the Employer or Employer's Agent requiring him to commence the execution of the Works, to either:

   a) the date of the final certificate issued in terms of the relevant clauses of the General Conditions of Contract (hereinafter referred to as "the GCC"), as contained in the contract documents pertaining to this contract, or

   b) the date of termination of the contract.

3. The Principal Contractor declares himself to be conversant with the following: -

   a) All the requirements, regulations and standards of the Occupational Health and Safety Act (Act 85 of 1993), hereinafter referred to as "The Act", together with its amendments and with special reference to the following Sections of The Act.

      i) Section 8: General duties of employers to their employees.

      ii) Section 9: General duties of employers and self-employed persons to persons other than employees.

      iii) Section 37: Acts or omissions by employees or mandatories and

      iv) Sub-section 37(2) relating to the purpose and meaning of this Agreement.

      v) Construction Regulations 2014, and other safety regulations, as applicable.

   b) The procedures and safety rules of the Employer as pertaining to the Principal Contractor and to all his sub-contractors.

4. The Principal Contractor is responsible for the compliance with the Act by all his sub-contractors, whether or not selected and/or approved by the Employer.

5. The Principal Contractor warrants that all his and his sub-contractors' employees are covered in terms of the Compensation for Occupational Injuries and Diseases Act 1993 which cover shall remain in force whilst any such employees are present on site. A letter of good standing from the Compensation Commissioner to this effect must be produced to the Employer upon signature of the agreement.

6. The Principal Contractor undertakes to ensure that he and/or his sub-contractors and/or their respective employees will at all times comply with the following conditions:

   a) The Principal Contractor shall assume the responsibility in terms of Section 16.1 of the Occupational Health and Safety Act. The Principal Contractor shall not delegate any duty in terms of Section 16.2 of this Act without the prior written approval of the Employer. If the Principal Contractor obtains such approval and delegates any duty in terms of section 16.2 a copy of such written delegation shall immediately be forwarded to the Employer.

   b) All incidents referred to in the Occupational Health and Safety Act shall be reported by the Principal Contractor to the Department of Labour as well as to the Employer. The Employer will further be provided with copies of all written documentation relating to any incident.

   c) The Employer hereby obtains an interest in the issue of any formal enquiry conducted in terms of section 32 of the Occupational Health and Safety Act into any incident involving the Principal Contractor and/or his employees and/or his sub-contractors.

In witness thereof the parties hereto have set their signatures hereon in the presence of the subscribing witnesses:

SIGNED FOR AND ON BEHALF OF THE EMPLOYER:.....

WITNESS:

1. ..... 2. .....
NAME (Print) NAME (Print)

SIGNED FOR AND ON BEHALF OF THE PRINCIPAL CONTRACTOR: .....

WITNESS:

1. ..... 2. .....
NAME (Print) NAME (Print)

C1.2 Contract Data

This document identifies which standard conditions of contract are applicable, and together with contract specific data, establishes the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the contract.

CONTRACT DATA FOR INTERNAL WATER RETICULATION OF MOUTSE EAST AND WEST PHASE 2: ELOKHISHINI, PHOOKO AND PHOOKWANE - CONTRACT 2D

PART 1: DATA PROVIDED BY THE EMPLOYER

CONDITIONS OF CONTRACT

The *General Conditions of Contract for Construction Works,* Third Edition, 3nd print 2015, published by the South African Institution of Civil Engineering, is applicable to this Contract and is obtainable from www.saice.org.za.

Copies of these Conditions of Contract may be obtained from the South African Institution of Civil Engineering, Tel 011 805 5947.

The contractor shall achieve in the performance of the contract the Contract Skills Development Goal (CSDG) established in the cidb Standard for Developing Skills through Infrastructure Contracts, published in Gazette Notice No.48491 of 28 April 2023.

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

CONTRACT SPECIFIC DATA

The following contract specific data are applicable to this Contract:

Clause

1.1 Definitions

1.1.1.4 "Practical Completion" add the following:- shall mean the state of readiness of the entire works as indicated in the "Scope of Works".

1.1.1.5 *Delete the clause and replace with the following*.

"Commencement Date" means the date that the Agreement, made in terms of the Form of Offer and Acceptance, comes into effect,

The contract shall come into effect when the Employer issues a letter to the Contractor stating that his tender has been accepted / the contract has been awarded to the Contractor, or upon receipt of the signed contract document by the Contractor from the Employer.

"Commencement Date" add the following:- the "Commencement Date" shall be 21 calendar days after the date reflected on the "Letter of Acceptance" indicating the acceptance of the tender by the Client.

1.1.1.13 The Defects Liability Period is 365 days.

1.1.1.14 The time for achieving Practical Completion is 324 days, comprising of the Construction Period, approximately 3 weeks builders break and public holidays and 21 days Mobilisation Period. *(on the schedule, you only allow for 43 weeks, we do not pay for mobilisation period)*

1.1.1.15 The name of the Employer is Sekhukhune District Municipality

1.1.1.16 The Engineer is Rendeals Four Consulting, also referred to in the contract as

"Rendeals", "Rendeals Four", "R4C" and "Rendeals 4"

1.1.1.26 The Pricing Strategy is a re-measurement Contract

1.1.1.35 **'Mobilisation Period'** means the period as stated in the Contract Data, or the period between the Commencement Date and the date that the Contractor starts with the construction of the Works (Commencement of the Works Clause 5.3.3), whichever is the shortest.

Mobilisation Period: - 21 days

1.1.1.36 **'Construction Period'** means the number of days as specified in the Contract Data, within which the Contractor has to complete the construction of the Works as detailed in Part C3."

Construction Period: 324 days.

1.2.1.2 The Employer's address for receipt of communications is:

Physical address:	Postal address:
18 Chris Wiid Street	Private Bag X 8611
Grobersdal	Grobersdal
0470	0470

Telephone: + 27 (13) 262 7300
Website: www.sekhukhunedistrict.gov.za

1.1.1.16 The name of the Employer's Agent is (consultants name) represented by an employee duly authorised thereto in writing.

1.2.1.2 The Employer's Agent 's address for receipt of communications is:

Physical address:	Postal address:
Plot 46, Tweefontein	Postnet Suite 73
Polokwane	Polokwane North
0700	0750

Rendeals Four Consulting
Telephone: 015 297 1300
Email: info@rendeals4.co.za.

1.1.1.26 The Pricing Strategy is: Re-measurement Contract.

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

- Clause 5.12: Extension of Time for Practical Completion
- Clause 6.3: Variations
- Clause 6.6.3: Expenditure of Contingency Allowance
- Clause 10.1.5: The Employer's Agent shall rule on any claim lodged by the Contractor, but the final approval shall be upon written approval from

the Employer in accordance with the standard documentation of processing claims.

5.1.1 and 5.8.1 The non-working days are Sundays.

The special non-working days are:

1 Public holidays
2 The year end break commencing and ending on dates as specified by SAFCEC.

5.3.1 The documentation required before commencement with Works execution are:

Health and Safety Plan (Refer to Clause 4.3)
Initial programme (Refer to Clause 5.6)
Security (Refer to Clause 6.2)
Insurance (Refer to Clause 8.6)
Quality Assurance as per form E1

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

5.3.3 Time to instruct commencement of the Works

Replace the entire amended Clause 5.3.3 with:

"If the Employer's Agent's instruction to commence carrying out the Works, or to resubmit documentation, is not received by the Contractor within 7 days from the actual date of submission of the documentation referred to in Clause 5.3.1, commencement of the Works shall be taken."

5.3.3.1 In respect of works not requiring a construction work permit to be on the expiry of such 7 days.

5.3.3.2 In respect of works requiring a construction work permit to be on the expiry of the 63 days (2 months) Mobilisation Period, unless otherwise instructed."

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

5.4.3 Add the following paragraph after the first paragraph:

"If the Employer is prevented from giving possession of the site to the Contractor due to any epidemic or pandemic incident or regulation which will result in the Mobilisation period exceeding the period stated in Clause 1.1.1.35 then the Mobilisation period will be extended by such a period until which the Employer can give the Contractor access to the site."

5.13.1 The penalty for failing to complete the Works or any portion thereof within the abovementioned time limit, plus approved extensions of time or condonation thereof is 1/30 of a 0.273% of the contract sum (excluding VAT) per calendar day.

5.14.1 Practical Completion

Replace the last sentence of the second paragraph:

"Should the Employer's Agent … on expiry of 14 days."

with the following:

"Should the Employer's Agent not issue such a list within 14 days, Practical Completion shall be deemed to have been achieved on the said fourteenth day."

5.14.2 Issue of Certificate of Practical Completion

Replace "the Employer's Agent"*in the second and third lines with the following:*

", the Contractor shall notify the Employer's Agent, who shall inspect the Works and the Employer's Agent"

5.14.4 Certificate of Completion

Replace "the Employer's Agent"*in the third line of the first paragraph with:*

", the Contractor shall notify the Employer's Agent, who shall inspect the works and the Employer's Agent"

5.16.3 The latent defect period is ten (10) years for civil engineering works.

6.8.2 Contract Price Adjustment: Is NOT applicable

The value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule included in the General Conditions of Contract.

The value of "x" is 0.15.

The values of the coefficients are: (project specific)

a = 0.15 Labour
b = 0.20 Construction equipment
c = 0.55 Material
d = 0.10 Fuel

`

(a) 'L' is the 'Labour Index' and shall be the price index for 'Consumer Price Index' for the Limpopo Province (Groblersdal) as published in the Statistical News Release, P0141, Table A "Consumer Price Index: Main indices"" of Statistics South Africa.

(b) 'P' is the 'Construction Equipment' and shall be the Producer Price Index applicable to Plant and Equipment (Total) as published in the Statistical Release P0151.1, Table 4 of Statistics South Africa.

(c) 'M' is the 'Materials Index' and shall be the Producer Price Index applicable to Civil Engineering Material (Total) as published in the Statistical Release P0151.1, Table 6 of Statistics South Africa.

(d) 'F' is the 'Fuel Index' and shall be the Producer Price Index for Final manufactured goods - Coal and Petroleum Products - Diesel as published in the Statistical News Release P0142.1, Table 1 of Statistics South Africa."

The base month is November 2024. (a month before the closing of advert)

6.8.3 Price adjustments for variations in the cost of special materials are allowed.

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

The percentage advance on Plant not yet supplied to Site is 80%.

6.10.3 Percentage retention is 10%.

The limit of retention money is 10% of the Contract Sum.

6.10.4 Delivery, dissatisfaction with and payment of payment certificate

Replace "28 days *"in the seventh line with* "30 days".

6.10.5 Payment of retention money

Add after the first sentence:

"Half of the retention money shall only be released once the Contractor has rehabilitated all the borrow pits utilised for the project, and the Department of Mineral Resources has issued a letter in which they indicate that they are satisfied with the rehabilitation of the borrow pits."

6.11 Variations exceeding 15 per cent

Replace "15 per cent *"in the heading, the marginal heading and in the third line after 6.11.1.3 with* "20 per cent".

8.6.1.1.2 The value of Plant and materials supplied by the Employer to be included in the insurance sum is Nil.

8.6.1.1.3 The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is Nil.

8.6.1.3 The limit of indemnity for liability insurance is R20 000 000 for any single claim, the number of claims to be unlimited during construction and Defects Liability Period.

10.1.5 Employer's Agent's ruling on Contractor's Claim

Add the following to Clause 10.1.5 before the last sentence:

"If the Employer's Agent does not respond in accordance with the foregoing procedure and timetable, either Party may assume that the claim has been rejected by the Employer's Agent and submit the dispute by issuing a Dispute Notice in terms of Clause 10.3.1."

10.3.1 Dispute Notice

Replace Clause 10.3.1.1 with the following:

10.3.1.1 The dispute arises from any ruling."

10.5.3 The number of Adjudication Board Members to be appointed is three (3).

PART 2: DATA PROVIDED BY THE CONTRACTOR

Clause

1.1.1.9 The Contractor is .....

1.2.1.2 The Contractor's address for receipt of communications is:

Physical address: Postal address:

....

....

....

....

Telephone: .....

Fax:

E-mail: .....

Clause

6.2.1 The security to be provided by the Contractor shall be:

Performance guarantee of 10% of the Contract Sum plus retention of 10% of the value of the Works.

6.5.1.2.3 The percentage allowance to cover overhead charges is …….%.

6.8.3 The variation in cost of special materials is: as per Form B2

C1.3 Form of Guarantee

PRO FORMA

PERFORMANCE GUARANTEE

For use with the General Conditions of Contract for Construction Works, Third Edition, 2nd print, 2015.

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means	:	.....
Physical address	:	.....
"Employer" means	:	.....
"Contractor" means	:	.....
"Employer's Agent" means	:	.....
"Works" means	:	.....
"Site" means	:	.....
"Contract" means	:	The Agreement made in terms of the Form of Offer and Accepted and such amendments or additions to the Contract as may be agreed in writing between the parties.
"Contract Sum" means	:	The accepted amount inclusive of tax of R .....
Amount in words	:	.....
"Guaranteed Sum" means	:	The maximum aggregate amount of R.....
Amount in words	:	.....
"Expiry Date" means	:	..... (Give date) or any other later date set by the Contractor and/or Employer provided such instruction is received prior to the Expiry Date as indicated here.

CONTRACT DETAILS

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

PERFORMANCE GUARANTEE

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

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

3. The Guarantor hereby acknowledges that:

3.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;

3.2 its obligation under this Performance Guarantee is restricted to the payment of money.

4. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:

4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum Certified by the Employer's Agent in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;

4.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;

4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 4.

5. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the Full outstanding balance upon receipts of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:

5.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or

5.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the performance Guarantee is called up in terms of 5; and

5.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.

6. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in term 1.

7. Where the Guarantor has made payment in term 5, the Employer shall upon the date of issue of the final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.

8. Payment by the Guarantor in terms of 4 or 5 shall be made within seven (7) calendar days upon receipt of the first written demand to the Employer.

9. Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.

10. The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.

11. The Guarantor chooses the physical address as stated above for the services of all notices for all purposes in connection herewith.

12. This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor after it has expired.

13. This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.

14. Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's court.

Signed at.....

Date .....

Guarantor's signatory (1).....

Capacity.....

Guarantor's signatory (2).....

Capacity.....

Witness signatory (1).....

Witness signatory (2).....

C1.4 CIDB Adjudicator's Appointment

This document provides the basis by which the parties to contract may appoint an adjudicator

CIDB Adjudicator's Appointment

(For use with the GCC 2015 contract)

This agreement is made on the ..... Day of .....Between:

..... (Name of company / organisation)

Of .....

..... (Address) and

..... (Name of company / organisation)

Of .....

..... (Address)

(The Parties) and .....(Name of adjudicator)

Of .....

..... (address)
(the Adjudicator).

Disputes or differences may arise/have arisen* between the Parties under a Contract dated .....

and known as.....

and these disputes or differences shall be/have been* referred to adjudication in accordance with the CIDB Adjudication Procedure, (hereinafter called "the Procedure") and the Adjudicator may be or has been requested to act.

*Delete as necessary

IT IS NOW AGREED as follows:

The rights and obligations of the Adjudicator and the Parties shall be as set out in the Procedure.

The Adjudicator hereby accepts the appointment and agrees to conduct the adjudication in accordance with the Procedure.

The Parties bind themselves jointly and severally to pay the Adjudicator's fees and expenses in accordance with the Procedure as set out in the Contract Data.

The Parties and the Adjudicator shall at all times maintain the confidentiality of the adjudication and shall endeavour to ensure that anyone acting on their behalf or through them will do likewise, save with the consent of the other Parties which consent shall not be unreasonably refused.

The Adjudicator shall inform the Parties if he intends to destroy the documents, which have been sent to him in relation to the adjudication, and he shall retain documents for a further period at the request of either Party.

SIGNED by:	SIGNED by:	SIGNED by: .....
Name:	Name:	Name:.....
who warrants that he / she is duly authorised to sign for and on behalf of the first Party in the presence of	who warrants that he / she is duly authorised to sign for and behalf of the second Party in the presence of	the Adjudicator in the presence of
Witness:	Witness:	Witness: .....
Name:	Name:	Name:.....
Address:	Address:	Address:
.....	.....	.....
.....	.....	.....
.....	.....	.....
Date:	Date:	Date:.....

PART C2 PRICING DATA

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C2.1 Pricing Instructions

PREAMBLE TO THE SCHEDULE OF QUANTITIES

1. **For the purposes of this schedule of quantities, the following words shall have the meanings hereby assigned to them:-**

Unit	:	The unit of measurement for each item of work as defined in the specifications.
Quantity	:	The number of units of work for each item.
Rate	:	The payment per unit of measurement at which the tenderer tenders to do the work.
Amount	:	The product of the quantity and the rate tendered for an item.
Sum	:	An amount tendered for an item, the extent of which is described in the schedule of quantities, the specifications or elsewhere but the quantity of work of which it not measured in any units.

2. This schedule of quantities forms an integral part of the contract documents.

3. **The quantities set out in the schedule of quantities are approximate quantities only. The quantities of work finally accepted and certified for payment, and not the quantities given in the schedule of quantities, shall be sued for determining payments to the Contractor.**

   The validity of the contract shall in no way be affected by differences between the quantities in the schedule of quantities and the quantities finally certified for payment. Work shall be valued at the rates or sums tendered, subject only to the provisions of the general conditions of contract, paragraphs 11 and 12 of this preamble, and the standard specifications.

4. Rates and sums shall be comprehensive in accordance with the standard specifications. Full compensation for completing and maintaining, during the maintenance period, all the work shown on the drawings and specified in the specifications, and for all the risks, obligations and responsibilities specified in the general conditions of contract, special conditions of contract and specifications shall be considered as provided for collectively in the terms of payment given in the schedule of quantities, except in so far as the quantities given in the schedule of quantities are only approximate.

5. The tenderer shall fill in a rate or sum for each item where provision has been made for it, even where no quantities are given. Items against which no rate or sum has been entered in the tender will not be paid for when the work is executed, as it is assumed that the Contractor does not wish to receive payment for any such work.

   The tenderer shall fill in a rate against all items where the words “rate only” appear in the amount column. The provisions of the standard specifications shall apply in rate-only items. Tenderers shall also note the provisions of paragraph 12 of this preamble.

Should the tenderer group a number of items together and tender one sum for such group of items, this single sum shall apply to that group of items and not to each individual item, or, should he indicate against any item that full compensation for such item has been included in another item, the rate for the item included in another item shall be deemed to be nil.

The tendered sums and rates shall be valid irrespective of any change in the quantities during the execution of the contract.

6. Notwithstanding any custom to the contrary, the work as executed will be measured for payment in accordance with the methods described in the contract documents under the various items of payment. Attention is directed to the provisions of the standard specifications regarding the measurement of quantities for payment. Except where specified otherwise the nett measurements or mass of the finished work in place shall be taken for payment, but any quantity of work in excess of that prescribed shall be excluded.

7. The amount of work or the quantities of materials stated in the schedule of quantities shall not be considered as restricting or extending the amount of work to be done or the quantity of materials to be supplied by the Contractor.

8. The stating of quantities of materials or the amount of work in the schedule of quantities shall not be regarded as authorisation for the Contractor to order material or to execute work. The Contractor shall obtain the Engineer's detailed instructions in regard to all work before ordering any materials for or executing the work, or before making arrangements in this regard.

9. The short descriptions of the items of payment given in the schedule of quantities are only for the purpose of identifying the items and of providing specific details. More details regarding the extent of the work entailed under each item appear inter alia, on the drawings, and in the specifications, the general conditions of contract and the special conditions of contract.

10. The provisions of the general conditions of contract shall apply to provisional sums and prime cost sums.

11. Subject to the conditions stated in paragraph 12 below, the rates and sums filled in by the tenderer in the schedule of quantities shall be final and binding and may not be adjusted should there by any mistakes in the extensions thereof. Should there be any discrepancies between the correctly extended and totalled schedule of quantities and the tender sum, the Employer shall have the right to make such adjustments to the tender sum as he may deem necessary in order to reconcile the total of the schedule of quantities with the tender sum. In their own interest, tenderers should make doubly sure of the correctness of their tendered rates, the extensions and the tender sum.

12. In order to ensure that payments certified by the Engineer are reasonably consistent with the market value of the work done, and that variations in quantities do not distort the contract valuation, the rates, prices and amounts tendered in the schedule of quantities are required to be in balance.

    A tender will be considered out of balance if :-

    (i) the combined, extended total tendered for the item :-

    Preliminary and General

    (a) Fixed – charged items

(b) Time-related items

Not to exceeds a maximum of 12% of the tender sum.

Or

(ii) The rates, prices or amounts tendered for any other items differ by more than 20 (twenty) percent from either the next highest or next lowest rates, prices or amounts tendered.

Any such unbalanced tender may be rejected if, after fourteen (14) days of having been given written notice by the Employer to adjust those rates or lump sums which are unreasonable or out of balance, the tenderer fails to make the necessary satisfactory adjustments. These adjustments in rectification will be such that increases are balanced by decreases, leaving the tender sum unchanged.

13. The units of measurement indicated in the schedule of quantities are metric units.

The following abbreviations are used in the schedule of quantities :-

mm	=	millimetre
m	=	metre
km	=	kilometre
km-pass	=	kilometre-pass
m^2	=	square metre
m^2-pass	=	square metre-pass
ha	=	hectare
m^3	=	cubic metre
m^3.km	=	cubic metre-kilometre
l	=	litre
kl	=	kilolitre
kg	=	kilogram
t	=	ton (1 000 kg)
No.	=	number
%	=	percent
PC sum	=	prime cost sum (An allowance calculated by the Engineer for works to which the Contractor is asked their mark up for overheads and profit)
Prov sum	=	provisional sum (Included in the Contract Sum to cover works or material, or both, the extent of which cannot be specifically detailed when entering the Contract).
kPa	=	kilopascal
t-km	=	ton-kilometre

h	=	hour
dia	=	diameter

14. All rates and sums of money quoted in the schedule of quantities shall be in rands and whole cents. Fractions of a cent shall be discounted.

15. Unless a separate rate for the supply and installation of any item is specifically called for, the supply and installation cost of any item shall be fully included in the unit rate.

DAY WORK LIST

GENERAL

Contractors must complete this list, which will be used to assess the value of work that the Engineer instructs in writing to be done on a day work basis, all in agreement with clause 6.5 of the General Conditions of Contract, 2015 and coupled Special Conditions of Contract. All the rates are fixed and shall be binding till the issuing of the final certificate, except for statutory increases that are announced from time to time. These unit rates shall be an all inclusive rate.

LABOUR COSTS

Rates for labour as listed below shall include all the allowances as specified in the General Conditions of Contract, 2015 and Special Conditions of Contract. The extra allowance, applicable on Labour costs listed below, is given in the tender appendix and must not be taken into account in this list.

Overtime costs incurred by this contract shall be paid in the same proportion as the amounts actually paid to the employees.

DESCRIPTION	UNIT	RATE
Unskilled labour	Hour	R ……
Semi-skilled labour	Hour	R ……
Skilled labour	Hour	R ……
Foreman / Section leader	Hour	R ……
Surveyor	Hour	R ……
Surveyor's assistant	Hour	R ……

EQUIPMENT COSTS

Full comprehensive hourly rates, which also include the cost of operators, must be listed below. Rates must also include all the costs of consumable items, maintenance, depreciation, tools, and all other coincidences that shall be necessary to operate the equipment for the purpose it is designed for. The rates must also include all the overhead costs, profits, site supervision, insurance, holidays with payment, travelling costs (or travelling allowances) and residence allowances of operators and any other allowances that are applicable on equipment. The Tenderer must list under each heading the make and specification of the equipment available.

DESCRIPTION	UNIT	RATE
1. Hydraulic, crawler mounted excavators (Caterpillar 235 type or similar) with 1 cubic meter bucket.	Hour	R ……
2. Front-end Loader (Caterpillar 939 type or similar)	Hour	R ……
3. Hydraulic tractor mounted backhoe (JCB 3C or similar)	Hour	R ……
4. Tipper Trucks 6 m³ 10 m³	 Hour Hour	 R …… R ……
5. Water truck 5 000 litres 10 000 litres	 Hour Hour	 R …… R ……
6. Concrete mixer 75 Litre concrete mixer	Hour	R ……
11. Vibratory poker	Hour	R ……
12. Compressor Mobile compressor, 4,7 cubic meters per minute, including hoses.	Hour	R ……

13. Accessories for compressor Rock drill and rods Jackhammer and steels	 Hour Hour	 R ……..…..…… R ……..…..……
14. Water pumps including hoses and suction connector 75mm 100mm 150mm	 Hour Hour Hour	 R …… R …… R ……
15. Compactors Vibratory plate 400mm sq. Vibratory drum roller 650mm wide Rammers	 Hour Hour Hour	 R …… R …… R ……
16. LDV, capacity 1.5 ton	Hour	R ……
17. Standing Time Water Construction Team (Rate to allow for all labour, machinery and other works associated with the construction process as listed under item 17 as may be determined as set out in clause 5.10 of GCC (2015)	 Day	 R ……
18. Other equipment ……..	 Hour	 R ……

C2.2 Bill of Quantities

Records the Contractor's prices for providing works which are described elsewhere in a specification within the Scope of Work section of the contract.

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SABS 1200 A	**SECTION A : PRELIMINARY AND GENERAL**				
A1	8.3	SCHEDULED FIXED-CHARGE ITEMS				
A1.1	8.3.1	Contractual Requirements	Sum	1		
	PSA 8.3.1					
	PSA 8.3.2	Establishment of Facilities on the Site				
A1.2	8.3.2.1	Facilities for Engineer				
A1.2.1		(a) Furnished office (1 No) (See PSAB 3.2)	Sum	1		
A1.2.2		(c) Nameboards (2 No.) (3.6 x 2.5m see PSAB 3.1)	Sum	1		
A1.2.3		(d) Supply of printer, catridge and paper	Sum	1		
A1.2.4		(e) Car Ports (2 No)	Sum	1		
A1.3	8.3.2.2	b) Facilities for Contractor				
A1.3.1		Offices and storage sheds, workshops and laboratories; Living accommodation, Ablution and latrine facilities, Tools and equipment, Water supplies, electric power and communications, dealing with water and access	Sum	1		
A1.4	8.3.3	Other Fixed-charge Obligations	Sum	1		
A1.5		Security of Contractor's Plant and Personnel	Sum	1		
A1.6		Compliance with OHS Specification and regulations	Sum	1		
A1.7	8.3.4	Removal of Site Establishment	Sum	1		
A2	8.4	SCHEDULED TIME-RELATED ITEMS				
A2.1	8.4.1	Contractual Requirements	Month	12		
	8.4.2	Operation and Maintenance of Facilities on site for the duration of construction, unless otherwise stated				
A2.2	8.4.2.1	Facilities for Engineer				
A2.2.1		(a) Furnished office (1 No)	Month	12		
A2.2.2		(c) Nameboards (2 No.)	Month	12		
A2.2.3		(d) Maintenance of computer and ancillary equipment	Month	12		
A2.2.4		(e) Car Ports (2 No)	Month	12		
A2.3	8.4.2.2	b) Facilities for Contractor				
A2.3.1		Offices and storage sheds, workshops and laboratories; Living accommodation; Ablution and latrine facilities; Tools and equipment; Water supplies; electric power and communications; dealing with water and access	Month	12		
A2.4	8.4.3	Supervision for the duration of Construction	Month	12		
A2.5	8.4.4	Company and Head Office overheads for duration of construction	Month	12		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
A2.6.	8.4.5	Other Time-related Obligations (8.4.1 to 8.4.4)				
A2.6.1		Security of Contractor's Plant and Personnel	Month	12		
A2.6.2		Watering of the Works	Month	12		
A3	8.5	SUMS STATED PROVISIONALLY BY THE ENGINEER				
A3.1		Providing accommodation of Engineer's staff	Prov. Sum	1		R108,000.00
A3.2		Percentage (%) mark-up on items A3.2 above profit	%	10%		
A.3.3	PSA 8.5.1	Provisional sum for special testing of material by an approved independent laboratory	Prov Sum	1		R15,000.00
A.3.4		Liaison with service providers and wayleave approvals	Prov Sum	1		R8,000.00
A3.5		Percentage (%) mark-up on items A3.4 to 3.5 above profit	%	10%		
	8.6	PRIME COST ITEMS				
A4		Supply or hire of specialist equipment for the detection of services	PC Sum	1	R30,000.00	R30,000.00
A5	PSA 8.7	DAYWORKS	PC Sum	1	R120,000.00	R120,000.00
A6.1	PSA 8.8.1	Accommodation of traffic	Sum	1		
A6.2	PSA 8.8.2	Hand excavate in all materials for the detection of existing services				
		Over Up to				
A6.2.1		0,0 m 1,0 m	m^3	100		
A6.2.2		1,0 m 2,0 m	m^3	150		
A6.2.3		2,0 m 3,0 m	m^3	10		
A6.3	PSA 8.8.7	Setting out of the works	Sum	1		
A6.4	PSA 8.8.8	Compliance with OHS Act and regulations including the construction regulations,2003	Sum	1		
A6.5	PSA 8.8.9	Compliance with Environmental Management Plan	Sum	1		
	SANS 1200AB	**ENGINEERS OFFICE**				
A7	PSAB 8.2	Survey assistance and equipment	Sum	1		
A8	PSAB 8.3	Provision Sum for the costs cellular phone, mobile connection and data	Prov. Sum	1	R16,000.00	R16,000.00
A9	PSAB 8.4	Handling costs and profit in respect of item A8	%	10%		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
A10	PD 12.01	Remuneration of the Project Liaison Officer and the members of the Project Liaison Committee				
A10.1		a) Project liaison officer(s) - stipend of R7500/month	PC Sum	1	R90,000.00	R90,000.00
A10.2		b) Project liaison committee - stipend of R300 per seating	PC Sum	1	R48,000.00	R48,000.00
		Contractor's handling costs, profit and all charges in respect of A10.1 to A10.2	%	10%		
	PC	**PROVISION OF STRUCTURED TRAINING**				
A11	PC 06.03	Training				
A11.1		a) Engineering (technical) skills	Prov Sum	1	R240,000.00	R240,000.00
A11.2		b) Generic skills	Prov Sum	1	R90,000.00	R90,000.00
A11.3		c) Training venue	Prov Sum	1	R15,000.00	R15,000.00
A11.4		Contractor's handling costs, profit and all charges in respect of A11.1 to A11.3	%	10%		
	PE	**HIV/AIDS AWARENESS**				
A12	PE 10.01	HIV/AIDS awareness obligations	Sum	1		
A13	PG	**ENVIRONMENTAL MANAGEMENT PLAN**				
A14	PG 11.04	Contractor's time related obligations in respect of Environmental management plan and specifications	Month	12		
TOTAL CARRIED FORWARD TO SUMMARY						

ITEM	LI	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
B.1		SANS 1200C	**SECTION B: SITE CLEARANCE**				
B.1.1		8.2.1	**Clear and grub:**				
	LI		a) areas as instructed by the Engineer	m^2	2325		
	LI		b) strips, 1,5 m wide along centreline of pipe route to a maximum width of 1,0 m on each side of the pipeline centerline where clearing and grubbing exist	m	15500		
B.1.2		8.2.2	Remove and grub large trees and tree stumps of girth:				
	LI		a) over 1.0 m up to and including 2.0 m	No	3		
	LI		b) over 2.0 m up to and including 3.0 m	No	5		
	LI		c) over 3.0 m in steps of 1.0 m	No	1		
B.1.3		8.2.5	Take down existing fences and reinstate to original condition on completion of the scheduled work	m	1000		
B.1.5		8.2.8	Demolish and remove structures/buildings and dismantle steel work as ordered and directed by Engineer on site				
	LI		a) Building in mansory or brick work complete	Prov. Sum	1		R50,000.00
			b) Percentage (%) mark-up on item B.1.5 a) above profit	%	10%	R50,000.00	
B.1.6		8.2.9	Transport materials and debris to unspecified site and dump	m^3.km	800		
B.1.7		8.2.10	Remove topsoil to nominal depth of 150 mm, stockpile, maintain free from contamination of other excavate material from trench excavation to a maximum of 1500 mm as ordered by the Engineer	m^3	7750		
B.1.8	LI		Dealing with fences	m	480		
B.1.8.1			Supply and erect temporary gates 3,0 m x 1,2 m high	No	2		
B.1.8.2			Supply and erect permanent gates 4,2 m x 1.2 m high	No	1		
B.1.8.3		8.2.13	Temporary dismantling and reinstatement of road reserve fencing	m	150		
TOTAL CARRIED FORWARD TO SUMMARY							

ITEM	LI	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			SECTION C: EXCAVATION AND BEDDING				
		SANS 1200 DB	**EARTHWORKS: PIPE TRENCHES**				
C.1.2		8.3.2	**EXCAVATION**				
C.1.2.1		PSDB 8.3.2(a)	Excavate in all materials for trenches, backfill, compact and dispose of surplus material (including intermediate excavation)				
			Pipes nominal diameter over 50 mm up to 315 mm at depths as follows:				
			Over Up to				
C.1.2.2			0,0 m 1,0 m	m	403		
C.1.2.3			1,0 m 2,0 m	m	90876		
C.1.2.4			2,0 m 3,0 m	m	638		
			3,0 m 4,0 m	m	12		
C.1.3		8.3.2(b)	Extra over Item 2.2.1.1 to 2.2.1.4 incl. for excavation (provisional) in:				
C.1.3.1			a) Hard rock material	m^3	348.75		
C.1.4		8.3.3	**EXCAVATION ANCILLARIES**				
C.1.4.1		8.3.3.1	Make up deficiency in backfill material (Provisional)				
C.1.4.2			a) From other necessary excavations on site	m^3	1395		
C.1.4.3			b) By importation from designated borrow pits	m^3	139.5		
			c) By importation from commercial or off-site soures selected by the contractor	m^3	139.5		
C.1.4.4		8.3.3.2	Opening up and closing down of designated borrow pit (Provisional)	No	1		
C.1.4.5		8.3.3.3	Compaction in road reserves	m^3	697.5		
C.1.4.6		8.3.3.4	Overhaul:				
C.1.4.7			a) Limited overhaul (provisional)	m^3	1500		
C.1.4.8			b) Long overhaul (provisional)	m^3.km	650		
C.1.5		8.3.6	**FINISHING**				
C.1.5.1		8.3.6.1	Reinstate road surface complete with coarse:				
C.1.5.1.1			a) Selected layer (150 mm thick) material G7 quality compacted to 93% mod. AASHTO density	m^3	100		
C.1.5.1.2			b) sub-base layer (150 mm thick) material G6 quality compacted to 95% mod. AASHTO density stabilized with 3% cement	m^3	100		
TOTAL CARRIED FORWARD							

ITEM	LI	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD							
C.2	LI	SABS 1200 LB	**BEDDING PIPES**				
C.2.1		8.2.1	Provision of bedding from trench excavation (Without screening)				
			a) Selected granular material	m^3	232.5		
			b) Selected fill material	m^3	542.5		
C.2.1.1		8.2.2	Supply only of bedding by importation				
		8.2.2.1	With screening				
			a) Selected granular material	m^3	232.5		
			b) Selected fill material	m^3	542.5		
C.2.1.1.2		8.2.2.2	**Import from borrow pit (Only with written consent of Engineer)**				
			a) Selected granular material	m^3	232		
			b) Selected fill material	m^3	54		
C.3		SABS 1200 DB	**EXISTING SERVICES**				
C.3.1		8.3.5(a)	Services that intersect a trench, for an individual service or services bundled together				
C.3.1.1			Electric cables	No	200		
C.3.1.2			Water mains and drain/stormwater pipes up to 600 mm diameter	No	10		
C.3.1.3			Overhead power lines	No	2		
C.3.1.4			Optic fibre Telkom lines	No	2		
C.3.2		8.3.5(b)	Services that adjoin a trench				
C.3.2.1			Overhead power lines	km	10		
C.4		8.3.3	**Excavation Ancillaries**				
C.4.1		8.3.3.1	Make up deficiency in backfill material				
C.4.1.1.			from other necessary excavations on site (Provisional)	m^3	54.25		
C.4.2			Overhaul				
C.4.2.1			Limited overhaul up to 1 km	m^3	2500		
C.4.2.2			Long overhaul exceeding 1 km	m^3km	500		
TOTAL CARRIED FORWARD							

ITEM	LI	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD							
C.5		8.3.6	**Finishing**				
C.5.1		8.3.6.1	Reinstate road surfaces				
C.5.1.1			Gravel surfaces (100 mm deep)	m²	122		
C.5.1.2			Gravel shoulders (100 mm deep)	m^2	85		
C.5.1.3			Selected layer (150 mm thick) material G7 quality compacted to 93% mod. AASHTO density	m^3	23		
C.5.1.4			Sub-base layer (150 mm thick) material G6 quality compacted ti 95% mod. AASHTO density stabilized with 3% cement.	m^3	23		
C.5.1.5			Base layer (150 mm thick) material G3 quality compacted to 98% mod. AASHTO density.	m^3	23		
C.5.1.6			Prime MC 30 applied at 0.9 l/m2	l	105		
C.5.1.7			Asphalt 30mm thick continuously graded	m^2	9		
C.5.1.8			Extra over item C.5.1.4 for stabilization with 3% ordinary portland cement including mixing, placing and curing	m^3	10		
C.5.2			Reinstate pipe route to original condition including vegetation of areas where vegetation was removed as ordered and directed by the Engineer	Sum	1		
C.5.3			Construct service road, 150 mm insitu layer prepared and compacted to 93% mod. AASHTO with gravel wearing coarse 150 mm thick and compacted to grade and 95% mod. AASHTO	m^3	14		
TOTAL CARRIED FORWARD TO SUMMARY							

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		SECTION D: PRESSURE PIPES				
	SANS 1200L	**MEDIUM- PRESSURE PIPELINES**				
D.1	8.2.1	Supply, lay joint, test and disinfect the following pipes. Complete with couplings to the relevant SABS or ISO standards including short lengths				
D.1.1	LI	uPVC pipes to SABS 996 or ISO 4422 (Class C bedding as per drawing CIV 500)				
		b) 75 mm class 9	m	64805		
		c) 110 mm class 9	m	13688		
		d) 160 mm class 9	m	7004		
		e) 200 mm class 9	m	5523		
		f) 250 mm class 9	m	1390		
D.1.2	8.2.2	**FITTINGS FOR uPVC PIPES** Extra over item D.1 for supplying, installing, bedding and testing the following fittings and specials for uPVC pressure pipes complete. Cutting of pipes and couplings included.				
D.1.2.1.		Bends - 90°				
		a) 75 mm dia	No	90		
		b) 110 mm dia	No	9		
		c) 160 mm dia	No	3		
		d) 200 mm dia	No	2		
		e) 250 mm dia	No	1		
		Bends - 45°				
		a) 75 mm dia	No	70		
		b) 110 mm dia	No	9		
		c) 160 mm dia	No	5		
		d) 200 mm dia	No	1		
		e) 250 mm dia	No	1		
		Bends - 11.25°				
		a) 75 mm dia	No	283		
		b) 110 mm dia	No	20		
		c) 160 mm dia	No	5		
		d) 200 mm dia	No	4		
		e) 250 mm dia	No	1		
		Bends - 22.5° a) 75 mm dia	No	120		
		b) 110 mm dia	No	5		
		c) 160 mm dia	No	7		
		d) 200 mm dia	No	1		
		e) 250 mm dia	No	1		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
D.1.2.2		Equal Tees				
		a) 75 x 75 mm	No	80		
		b) 90 x 90 mm	No	1		
		c) 110 x 110 mm	No	26		
		d) 160 x 160 mm	No	1		
		e) 200 x 200 mm	No	5		
		f) 250 x 250 mm	No	2		
D.1.2.3		Reducing Tee				
		a) 90 x 75 mm	No	6		
		b) 110 x 90 mm	No	5		
		c) 110 x 75 mm	No	8		
		d) 160 x 90 mm	No	9		
		e) 160 x 110 mm	No	5		
		f) 200 x 110 mm	No	2		
		g) 200 x 160 mm	No	2		
		h) 250 x 160 mm	No	1		
D.1.2.4		End caps				
		a) 75mm dia	No	46		
		b) 110mm dia	No	16		
		c) 160mm dia	No	7		
		d) 200mm dia	No	4		
		e) 250mm dia	No	2		
D.1.3	8.2.3	Extra over item 8.2.1 for supplying, installing, bedding and testing of socket in line valve assemblies (Class 16)				
		c) 150mm Pressure Reducing Valve	No	5		
D.1.4	8.2.8	Recover old pipeline				
		a) over 1.0m up to 1.5m deep	m	155		
D.1.4	8.2.3	socket in line valve assemblies (Class 16)				
		a) 80mm Gate Valve	No	177		
		b) 100mm Gate Valve	No	33		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
		d) 200mm Gate Valve	No	4		
		e) 250mm Gate Valve	No	2		
D.1.6	8.2.5	Supply and place pipes, valves and specials for Pressure Reducing Valve chamber as specified and detailed on drawing CIV. 505 all flanged drilled to SABS 1123, Table 2500/3				
	8.2.11	Thrust blocks as per typical details drawing				
		a) Concrete class 20/19	No	180		
D1.7	8.2.13	Valve and Hydrant Chambers				
D.1.7.1		In line valve chamber complete as per drawing no Civ. 502	No	9		
D.1.7.3		Fire hydrant complete as per drawing No. Civ 502 withhydrant T piece, flanged valve, valve box, hydrant end piece, piping fitting and cutting on:				
		a) 160mm dia pipe	No	1		
		b) 110mm dia pipe	No	1		
		c) 75mm dia pipe	No	9		
		SUNDRIES				
		Position markers as per drawing no CIV 502 and white washed each	No	9		
	SANS 1200 DK	**GABIONS AND PITCHING**				
D.1.8.3	8.2.1	Surface preparation for bedding of gabions	m^2	233		
D.1.8.4	8.2.2	a) Galvanized gabion boxes 1.0 m x 1.0 m x 0.5 m with 80 mm x 100 mm mesh and 2.2mm dia mesh wire	m^3	50		
		b) Galvanized gabion mattresses 0.3 mm deep with 80 mm x 100 mm mesh, 2.2mm dia mesh wire and diaphragms at 1 m centres	m^3	50		
TOTAL CARRIED FORWARD						

ITEM	LI	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			SECTION E: HOUSE CONNECTIONS				
		SANS 1200 LF	**ERF CONNECTIONS**				
E.1		8.2.1	Supply erf connections including saddle, all fittings and ball valve complete as per drawing CIV.504				
E.1.1			a) Erf connection Type 1	No	782		
E.1.2		8.2.3	Extra-over item 8.2.1 for specials (if any):				
E.1.2.1			a) Surface box complete with brick work and working platform	No	982		
E.1.2.2			b) 20mm cobra type ball valve	No	982		
E.2		8.2.4	Supply and install water meter complete with couplings	No	982		
E.3		8.2.5	Site testing of meters	No	982		
E.4		8.2.6	Supply yard connection complete from water meter box including tap, Y standard concrete support straps and ancillary works as per drawing CIV. 504	No	982		
E.5	LI	PSLF 8.2.9	Extra-over item E.1.1 to excavate in all materials for trenches, backfill, compact and dispose of surplus material (including intermediate excavation)				
			Pipes nominal diameter up 50 mm at depths as follows:				
			Over Up to				
E.5.1			0,0 m 1,0 m	m	3652		
E.5.2		PSLF 8.2.10	Extra over item E.1.1 for the supply, lay joint, test and disinfect the following pipes. Complete with couplings to the relevant SABS or ISO standards including short lengths	m	3652		
E.6			HDPE pipes to SANS 4427 - PE 100 (Class C bedding as per drawing CIV 500)				
E.6.1			a) 25 mm PN 12.5	m	600		
E.6.2			b) 20 mm PN 12.5	m	3652		
TOTAL BROUGHT TO SUMMARY							

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SANS 1200LG	**SECTION F: PIPE JACKING**				
		Road crossing D1399				
F.1	8.2.1	Jacking Establishment				
F.1.1		a) Fixed costs	Sum	1		
F1.1.2		b) Time-related charges	Month	2		
F.3	8.2.2	Supply of DN 300 Class 100D Type SC reinforced concrete pipe	m	40		
F.4	8.2.3	Jacking of DN 300 Class 100D Type SC	m	40		
F.5	8.2.4	Excavation for jacking	m3	40		
F.6	8.2.5	Extra-over 8.2.1 for unforeseen rock	Sum	1		
F.7	8.2.6	Brick-up ends of DN 300 concrete sleeve as per drawing	No	4		
F.8	8.2.7	Expose existing services	m	150		
	SANS 1200 DB	**EARTHWORKS (Pipe trenches)**				
F.8	8.3.2	**EXCAVATION**				
F.8.1	8.3.2(a)	Excavate in all materials for trenches, backfill, compact and dispose of surplus material (including intermediate excavation)				
		Pipes nominal diameter over 300 mm up to 400 mm at depths as follows:				
		Over Up to				
F.8.1.1		0,0 m 1,0 m	m	5		
F.8.1.2		1,0 m 1,5 m	m	30		
F.8.1.3		1,5 m 2,0 m	m	10		
F.8.1.4		2,5 m 3,0 m	m	5		
F.9	8.3.2(b)	Extra over Item E.6.1.1 to E.6.1.4 incl. for excavation (provisional) in:				
F.9.1		3) Excavation in half widths for road crossing	m	40		
F.10	8.3.7	Accommodation of traffic at 2 crossings inclusive of signage as per drawing and flag persons	Sum	1		
TOTAL CARRIED FORWARD TO SUMMARY						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		SECTION G: REHABILITATION OF INTERNAL BULK FEEDER LINES				
G1		Rehabilitation of bulk internal feeder lines	PC Sum	1		R2,300,000.00
TOTAL CARRIED FORWARD TO SUMMARY						

ITEM	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		SECTION H: INSTALLATION OF NEW STEEL TANK				
H1		Supply and erect 150 kl capacity elevated pressed steel reservoir with base 15.0m above natural ground level complete with all connection pipework as per manufacturers specifications.	PC Sum	1		R 3,100,000.00
H2		**EARTHWORKS FOR FOUNDATIONS**				
	2.1	Excavate in all materials and dispose excess material	m^3	30		
H3		**MISCELLANEOUS**				
	3.1	Allow for the filling of the tank once with clean water for testing purpose	No	1		
	3.2	Supply 150g of Calcium Hyperchloride per m^3 of water for sterilising the elevated tank	kg	325		
H4		**CONCRETE (STRUCTURAL)**				
H4.1		**SCHEDULE FORMWORK ITEMS**				
	4.1.1	Rough surface finish (vertical)	m^2	10		
	4.1.2	Smooth surface finish (vertical)	m^2	10		
H5		**SCHEDULE REINFORCEMENT ITEMS**				
	5.1	a) Mild steel bars	t	0.5		
	5.2	b) High-tensile steel bars	t	1		
H6		**SCHEDULE CONRETE ITEMS**				
	6.1	Blinding layer in foundation concrete				
	6.2	Minimum 75mm thickness, 20mPa/19mm grade	m^2	50		
	6.3	Strength concrete, 30MPa/19mm	m^3	34		
H7		**STRUCTURAL STEELWORK**				
H7.1		**SCHEDULED ERECTION BOLTS ITEMS**				
	7.1.1	Supply, deliver and install M24 HD bolts, 100mm long, including washers and nuts, complete as per detailed drawings	No.	64		
TOTAL CARRIED FORWARD TO SUMMARY						

SECTION DB - EARTHWORKS (PIPE TRENCHES)							
ITEM NO	LIC	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		SANS 1200DB	**EARTHWORKS (PIPE TRENCHES)**				
		8.3.2	**Excavation** a) (i) Excavation in all materials for trenches, backfill, compact and dispose of surplus material Pipes nominal diameter over 50 mm up to 315 mm at depths as follows: Over Up to				
DB-1.1.1			0,0 m 1,0 m	m	1,188		
DB-1.1.2			1,0 m 1,5 m	m	1,188		
DB-1.1.3			1,5 m 2,0 m	m	100		
			b) Extra-over for item 8.3.2				
DB-1.1.6			1) Intermediate excavation	m^3	91		
DB-1.1.7			2) Hardrock excavation	m^3	54		
DB-1.1.8			c) Excavate and dispose of unsuitable material from trench bottom (Prov)	m^3	91		
		8.3.3	**Excavation Ancillaries**				
		8.3.3.1	Make up deficiency in backfill material (Prov.)				
DB-1.1.19			c) by importation from commercial or off-site sources selected by the Contrator	m^3	18		
		P.S.D.B. 8.3.6.1	Finishing (a) Reinstate road surfaces complete with all courses:				
DB-1.1.20			(i) Selected layer (150 mm thick) material G7 quality compacted	m^2	15		
DB-1.1.21			(ii) Sub base layer (150 mm thick) material G6 quality	m^2	15		
DB-1.1.22			(iii) Base layer (150 mm thick) material G3 quality compacted to	m^2	15		
DB-1.1.23			(iv) Prime MC 30 applied at 0.9 l/m2	m^2	15		
DB-1.1.24			(v) Asphalt 30mm thick continuously graded	m^2	15		
DB-1.1.25			(vi) Removal and replacement of existing kerbing (precast)	m	15		
DB-1.1.26			(vii) Extra over item DB-1.1.23 to DB-1.1.25 for stabilization with	m^3	10		
DB-1.1.27			(viii) Gravel road surfaces	m^2	20		
DB-1.1.28			(ix) Gravel shoulders	m^2	120		
DB-1.1.29			(x) Reinstate pipe route to original condition including vegetation	P Sum	1		
DB-1.1.30			(b) Remove, store and reinstate block or brick paving to original	P Sum	1		
TOTAL CARRIED FORWARD TO SUMMARY							

SECTION C - SITE CLEARANCE

ITEM NO	LI C	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		SANS 1200C	**SITE CLEARANCE**				
C-1.1.1		8.2.1	Clear and grub (site servitude 5m width)	m	2,376		
		8.2.2	Remove and grub large trees and tree stumps of girth				
C1.1.2	LI		(a) over 1m and up to and including 2m	No	3		
C-1.1.3	LI		(b) over 2m and up to and including 3m	No	2		
C-1.1.4			(c) over 3m and up to and including 4m	No	2		
		8.2.5	Take down existing fences				
		PSC 8.2.5.1	(a) Dismantling, store and reinstating to original or better condition				
C-1.1.5			(i) Up to 1,8m high diamond mesh	m	100		
C-1.1.6			(ii) Up to 1,8m high with max 5 string wires	m	100		
C-1.1.7			(iii) Up to 1,8m high chicken mesh	m	100		
C-1.1.8			(iv) Up to 1,8m high palisade	m	100		
			(b) Breakdown and rebuilding of boundary walls				
C-1.1.9			(i) Up to 1,8m high 110mm brick wall without plaster (any pattern)	m	100		
C-1.1.10			(ii) Up to 1,8m high 110mm brick wall including plaster (any	m	100		
TOTAL CARRIED FORWARD TO SUMMARY							

SECTION L - MEDIUM-PRESSURE PIPELINES							
ITEM NO	LIC	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		SANS 1200L	**MEDIUM-PRESSURE PIPELINES**				
			Construction of reticulation system				
	LI	8.2.1	a) Class 9 mPVC pipes, SANS 966:1998 Part 1 (uPVC)				
L-1.1.1			1) 63 mm dia	m	2,050		
L-1.1.2			2) 75 mm dia	m	50		
L-1.1.3			3) 90 mm dia	m	158		
L-1.1.4			4) 110 mm dia	m	100		
L-1.1.5			5) 160 mm dia	m	50		
L-1.1.6			6) 200 mm dia	m	50		
	LI	8.2.2	Extra over for item L-1.1.1 to L-1.1.8 for the supplying, laying and bedding of specials complete with couplings				
			a) mPVC 90° Bends (Class 16):				
L-1.1.6			1) 63 mm dia	No	20		
L-1.1.7			2) 75 mm dia	No	10		
L-1.1.8			3) 160 mm dia	No	5		
L-1.1.9			4) 200 mm dia	No	2		
L-1.1.10			5) 250 mm dia	No	1		
			b) mPVC 45° Bends (Class 16):				
L-1.1.11			1) 63 mm dia	No	20		
L-1.1.12			2) 75 mm dia	No	10		
L-1.1.13			3) 160 mm dia	No	5		
L-1.1.14			4) 200 mm dia	No	2		
L-1.1.15			5) 250 mm dia	No	1		
			c) mPVC 22.5° Bends (Class 16):				
L-1.1.16			1) 63 mm dia	No	20		
L-1.1.17			2) 75 mm dia	No	10		
L-1.1.18			3) 160 mm dia	No	5		
L-1.1.19			4) 200 mm dia	No	2		
L-1.1.20			5) 250 mm dia	No	1		
			d) mPVC 11.25° Bends (Class 16):				
L-1.1.20			1) 75 mm dia	No	10		
L-1.1.22			2) 160 mm dia	No	5		
L-1.1.23			3) 200 mm dia	No	2		
L-1.1.24			4) 250 mm dia	No	1		
			e) mPVC T-junction (Class 16)				
L-1.1.25			1) 63 mm dia	No	20		
L-1.1.26			2) 75 mm dia	No	10		
L-1.1.27			3) 110 mm dia	No	5		
TOTAL CARRIED FORWARD							

ITEM NO	LI C	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD							
L-1.1.28			4) 160 mm dia	No	5		
L-1.1.29			5) 200 mm dia	No	2		
L-1.1.30			6) 250 mm dia	No	1		
L-1.1.31			7) 315 mm dia	No	1		
		8.2.13	Valve and Hydrant Chambers, etc				
L-1.1.32			a) Resilient Gate Valves (Class 16):				
L-1.1.33			1) 63mm dia	No	10		
L-1.1.34			2) 75mm dia	No	5		
L-1.1.35			3) 90mm dia	No	3		
L-1.1.36			4) 110mm dia	No	5		
L-1.1.37			5) 160mm dia	No	1		
L-1.1.38			6) 200mm dia	No	2		
L-1.1.39			7) 250mm dia	No	1		
L-1.1.40			b) Supply & Install fire hydrant complete as per drawing	No	1		
L-1.1.41			c) Isolating Valve Box complete as per drawing	No	108		
		8.2.11	**Anchor/Thrust Block and Pedestals**				
			Anchor Block for pipelines complete as specified on drawings. Maximum Working pressure including surge 900kPa				
L-1.1.42			1) Concrete, 35MPa	m^3	1		
L-1.1.43	LI		2) Blinding, 15MPa concrete	m^2	1		
L-1.1.44	LI		3) Reinforcement	t	0.03		
TOTAL CARRIED FORWARD TO SUMMARY							

SECTION L - MEDIUM-PRESSURE PIPELINES

ITEM NO	LIC	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		SANS 1200LF	**ERF CONNECTIONS (WATER)**				
		8.2.1	Provide and install erf connections complete (Supply erf connections including saddle and all fittings complete as per drawing (Incl 1m 25mm HDPE PN12.5)				
LF-1.1.1			b) Erf Connection Type 1	No	108		
		8.2.2	Extra over Item 8.2.1 for specials				
LF-1.1.2			1) Surface box complete with brick work and working platform as per dwg	No	108		
LF-1.1.3			2) 20mm cobra type ball valve	No	108		
LF-1.1.4		8.2.3	Supply and install water meter complete with coupling	No	108		
LF-1.1.5		8.2.4	Site Testing of meters	No	108		
LF-1.1.6		8.2.5	Supply and install Yard Connection complete from water meter box including tap, Y standard, concrete, support straps, hand excavation and ancillary works as per dwg	No	108		
	LI	PSLF 8.2.9	Extra-over item E.1.1 to excavate in all materials for trenches, backfill, compact and dispose of surplus material (including intermediate excavation) Pipes nominal diameter up 50 mm at depths as follows:				
LF-1.1.9			Over 0,0 m Up to 1,0 m	m	216		
LF-1.1.10		PSLF 8.2.10	Extra over item LF-1.1.1 for the supply and install, lay joint, test and disinfect the following pipes. Complete with couplings to the relevant SABS or ISO standards including short lengths	m	216		
			HDPE pipes to SANS 4427 - PE 100 (Class C bedding as per drawing CIV 500)				
LF-1.1.11			a) 25 mm PN 12.5	m	10		
LF-1.1.12			b) 20 mm PN 12.5	m	216		
TOTAL CARRIED FORWARD TO SUMMARY							

SECTION LB - BEDDING

ITEM NO	LI C	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	LI	SANS 1200 LB	**BEDDING (PIPES)**				
		8.2.1	Provision of bedding material from trench excavation				
		8.2.1.1	Without the need of screening				
LB-1.1.1			(a) Selected granular material	m³	294		
LB-1.1.2			(b) Selected fill material	m³	183		
		8.2.1.2	Including screening				
LB-1.1.3			(a) Selected granular material	m³	294		
LB-1.1.4			(b) Selected fill material	m³	183		
TOTAL CARRIED FORWARD TO SUMMARY							

SECTION GA - CONCRETE (Small Works)							
ITEM NO	**LIC**	**PAYMENT REF**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
		SANS 1200GA	**CONCRETE (Small Works)**				
		8.2	**SCHEDULED FORMWORK ITEMS**				
GA-1.1.1		8.2.1	Rough	m^2	10		
GA-1.1.2		8.2.2	Smooth	m^2	10		
GA-1.1.3		8.2.3	Narrow widths (up to 300mm wide)	m	1		
	LI	**8.3**	**SCHEDULED REINFORCEMENT ITEMS**				
		8.3.1	Steel Bars				
			a) Mild-tensile steel bars in the following:				
GA-1.1.4			(i) R10	t	0.04		
			b)High-tensile steel bars in the following:				
GA-1.1.5			(i) Y10	t	0.04		
		8.3.2	High-Tensile Welded Mesh:				
GA-1.1.6			Reinforcing Mesh 617	m^2	1		
		8.4	**SCHEDULED CONCRETE ITEMS**				
GA-1.1.7	LI	8.4.2	Blinding layer in 50mm concrete	m^2	36		
GA-1.1.8		8.4.3	a) Strength concrete, Grade 35MPa	m^3	2		
		8.4.4	Unformed surface finishes				
GA-1.1.9			a) Steel-floated finish	m^2	36		
GA-1.1.10			b) Wood-floated finish	m^2	36		
TOTAL CARRIED FORWARD TO SUMMARY							

SECTION H- REHABILITATION OF INTERNAL BULK FEEDER LINES						
ITEM NO	**PAYMENT REF**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
	SANS 1200LG	**SECTION LG: INTERNAL BULK FEEDER LINES**				
LG1		bulk internal feeder lines				
		Elokhishini Bulk Feeder Line to Phooku 5500m	PC Sum	1	R 10,850,696.75	R 10,850,696.75
TOTAL CARRIED FORWARD TO SUMMARY						

SECTION I- BREAK PRESSURE TANKS						
ITEM NO	**PAYMENT REF**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
		SECTION I: BREAK PRESSURE TANKS				
I1.1		Construction of break pressure tanks 25kl Supply, deliver, erection and corrossion protection sectional pressed steel tank with cover, access, two roof vents, catladder, 4 pipe connections, float level indicator, flow control and cut off valve, lighting protection and connection to water reticulation complete on position as indicated on the drarings of break pressure/storage tank 3.6 x 3.6 x 2.4m as per drawing CIV 508 on 15m stand as per Particular specification PET.	PC Sum	1		R 670,100.00
TOTAL CARRIED FORWARD TO SUMMARY						

SEKHUKHUNE DISTRICT MUNICIPALITY

SUMMARY OF SCHEDULES

	SECTION 1: PHOOKO AND PHOOKWANE	
SECTION A :	PRELIMINARY AND GENERAL	R .....
SECTION B :	SITE CLEARANCE	R .....
SECTION C :	EXCAVATION AND BEDDING	R .....
SECTION D :	PIPEWORKS	R .....
SECTION E :	HOUSE CONNECTIONS	R .....
SECTION F :	PIPE JACKING	R .....
SECTION G :	REHABILITATION OF INTERNAL BULK FEEDER LINES	R .....
SECTION H :	INSTALLATION OF NEW STEEL TANK	R .....
	SECTION 2: ELOKHISHINI EXTENSION	
SECTION DB :	EARTHWORKS (PIPE TRENCHES)	R .....
SECTION C :	SITE CLEARANCE	R .....
SECTION L :	MEDIUM-PRESSURE PIPELINES	R .....
SECTION LF :	ERF CONNECTIONS (WATER)	R .....
SECTION LB :	BEDDING (PIPES)	R .....
SECTION GA :	CONCRETE (SMALL WORKS)	R .....
SECTION LG :	INTERNAL BULK FEEDER LINES	R .....
SECTION I :	BREAK PRESSURE TANKS	R .....
SUB-TOTAL 1	**(SECTIONS 1 AND 2)** `	R .....
CONTINGENCY ALLOWANCE:		
ADD:	10% of the Sub-Total 1 for **CONTINGENCIES**	
SUB-TOTAL 2	The amount provided here is under the sole control of the Engineer and may be deducted in whole or in part	R .....
SUB-TOTAL 3	Sum of Sub-Totals 1 to 2	R .....
ADD:		
SUB-TOTAL 4	15% of the above Sub-Total 3 for **VALUE ADDED TAX**	R .....
TOTAL TENDER AMOUNT	Sum Sub-Total 3 plus Sub-Total 4	R .....
	TOTAL TO BE CARRIED FORWARD TO FORM OF OFFER	

Signature ……..…… Date. .....

(Signature of the person authorised to sign on behalf of the tenderer)

PART C3 SCOPE OF WORK

SECTION CONTENTS

C3.1 Description of the Works 143

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C3.3 Procurement 150

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C3.5 Management 279

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C3.1 Description of the Works

STATUS

The Standard Specifications that form part of this Contract have been written to cover all phases of work normally required for road contracts and may therefore cover items of work not applicable to this particular Contract.

The Project Specifications form an integral part of the Contract Documents, supplement the Standard Specifications, and take precedence in the event of discrepancies with the Standard Specifications, the Bill of Quantities or the Drawings.

C3.1.1 Employer's Objectives

The Employer's objectives are to deliver potable water infrastructure to the villages of Moutse East and West that fall within the Ephriam Mogale and Elias Motsoaledi Local Municipality. These municipalities fall under the Sekhukhune District Municipality in Limpopo Province.

Objectives during construction are to provide black empowered economic enterprise contractors with a portion of the work, work opportunities to the local communities, provide training to local and other labourers and to execute and complete the work with a high degree of safety, sensitivity to the environment and quality.

C3.1.2 Overview of the Works

The works entails the excavation, supply, bedding, laying, backfilling and testing of the water pipelines for the internal reticulation network in ELOKHISHINI, PHOOKO AND PHOOKWANE Village

C3.1.3 Extent of the Works

The villages will be provided with water from a draw-off point on the gravity DN 200 Five Morgan line from Lusaka reservoir with about 92410m total reticulation length.

a) Phooko Village

The scope of works components under the Phooko village comprises the following:

- Installation of 75 to 250mm uPVC diameter water pipelines. All pipes are uPVC with pressure ratings PN9
- Ancillary works such as valve chambers with pipe work relevant control mechanisms, thrust blocks etc
- Valve boxes and chambers and isolating valves
- Yard connections
- Pressure testing of the pipeline
- Installation of 150kl elevated tank

b) Phookwane Village

The scope of works components under Phookwane village comprises the following:

- Installation of 75 to 250mm uPVC diameter water pipelines. All pipes are uPVC with pressure ratings PN9
- Ancillary works such as valve chambers with pipe work relevant control mechanisms, thrust blocks etc

- Valve boxes and chambers and isolating valves
- Yard connections
- Disinfecting of the pipeline
- Pressure testing of the pipeline
- Refurbishment of existing bulk pipeline from Lusaka

c) Elokhishini ward 9

The scope of works components under Elokhishini village ward 9 comprises the following:

- Installation of 5.5km bulk pipeline from Elandsdoorn reservoir to the new elevated tank, and
- Erf connections to the ward 9 house stands.
- Pressure testing of the pipeline
- Ancillary works such as valve chambers with pipe work relevant control mechanisms, thrust blocks etc

Approximate quantities for the various construction works are included in the bill of quantities

C3.1.4 Construction Program and Method

Early completion of the works is of prime importance.

Immediately after the handing over of the site, the Engineer and the Contractor shall discuss the order of procedure and methods in which the Contractor shall carry out the works, in order to give priority to certain parts of the works and to avoid delays, and ensure that the existing works operate continuously during the construction period, after which the Contractor shall compile and submit to the Engineer, within (2) two weeks, a Gantt chart showing the construction program.

The construction activities must be programmed to be suitable in terms of his resources to complete the contract inside the stipulated time period.

Sufficient photos of the existing infrastructure must be taken by the Contractor and handed over to the Engineer before such operations commence. No payment will be made in this regard and it shall be deemed covered in the preliminary and general items.

C3.1.5 Location of the Works

This project falls within the Sekhukhune District Municipality under Elias Motsoaledi Local Municipality in Limpopo Province. The site coordinates for ELOKHISHINI, PHOOKO AND PHOOKWANE are as follows:

<u>Elokhishini</u>
Latitude : 29^{0}11’02’’ E
Longitude : 25^{0}17’50’’ S

<u>Phookwane</u>
Latitude : 29^{0}10’23’’ E
Longitude : 25^{0}17’13’’ S

<u>Phooko</u>
Latitude : 29^{0}09’09’’ E
Longitude : 25^{0}18’04’’ S

C3.1.6 Temporary Works

The Contractor will be required to ensure temporary water supply to the stands adjacent to where the Contractor is to disconnect the water supply to do the pipe bursting and sleeving.

C3.1.7 Accommodation of Traffic

Vehicles will be required to be accommodated throughout the project to ensure access to all the different villages alongside the route. It is therefore envisaged that vehicles travelling on the route be accommodated by constructing temporary deviations next to the existing gravel road within the road reserve.

Actual accommodation of traffic proposals to be used on the project shall be submitted timeously for the Engineer's approval. Particular attention shall be given to accesses and intersecting roads.

C3.1.8 Existing services

The following existing services may be encountered within the road reserve:

- Telkom lines;
- Overhead power lines;
- Electrical cables;
- Water pipes from farmers crossing through culverts.

Any overhead services crossing the roads, must clear the final road level by at least 6,5m.

Telkom and Eskom overhead lines affected by the construction are to be relocated by the service owners. The positions of these services are shown on the layout drawings.

C3.1.9 Maintenance works

The Contractor shall be responsible for maintaining the entire length of road reserve, from the date of handing over of the site until the date of issue of the certificate of completion of the Works.

Once the certificate of completion of the Works has been issued the responsibility for normal maintenance of the water nerwork (e.g. collection of litter, clearing of outlets, repair of valve chambers and boxes damaged by the public, etc) shall revert back to the Sekhukhune District Municipality. The Contractor shall, however, still be responsible for the contractual maintenance during the Defects Liability Period.

C3.1.10 Drawings

The reduced drawings that form part of the Tender Documents are to be used for tender purposes only.

The Contractor will be supplied with one set of A1 paper prints of each of the Drawings.

Any information in the possession of the Contractor that is required by the Engineer's Representative to complete his as-built drawings must be supplied to the Engineer's Representative before a Certificate of Completion will be issued.

Only figured dimensions must be used and Drawings must not be scaled unless required by the Engineer. The Engineer will supply any figured dimensions that may have been omitted from the Drawings.

The levels given on the Structural Drawings are subject to confirmation on the Site and the Contractor shall submit all levels to the Engineer for confirmation before he commences construction of any structure. The Contractor shall also check all clearances given on the Drawings and shall inform the Engineer of discrepancies.

C3.1.11 Power Supply And Other Services

The Contractor must make his own arrangements concerning the supply of electrical power and all other services. No direct payment will be made for the provision of electrical and other services. The cost of providing these services will be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

C3.1.12 Construction In Confined Areas

It may be necessary for the Contractor to work in confined areas. Except in the case of structures, no additional payment will be made for work in "restricted areas" as described in Section 6100 of the Standard Specifications. In certain areas the width of the fill material and pavement layers may reduce to zero and the working space may be confined. The method of construction in these confined areas depends on the Contractor's Construction Plant. However, the Contractor must note that measurement and payment will be in accordance with the specified cross-sections and dimensions, irrespective of the methods used to achieve these cross-sections and dimensions, and that the rates and amounts tendered will be deemed to include full compensation for any special equipment or construction methods or for any difficulty encountered in working in confined areas and narrow widths, and at or around obstructions, and that no extra payment will be made nor will any claim for payment be considered on account of these difficulties.

C3.1.13 Contractor's Site Office And Camp Site

The location of the Contractor's site office and camp site will be subject to the approval of the Engineer.

C3.1.14 Security

The Contractor shall be responsible for the security of his personnel and Construction Plant on and around the Site of the Works and for the security of his camp, and no claims in this regard will be considered by the Employer.

C3.1.15 Water For Construction Purposes

The Contractor must make adequate provision in his tender for all negotiations and procurement of water for construction activities, and all related costs will be deemed to be included in his tendered rates.

C3.1.16 Additional Requirements for Construction Activities

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

(b) Failure to maintain road signs, warning flashing lights, etc, in a good condition shall constitute ample reason for the Engineer to bring the works to a stop until the road signs, etc, have been repaired to his satisfaction.

(c) The Contractor may not commence construction activities before adequate provision has been made to accommodate traffic in accordance with the requirements of this document and the South African Road Traffic Signs Manual (SARTSM – Vol 2, Chapter 13).

(d) The Contractor may not proceed with permanent works before the required offices and laboratories of the Engineer's site personnel have been erected by him. This includes the provision of electricity, sanitary arrangements, potable water and telephone, e-mail and fax facilities. In the event where the Contractor cannot obtain telephone lines timeously from Telkom, a wireless system shall be provided for telephone, e-mail and fax facilities.

C3.1.17 Temporary Latrines

The Contractor shall provide sufficient latrine facilities for the use of his employees. He shall be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the Engineer and the Employer. Latrines shall be positioned within walking distance from wherever employees or labourers are employed on the Works.

Where required, latrines shall be provided at the rate of one for ten persons and where applicable, the Contractor shall make his own arrangements and pay all charges for the removal of sewage.

C3.1.18 Moving Existing Services

Services belonging to any public or private authority, which require moving, shall be dealt with in the manner specified in the project specification.

The drawings show the positions of services determined from observations and measurement but neither the Employer nor the Engineer accepts responsibility neither for the accuracy of the information nor for the omission of any information. The Contractor shall locate and mark the positions of hidden services in advance of construction and take all reasonable steps to protect existing works against damage, which may arise as a result of his operations on the site.

The Contractor will be held responsible for direct or consequential damage to any existing works including any claims which may arise as a result thereof and the cost of repair of any such damage shall be borne by the Contractor unless it is established by the Engineer that the Contractor exercised reasonable care and damage was unavoidable.

The owners and the Engineer shall be notified immediately of any damage done to existing works.

If so, directed by the Engineer the positions of existing works shall be changed by the Contractor to meet the requirements of the proposed work. The cost of such work shall be paid for at the applicable rates set out in the Bill of Quantities or, in the absence of such rates, at rates mutually agreed between the Engineer and the Contractor.

Work required on known services has been tabulated in a services schedule. The schedule must be read in conjunction with the services plans.

All communication by the Contractor with the relevant authorities in connection with services must be directed through the Engineer.

C3.1.19 Training

Technical skills, generic and management skills training shall be provided with the aim of providing locally employed labour with the technical skills required to undertake the work involved in the Contract, and of furthering small contractor development. Particular Project Specifications deals specifically with matters regarding training, and a payment item for that is included.

C3.1.20 Use Of Local Resources

A major objective of this Contract is the optimum practical use of local resources. One of the methods to be adopted to achieve this objective is through the implementation of labour-optimising construction

methods. Labour-optimising construction is defined in Particular Specification of the Project Specifications.

C3.1.21 Labour-Optimising Construction Activities

(a) General

The portions of the Works listed in Subclause (b) below shall, unless otherwise instructed by the Engineer, be constructed under this Contract using labour-optimising construction methods.

In respect of those portions of the Works which are not listed in Subclause (b), the construction methods adopted and Plant used shall be at the discretion of the Contractor, provided always that the construction methods adopted and Plant used by the Contractor are appropriate in respect of the nature of the Works to be executed and the standards to be achieved in terms of the Contract.

(b) Operations to be executed using labour-optimising construction methods

The following portions of the Works shall be executed using labour-optimising construction methods:

(i) Removing and grubbing large trees and tree stumps;

(ii) Excavating for all open drains, concrete structures, and fence posts;

(iii) Backfilling and compacting all excavations;

(iv) Removing oversize material;

(v) Removing existing concrete and masonry work, irrespective of class and type;

(vi) Stone pitching and erosion protection;

(vii) Finishing off cut and fill slopes;

(viii) Finishing the road and road reserve.

C3.1.22 Restrictions On The Use Of Personnel In The Permanent Employ Of The Contractor

(a) The Contractor shall limit the use on the Contract Works of his permanently employed personnel to that of key personnel only (as defined in Part C of the Project Specifications) and shall, subject to the further provisions of the following parts of the Project Specifications

(i) Particular Specification -Provision of the temporary workforce;

(ii) Particular Specification-Provision of structured training;

execute and complete the Works using a temporary workforce employed directly by the Contractor and/or by Subcontractors.

(b) The Engineer may at his discretion, upon receipt of a written and fully motivated application from the Contractor and where he deems the circumstances to warrant, authorise in writing that the Contractor may use in the execution of the Works, workers not being his key personnel but who are in his permanent employ. Without limiting the generality of application of this sub

clause, circumstances which may be considered by the Engineer to warrant the authorization of the use of the Contractor's permanent employees not being key personnel, include:

(i) The unavailability of sufficient numbers of temporary workers and/or Subcontractors to execute the Works, provided always that the Contractor has proven that he has exercised his best endeavours and taken all reasonable actions to recruit sufficient numbers of temporary workers and Subcontractors and has exhausted all reasonable recruitment options

(ii) The unavailability within the temporary worker pool and/or subcontractor sources available to the Contractor in terms of the Contract, of sufficient of the required knowledge and skills necessary for the execution of the Works or specific portions thereof, in cases where the time for completion allowed in the Contract is insufficient to facilitate the creation of the necessary skills through the provision of training as contemplated in this Contract

(iii) Any other circumstances which the Engineer may deem as constituting a warrant.

C3.1.23 Community Liaison And Community Relations

In all dealings with the various communities and workers employed from within the communities, the Contractor shall take due cognisance of the character, culture and circumstances of the communities involved and shall at all times use his best endeavours to avoid the development of disputes and to foster a spirit of co-operation and harmony towards the Contract.

The Contractor shall at all times keep the Engineer fully informed on all matters affecting the Contract and the communities and shall attend all meetings of the Project Co-ordinating Committee as may be reasonably required by the Engineer. All matters concerning the communities shall be discussed and where possible, resolved at such meetings.

Where any resolution of the Project Co-ordinating Committee shall be contrary to the terms and provisions of the Contract, the Contractor shall not give effect to them without a prior written instruction from the Engineer. Where the Contractor is of the opinion that any instruction of the Engineer issued in terms of this clause will result in him incurring additional costs which were not provided for in his tendered rates and prices, and/or that a delay in the progress of the Works will result, he will be entitled to submit a claim in terms of Clause 10.1 of the Conditions of Contract, provided always that the period of twenty-eight (28) days referred to in Clause 10.1 shall be reduced to three (3) normal working days in respect of all claims submitted in terms of this clause.

C3.1.24 Employment of targeted labour under the Expanded Public Works Programme (EPWP)

The Contractor shall be contractually obliged to:

(a) brief EPWP workers on the conditions of employment;
(b) enter into a formal contract of employment with each EPWP worker, which contract will form part of the Employment Agreement;
(c) keep personnel files for all EPWP workers and make copies available to the Employer if and when requested; and
(d) ensure that payments to EPWP workers are made in accordance with Government Notice No. R347.

The rate of pay for persons employed under the Expanded Public Works Programme (EPWP) shall be: as per SAFSEC rate

C3.2 Engineering

C3.2.1 Design

a) The Employer is responsible for the design of the permanent Works as reflected in the Contract Documents unless otherwise stated.
b) The Contractor is responsible for the design of the temporary Works and their compatibility with the permanent Works.
c) The Contractor shall supply all details necessary to assist the Engineer in the compilation of the "As-Built" drawings.

C3.2.2 Employer's Design

The design of the Works was done on behalf of the Employer by professional Consulting Engineers.

C3.2.3 Contractor's Design

Not applicable

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

C3.2.4 Drawings

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

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

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

The Drawings prepared by the Employer for the permanent Works are listed at the back of this volume. The Employer reserves the right to issue amended and/or additional drawings during the Contract.

C3.2.5 Design Procedure

Not applicable.

C3.3 Procurement

C3.3.1 Preferential Procurement

C3.3.1.1 Requirements

Preferential procurement requirements apply as set out in the Preference Schedules of the Sekhukhune District Municipality and in accordance with the resource standard pertaining to targeted procurement.

C3.3.1.2 Resource standard pertaining to targeted procurement

The edition of the document pertaining to the Municipality Supply Chain and Procurement Management, current at the time of close of tender shall apply.

C3.3.2 Subcontracting

C3.3.2.1Scope of mandatory subcontract works

Unless specified elsewhere, the total value of subcontract works shall not exceed 15% of the contract value

C3.3.2.2 Preferred subcontractor's/suppliers

Subject to approval by the Engineer prior to the appointment of the Contractor

C3.3.2.3 Subcontracting procedures

Subject to approval by the Engineer prior to the appointment of the Contractor

C3.3.2.4 Attendance on subcontractors

Subject to approval by the Engineer prior to the appointment of the Contractor

C3.4 Construction

Project Specifications Referring To The Standard Specifications And Additional Specifications

The Standard Specifications SANS 1200 series as approved by the South African Bureau of Standards latest editions as amended, shall apply to this Contract and amendments forming part of the Project Specifications with a prefix PS are those issued by South African Bureau of Standards and additional Specifications as listed.

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

The number of each clause and each payment item in this part of the Project Specifications consists of the prefix B followed by a number corresponding to the number of the relevant clause or payment item in the Standard Specifications and P for the Particular Specification. The number of a new clause or a new payment item which does not form part of a clause or a payment item in the Standard Specifications and which is included here, is also prefixed by PS the relevant Standard specification followed by a new number. The new numbers follow on the last clause or item number used in the relevant section of the Standard Specifications.

C3.4.1 Work Specification

C3.4.1.1 Applicable Standardized Specification

a) The latest edition as at date of tender of the following Standardised Specifications for Civil Engineering Construction as published by the South African Bureau of Standards shall apply.

SANS 1200

A	:	GENERAL
AB	:	ENGINEER'S OFFICE
C	:	SITE CLEARANCE
D	:	EARTHWORKS
DA	:	EARTHWORKS (Small Works)
DB	:	EARTHWORKS (Pipe trenches)
DK	:	GABIONS AND PITCHING
DM	:	EARTHWORKS (Roads and subgrades)
G	:	CONCRETE (Structural)
L	:	MEDIUM-PRESSURE PIPELINES
LB	:	BEDDING (Pipes)
LF	:	ERF CONNECTIONS
ME	:	SUBBASE

Copies of the above listed SANS specifications are not bound into this document but may be purchased by Tenderers at their own cost from :-

SA Bureau of Standards
Private Bag X191
PRETORIA
0001

For all Building Works, the latest edition (1999) of the "Model Preambles for Trades" as recommended and published by the Association of South African Quantity Surveyors shall apply. This Standardised Specification is not bound into this Document but may be purchased by Tenderers from the Master Builders Association, Natal Building Centre, 40 Essex Terrace, Westville (031 - 26670706).

In the event of any discrepancy between the "Model Preambles for Trades" and the SANS 1200 Standardised Specifications or Project Specifications, the SANS 1200 Standardised and Project Specifications shall take precedence.

b) The term “project specification” must be replaced by “scope of works” wherever it appears in these standardized specifications.

C3.4.1.2 National and International Standards

All national and international standards referred to in the above listed specifications apply, including those referred to in any amendments under subclause C3.4.1.4 below.

C3.4.1.3 Variations and additions to the standardized specifications SANS 1200

Variations and additions to the standardized specifications as listed in C3.4.1.1.

PSA	:	GENERAL
PSAB	:	ENGINEER'S OFFICE
PSC	:	SITE CLEARANCE
PSD	:	EARTHWORKS
PSDB	:	EARTHWORKS (Pipe trenches)
PSDK	:	GABIONS AND PITCHING
PSDM	:	EARTHWORKS (Roads and subgrades)
PSG	:	CONCRETE (Structural)
PSL	:	MEDIUM-PRESSURE PIPELINES
PSLB	:	BEDDING (Pipes)
PSLF	:	ERF CONNECTIONS (Water)
PSME	:	SUBBASE
PSLF	:	ERF CONNECTIONS

C3.4.1.4 Particular Specifications

The following Particular Specifications for the works not covered by the SANS 1200 Standardized Specifications are also included hereunder:

PA	:	PIPELINE VALVES
PB	:	DISINFECTION OF PIPELINES
PC	:	PROVISION OF STRUCTURED TRAINING
PD	:	PROVISION OF THE TEMPORARY WORKFORCE
PE	:	HIV/AIDS SPECIFICATION
PF	:	GENERIC LABOUR INTENSIVE SPECIFICATION
PG	:	ENVIRONMENTAL MANAGEMENT PLAN
PHDD	:	HORIZONTAL DIRECTIONAL DRILLING

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS
SANS 1200 A: GENERAL

PSA 1 SCOPE

Replace the content of sub clause 1.1 including the note, with the following:
This specification cover requirements, principles and responsibilities of a general nature which are generally applicable to civil engineering construction and building work contract, as well the requirements for contractor's establishment on the site."

PSA 2 INTERPRETATIONS

PSA 2.3 Definitions (sub clause 2.3)

In the opening phrase between the words "Specification" AND "the following", insert the words "the definitions given in the Conditions of the Contract and".

a. General

"General conditions and Conditions of contract: The General Conditions of the contract, together with the special conditions of contract as applicable. "Specified": As specified in the standardized specifications, the Drawings or the project Specifications. Specifications shall have the corresponding meaning."

b. Measurement and Payment

Replace the definition 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 work, 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. Hard material cubic metre (m^3)

PSA 3 MATERIALS

PSA 3.1 Quality (sub-clause 3.1)

Add the following:

"All manufactured materials supplied shall be new materials unless the contrary is specified. All materials specified in accordance with SABS Specifications shall bear the SABS mark, whether so specified or not.

The Contractor shall arrange for all necessary process control tests for soil properties, density, etc, and concrete cube tests and is responsible for the cost of all testing to ascertain that the materials do comply with the relevant minimum requirements and all such costs shall be deemed to be included in the tendered rates. The cost of acceptance control tests done by the

Engineer, of which the results do not comply with the minimum requirements, shall be for the Contractor's account. The tests must be carried out by an independent laboratory approved by the Engineer.

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

Add the following sub-clauses to Clause 3:

PSA 3.3 Ordering of Materials

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

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

PSA 3.4 Materials Supplied by the Employer

Material designated in the contract documents to be supplied by the Employer shall not be obtained by the Contractor from any other source than from the Employer. Requisitions for materials to be supplied by the Employer shall be submitted timeously by the Contractor in writing and shall be signed by the Contractor or his authorised representative and countersigned by the Engineer.

The Contractor or his authorised representative shall, upon delivery of all such materials, sign a receipt only for such defects and deficiencies as may have been recorder by the Contractor, such material will, expect only for such defects and deficiencies as many have been recorded by the Contractor in writing on the said receipt, be deemed to be in a sound and satisfactory condition and will then be deemed to be his sole responsibility, as such materials has been supplied by the Contractor himself.

The onus shall be entirely on the contractor to ensure that he accepts only sound materials from the employer, and notwithstanding the supply of material on the Site of the Work which, in his option, is unsound, defective or in any way not in compliance with the specifications. The Contractor shall immediately remove such rejected from the site of the works and shall replace them at his own expense, with new and sound materials which are in accordance with the specifications to the satisfaction of the Engineer.

In the event of circumstance arising which necessitate the replacement of any materials which were supplied by the Employer, the Contractor shall, unless otherwise instructed in writing by the Engineer, obtain such replacement materials only from the employer. In such circumstances, the contractor shall be liable to and pay to the Employer, all costs incurred by the Employer in supplying such replacement materials, irrespective of whether the Contractor could have obtained the said replacement materials from another source at lesser cost than the Employer.

The aforesaid shall always apply, provided the Contractor will not be held liable for the costs of replacement by the employer of unsound materials which were not accepted by the Contractor as aforesaid.

PSA 4 PLANT

PSA 4.2 Contractor's Office, Stores and Services (sub-clause 4.2)

Add the following paragraph before the existing first paragraph:

The Contractor's building, sheds and other facilities erected or utilized on the site for the purposes of the Contract shall be fenced off and shall contain all offices, store, workshop, testing laboratories, toilet facilities, etc, as may be required by the Contractor. The facilities shall always be kept in the neat and orderly condition.

No personnel may reside on the Site. Only night watchmen may be on the Site after hours."

Delete "and first-aid services" in the second paragraph and add the following: The Contractor shall provide on the Site and close proximity to the actual locations where the work is being executed, one toilet per 10 workmen , which toilets shall be relocated from time to time as the location of the work being executed changes, so as to ensure that easy access to the toilets is maintained.

The Contractor shall, where applicable, make all necessary arrangements and pay for the removal of night soil."

Neither housing nor shelters are available for the Contractor's employees, and the Contractor shall make his own arrangement to house his employees and transport them to the site.

PSA 5 CONSTRUCTION

PSA 5.1 Survey

PSA 5.1.1 Setting Out of the Works (sub-clause 5.1.1)

Add the following

The Contractor will be required to set out the various sections of the Works in the order that he proposes to undertake the work as per his programme, at least one week prior to commencing work on these sections, to enable the Engineer to check the design proposals in the field and thereafter to make any minor changes which he may deem necessary. Any additional survey work or setting out required as a result of these changes shall be undertaken on a daywork basis."

Setting out of the works is the sole responsibility of the Contractor and shall be done from the layouts given to him. The proposed network pipes must be placed as indicated on the typical drawings away from the erf boundaries. Any discrepancy shall immediately be reported in writing to the Engineer. Any costs or subsequent costs arising from discrepancies, which had not been reported to the Engineer, shall be the sole responsibility of the Contractor.

The Engineer may alter any part of the works to suit local conditions. The Contractor must therefore contact the Engineer immediately after the preliminary setting out of any part of the works before starting with detail setting out, or construction. Only after the Engineer has approved a specific site or part of the works, may the detail setting out and construction commence.

PSA 5.1.2 Preservation and replacement of beacons and pegs subject to Land Survey Act (sub-clause 5.1.2)

Cadastral stand pegs and any other survey or reference pegs indicated on site, and on plan, and/or recorded in writing during any stage of construction of the works remain the responsibility of the Contractor until completion of the works.

These pegs have to be verified before commencement of the works and all disturbed pegs noted in writing and submitted to the Engineer.

Should any pegs be disturbed during the contract by the Contractor, the pegs must be replaced by a registered land surveyor at the Contractor's cost.

On completion of the Contract a letter from a registered Land Surveyor, certifying that all cadastral stand pegs have been checked and found correct, must be submitted to the Engineer. A pay item has been included for this verification of stand pegs.

PSA 5.2 Watching, Barricading, Lighting And Traffic Crossings (Subclause 5.2)

Add the following:

The road crossings of existing bitumen surfaced roads and gravel roads must be done in half widths, while the total traffic is accommodated in the other lane.

Road traffic signs shall comply with the requirements of the "South African Road Traffic Signs Manual" and shall be approved by the Engineer before construction commences

PSA 5.4 Protection of Overhead and Underground Services (sub-clause 5.4)

Add the following sub-clauses.

PSA 5.4.1 Location of existing services

The Contractor shall make the necessary arrangements with the statutory authority (Municipality, Eskom and Telkom) concerned for the timely relocation of all overhead and underground public services. No claim for extension of time will be considered due to any delay to earthworks operations as a result of obstructions caused by existing services.

Any existing manholes which fall within the road formation area shall be reset to the design road levels and be provided with a heavy-duty manhole cover.

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 inference 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 the intends to work. Neither the Employer nor 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 by the use of appropriate methodologies, carefully expose the services at such positions as are agreed to by the Engineer, for the purposes of verifying the exact location and position of the services. Where the expose 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.

a) Known services, anywhere along the entire lengths of their routes, as may reasonably be deduced from the actual locations at which their positions were verified as aforesaid, due cognizance being taken of such deviations in line and level which may reasonably be anticipated, and

b) 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 in regard to (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 cost of providing, holding available on the Site and utilising 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 tendered rates and price included in the Contractor.

Payment to the Contract in respect of exposing services at the positions agree 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 services 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 subclause 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 arrangement for such work to be executed by the owner of the service, or instruct the Contractor to make such arrangements himself.

Should damage occur to any existing services the Contractor shall immediately inform the Engineer, or when this is not possible the relevant authority ans obtain instructions as to who should carry out repairs. In urgent cases, the Contractor shall take appropriate steps to minimise damage to and interruption of the service. No repairs of telecommunication cables or electric power lines and cable shall be attempted by the Contractor.

PSA 5.4.4 Protection of Structures

Where work is carried out in proximity of buildings, tanks or other structures the Contractor shall take the necessary precautions required, including shoring, to ensure the safety of structures that are at risk.

PSA 5.4.5 Hand Tools

The contractor shall provide and maintain all hand tools required for the execution of the Works.

Add the following sub clauses to clause 5

PSA 5.5 Site Meetings

The Contractor or his authorised 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 office on the site. At such monthly meetings, matters such as general progress on the work, quality of work, problems, claims, payments, and safety shall be discussed, but not matters concerning the day to day running of the contract.

PSA 5.6 Engineering Surveys and Investigations

The Engineer may order or conduct testing, surveys, investigations or any other actions for obtaining additional information about the site , or for facilitating services in connection with the execute of any work in terms of the Contract, or for investigating or facilitating the design of the works. Such testing may include but shall not be limited to:

- Testing of Boreholes

- Land Surveys
- Geotechnical Investigations
- Environmental impact assessments
- Provision of OHS specifications"

PSA 6 TOLERANCES

PSA 6.2 Degrees of Accuracy (sub-clause 6.2)

Degree of accuracy II shall be applicable throughout the works unless as specified on the drawings which shall take precedence.

Add the following subclause to clause 6 :

PSA 6.4 Use of Tolerances

No guarantee is given that the full specified tolerance 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 tolerance may deprive him of the full or any use of tolerances 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 authorised, 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 tolerance 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 tolerance allowed, the Engineer may nevertheless, at his sole discretion, accept the work for payment, In such cases no payment shall be made for quantities of work or material in excess of these calculated for the authorised dimensions minus the tolerance allowed, quantities for payment shall be calculated based on the actual dimensions as constructed.

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.1.2 Fixed-Charge And Value-Related Items

The tendered amounts for fixed-charge and value-related items will not be increased, if extension of time for the completion of the works is awarded.

PSA 8.2.1 Fixed–Charge And Value-Related Items

"Payment of fixed charge" will be made as follow:

a) EIGHTY PER CENT (80%) of the sum tendered will be paid when the facilities have been provided and approved:

b) The remaining TWENTY PER CENT (20%) will be paid when the works have been completed, the facilities have been removed and the site of the Contractor's establishment has been cleared and cleaned to the satisfaction of the Engineer.

No adjustment will be made to the sum tendered 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 tender.

No value related payments shall be applicable.

PSA 8.2.2 Time-Related Items

The tendered amount for a time-related item will be increased; if an extension of time for the completion of the works is awarded on the condition that the activity related to the item tendered for must be sustained during the extended period.

The ratio between the increased amount for a time-related item and the tendered amount must be the same as the ratio between the extension of the time period for the completion of the works and the original time period allowed for completion of the works.

If the works is completed before the end of the original time period allowed for completion of the works, the tendered amount of a time related item that is influenced by the earlier completion would be reduced similarly.

Subject to the provisions of sub clauses 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 diving the sum tendered for the item by the tendered contract period in months, provided always that the total of the monthly amount so paid for the item is out of proportion to the value of the progress of the work as a whole.

PSA 8.2.5 Adjusted Payment for Time-related Items

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

Extended contract period as

Sum of Tendered amounts for time- X authorised by variation order

related items Tendered contract period

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

PSA 8.3.2 Facilities for the Engineer

Add the following to 8.3.2.1

d) Supply of computer and ancillary equipment Unit: Sum

The Contractor shall, for the duration of the contract, provide one desktop computer complete together with the software specified hereunder, for the exclusive use of the Engineer and his staff

- 1 Computer (i5 or similar)
- 1 A3 Inkjet Printer
- 1 A4 Scanner
- Internet connectivity

All Computer hardware shall be provided complete with the requisite connecting cables and all interfacing devices and software necessary for its efficient operation as an integral system.

The following software shall be properly installed on the computer and original licence agreements and disk shall be provided to the Engineer for safekeeping:

- Microsoft Windows 11 or later compatible
- MS Office suite

The tendered sum for each item shall include full compensation for cost related to the above item.

All Computer equipment provide shall kept fully serviceable at all the times by the Contractor. The Contractor shall have any defective equipment repaired or replaced at his own cost within 12 hours after notification by the Engineer's staff.

The Contractor shall further provide at his own cost, all the paper and black toner cartridges and consumable reasonably required by the Engineer.

PSA 8.3 Scheduled Fixed-Charge and Value-Related Items

PS A 8.3.3 Other Fixed-Charge Obligations

This item as listed under Section 1 of the bill of quantities is as specified in the standardised specification SABS 1200 A.

PSA 8.4 Scheduled Time Related Items

PSA 8.4.5 Testing (Sub clause 8.4.5)

Add the following:

The cost of all sampling and testing executed by the Contractor or approved laboratory must be included in the amount for other time related items and no separate payment shall be made for this. This condition also relates to the placing, curing and testing of concrete cubes.

PSA 8.5 Sums Stated provisionally by the Engineer (Sub clause 8.5)

Add the following:

PSA 8.5.1 Testing

A provisional sum is allowed for testing of soils and materials by the Engineer, and the cost of transporting samples to the testing laboratory. It should be noted that this is completely unconnected with the general testing of materials in accordance with clause 7 of the standardized specifications, for which the Contractor is solely responsible, and the cost of which is included in the scheduled rates.

The cost of all sampling and testing executed by the Contractor or approved laboratory must be included in the amount for other time related items and no separate payment shall be made for this. This condition also relates to the placing, curing and testing of concrete cubes.

PSA 8.5.2 Surveys, Investigations, assessments, specifications and services:

a) OHS Specification .....Unit: Provisional Sum

Contractor's handling costs, profit and all other charges in respect of subitems PSA 8.5.2 (a)

b) OHS Specification ..... Unit : Percentage (%)

Payment under subitems PSA 8.5.2(a) shall be the amounts actually paid and shall be made in accordance with the provisions of the General Conditions of the contract.

The percentage tendered for subitem PSA 8.5.2 (b) shall be the percentages of the amount actually reimbursed to the contractor under subitem PSA 8.5.2.(a) and shall be full and final compensation in respect of the Contractor's handling costs, profit, mentoring , record keeping, reporting and all other charges in connection with providing the services

PSA 8.6 Prime Cost Items (sub clause 8.6)

Replace subclause 8.6 with the following:

PSA 8.6.1 Prime Cost Sums

a) Description of item to which Prime Cost Sum applies .....Unit : PC Sum

b) Charge required by the Contractor on subitem above .....Unit %

Subitems(a) and (b) will be provided in the Schedule of Quantities for each different item to which a Prime Cost Sum applies.

The Contractor shall be reimbursed under subitem(s) (a) in substitution of the respective Prime Cost Sums included in the contract, the actual price(s) paid or payable by him in respect of the goods, material or services supplied, but excluding any charges of the Contractor's labour, profit, carriage, establishment or other charges related to such goods, services or materials.

The Contractor shall be paid under subitem (b), the respective percentage, as stated the Contractor in his tender, of the amount certified by the Engineer for payment under the related subitem (a). The percentages tendered by the Contractor for each respective subitem(b) included in the Schedule of Quantities shall be deemed to be in full and final compensation to the contractor in respect of any charge by the Contractor for labour , carriage profit, establishment and for any other charges related to the goods , services or materials supplied under related subitem (a).

If the Contractor shall have omitted within his tender to insert a tendered percentage under subitem(b) or tendered a zero percentage, the Contractor's tendered rate for subitem(b) shall be deemed to be zero and the Contractor shall not be entitled to any payment under subitem (b)

PSA 8.7 Dayworks (Sub clause 8.7)

Replace the last contents of subclause 8.7 with the following:

"Measurement and payment shall be in accordance with the provisions of sub clause 37(2) of the General Conditions of Contract

PSA 8.8 Temporary Works

PSA 8.8.2 Accommodation of Traffic (Sub clause 8.8.2)

Add the following:

The rate shall cover all costs pertaining to the provision, erection, moving, re-erection and maintenance of all temporary barricades, road signs, lights, flagmen, etc. as required, for the guarding and protection of the works, for the construction, gravelling and maintenance of access roads and detours to the site of the works, borrow pits or spoil sites, as well as for the later removal or the cleaning and tidying up thereof. This rate shall also cover all costs to facilitate construction activities related to working in half width where required at road crossings.

PSA 8.8.4 Existing Services (sub-clause 8.8.4)

In the related sections of the Schedule of Quantities, rates are to be listed for the detection and exposing of existing services.

Hand excavate in all materials for the detection of existing services per specified depth category. (Category to be stated) …….Unit: m3

These rates shall cover all costs including time and machinery (if necessary) involved in the detection of existing services and different depth classifications. The rate shall cover the Contractor's costs of excavating by hand in all materials to expose or locate existing services and shall include the backfilling and compaction thereof.

Add the following to sub clauses 8.8

PSA 8.8.7 Setting Out of the Works

The costs for the setting out of the works and level control shall be deemed to be covered by the rate for the particular item.

The Contractor shall set out the works in accordance with the drawings

PSA 8.8.8 Compliance with OHS Act and Regulations including the construction regulations 2003

.....Unit: Sum

The tendered sum shall include full compensation to the Contractor for compliance with all the requirements of the OHS Act and Regulations (including the Construction Regulations 2003) all times for the full duration of the Contract, as described in the Project Specifications. The successful tenderer shall provide the Engineer with the complete breakdown of this tendered sum.

This sum will be paid to the Contractor in equal monthly amount subject to proper/ substantial compliance.

PSA 8.8.9 Compliance with Environmental Management Plan

.....Unit: Sum

The tendered sum shall include full compensation to the Contractor for compliance with all the requirements of the Environmental Management Plan at all times for the full duration of the Contract, as described in the Project Specifications. The successful tenderer shall provide the Engineer with the complete breakdown of this tendered sum.

This sum will be paid to the Contractor in equal monthly amount subject to proper/ substantial compliance.

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS

SANS 1200 AB: ENGINEERS OFFICE

PSAB 3 MATERIALS

PSAB 3.1 Nameboards (sub-clause 3.1)

The Contractor shall supply, erect where directed, maintain and remove on completion (1 No.) project name board of substantial construction, with the project description, and names of the Employer, Engineer and Contractor printed on, in accordance with the Engineer's detail or as approved. The board shall be mounted 3m above the ground level on two steel supports or suitable gumpoles firmly set in the ground.

PSAB 3.2 Office Buildings (sub-clause 3.2)

Office space for the Engineer or his representative is required. The Contractor must allow for an office for the Resident Engineer whose office must be accessible to the Engineer or his representative. The office shall have 2 windows and a minimum floor space of 12m2. Furniture required is a desk of 1.2m2, three chairs, a plan table of 2m2 and at least one lock-up cabinet for the Engineer or his representative.

The office shall be equipped with a suitable air conditioning unit and be well insulated.

PSAB 4 PLANT

Add the following clause:

PSAB 4.2 Survey Equipment

The Contractor shall provide the following survey equipment on the Site from commencement to the completion of the Works if required:

1x automatic reading dumpy level plus tripod;

1x levelling staff (5 m long, 1 cm gradations);

1x staff angle bubble;

1x metal change-point for levelling;

1x spirit level (1 m long);

4x steel tipped ranging rods each 2.5 m long;

1x hammer (2 kg);

1x 100 m steel tape;

A supply of at least 20x, 500 mm (long) x 8 mm (diameter) steel pegs at all times

The survey equipment shall be shared by arrangement between the Contractor and the Engineer or his representative on Site. The Contractor shall keep the equipment continuously insured against any loss, damage, or breakage and he shall indemnify the Engineer and the Employer against any claim in this regard. Upon completion of the Works the survey equipment as listed above shall revert to the Contractor.

PSAB 5 CONSTRUCTION

PSAB 5.5 Survey Assistants (sub-clause 5.5)

The Contractor shall at all times make available to the Engineer two suitably trained labourers for use on and about the site on survey and other work as directed by the Engineer at all reasonable times.

PSAB 8 MEASUREMENT AND PAYMENT

Add the following

PSAB 8.2 Survey Assistance and Equipment …….Unit : Sum

The rate shall cover all fixed and time-related costs pertaining to the survey assistants and equipment as prescribed in PSAB 5.5.

PSAB 8.3 Provisional Sum for costs of cellular calls and other related charges. …….Unit: Prov. Sum

PSAB 8.4 Handling costs and profit in respect of sub-item PSAB 8.3 …….Unit: %

Measurement and payment in respect of the provisional sum item shall be made in accordance with the provisions of the General Conditions of Contract.

The tendered percentage is a percentage of the amount actually spent under item PSAB 8.3, which shall include full compensation for the handling costs of the Contractor, and the profit in connection with the payment of the costs of calls and other charges relating to the use by the Engineer's site staff.

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS

SANS 1200 C: SITE CLEARANCE

PSC 3 MATERIAL

PSC 3.1 DISPOSAL OF MATERIAL

Substitute the first sentence of 3.1 with the following:

Material obtained from clearing and grubbing shall be disposed of at a suitable site approved by the Engineer. The Contractor shall obtain his own dumping site for the disposal of material and all transport costs shall be included in the rates for site clearance.

No overhaul will be paid for any spoil materials from the "clear and grubbing" operation. All costs relating to this activity shall be deemed to be included in the rates tendered for site clearance.

PSC 5 CONSTRUCTION

PSC 5.1 AREAS TO BE CLEARED AND GRUBBED

Substitute the first sentence of 5.1 with the following:

Unless otherwise indicated by the Engineer, clearing and grubbing are limited to be cleared to a distance of 1.5m on both sides of the pipeline centre line or a width as indicated on the applicable drawing along the designated route.

An area 2.0m wider on all sides of reservoirs and pump stations shall be cleared

Measurement and payment for clearing and grubbing shall only occur for areas as required in writing by the Engineer. Such works shall be undertaken in compliance with Environmental report.

Route pegs or markers shall not be destroyed or damaged during clearing operations.

The Contractor may proceed with clearing and grubbing after the handing over of the site.

PSC 5.2 Cutting of Trees

PSC 5.2.3.2 Individual trees (sub clause 5.2.3.2)

Add the following:

Trees outside the pipe route or road prism must be left standing and undamaged, except where otherwise ordered in writing by the Engineer. Those trees falling within the designated area for clear and grubbing may only be removed on instruction of the Engineer. Such works shall be undertaken in compliance with Environmental report

A penalty of R2 500,00 per tree for trees damaged and/or removed will be charged.

PSC 5.5 Reclearing of Vegetation (sub clause 5.5)

Add the following

When areas have to be recleared on the written instructions of the Engineer, such reclearing shall be carried out at the Contractor's own cost and the Contractor is therefore advised not to clear the areas too soon.

Add the follow sub clause to clause 5

PSC 5.9 Existing Fencing

The fencing parallel to the proposed route must be maintained and repaired where it was damaged. The fencing must only be removed and re0erected at the positions indicated and approved by the Engineer. When the pipeline crosses fencing or gates, temporary wire gates must be provided that must be kept closed.

PSC 8 MEASUREMENT AND PAYMENT

PSC 8.1 Basic Principals

Add the following:

No separate item will be made for removal of topsoil along the pipe routes or road prism. The contractor is to excavate in such a manner that the top 100mm of materials is kept separate from other excavations for replacement upon completion of the backfill operations or finishing of the road prism. All costs related to the excavation of this topsoil shall be deemed to be included in the tendered rates for the related excavation works.

PSC 8.2 Scheduled Items

PSC 8.2.1 Clear and Grub

Replace the first line with the following:

The area designated by the Engineer to be cleared and grubbed will be the nearest square metre or hectare

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS

SANS 1200 D: EARTHWORKS

PSD 2 DEFINITIONS

Replace the definition "Borrow" with the following:

"Borrow Material: Materials, other than materials obtained from excavations required for the works, obtained from sources such as borrow pits or the authorized widening of cuttings".

PSD 3 MATERIALS

PSD 3.1.2 Classes of Excavation (Sub clause 3.1.2)

The classification of material other than "soft excavation" shall be agreed upon before excavation may commence.

The Contractor shall immediately inform the Engineer if and when the nature of the material being excavated changes to such an extent that a new classification is warranted for further excavation. Failure on the part of the Contractor to advise the Engineer in good time shall entitle the Engineer or reclassify, at his discretion, such excavated material.

"Boulder excavation Classes A and B" shall not apply, irrespective of the construction method used. Boulder excavation will be classified on site by the Engineer, as either "Intermediate" or "Hard rock" excavation.

PSD 3.2.3 Materials Suitable for Backfill or Fill against Structures. (Sub clause 3.2.3)

Replace the contents of this sub clause with the following:

"Material used for backfill behind structures shall generally be the material excavated, subject to the following conditions:

a) The materials shall not contain an excessive number of stones retained on the 50mm sieve

b) The materials shall not contain large clay lumps that do not break uo under the action of the compaction equipment; and

c) The liquid limit of the material shall not exceed 40, neither shall the PI exceed 18"

PSD 3.3 Selection

PSD 3.3.1 General (sub clause 3.3.1)

Substitute the second paragraph with the following:

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

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

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

PSD 5 CONSTRUCTION

PSD 5.1 Precautions

PSD 5.1.1 Safety

PSD 5.1.1.1 Barricading and lighting (sub clause 5.1.1.1)

Replace "Machinery and Occupational Safety Act, 1983 (Act 6 of 1983)" with "Occupational Health and Safety Act, 1993 (Act 85 of 1993)"

PSD 5.1.1.2 Safeguarding of excavations (sub clause 5.1.1.2)

Replace "Machinery and Occupational Safety Act, 1983 (Act 6 of 1983)" with "Occupational Health and Safety Act, 1993 (Act 85 of 1993)"

PSD 5.1.1.3 Explosives (sub clause 5.1.1.3)

Replace the contents of this subclause with the following:

The Contractor will generally be permitted to use explosives for breaking up hard material during excavations, for demolishing existing structures and for other purposes where explosives are normally required, subject to the following conditions.

The Engineer may prohibit the use of explosives in cases where, in his option, the risk of injury to persons or damage to property or to adjoining structures is too high.

Such action by the Engineer does not entitle the Contractor to additional payment for having to resort to less economical methods of construction

a) The Engineer 's prior written approval shall be obtained for each and every blasting operation. This approval may be withheld if the Contractor does not use explosives responsibly and carefully.

b) The Contractor shall comply fully with the requirements of the Explosives Act, 1997 (Act No 83 of 1997) and all other legislation and regulations as may be applicable to blasting and use of explosives.

c) Before blasting is undertaken, the Contractor shall satisfy the Engineer that he has established whether or not the insurers concerned require pre and post blasting inspections of buildings and structures within certain radius of proposed blasting.

d) Should such inspections be required , the contractor shall together with the Engineer and the insurer, examine and measure the buildings, houses or structures in the vicinity of the proposed

blasting site and establish and record together with the owner, lessee or occupier, the extent of any existing cracking or damage before blasting operations commence.

e) When there is possibility of damage to power and telephone lines or any other services or property, the Contractor shall adapt his method of blasting and the size of the charges and shall use adequate protective measures (eg cover blasting) to reduce the risk of damage.

f) All accidents, injury to persons and animals and damage to property shall be reported to the Engineer in detail and in writing as soon as is practicable.

g) The Engineer shall be given 24 Hours' notice by the Contractor before each blasting operation is carried out.

h) When the blasting to specified profiles, the Contractor shall so arrange the holes and charges that the resulting exposed surfaces are as the nature of the material permits. The Contractor shall make good at his own expense, any additional excavation necessitated by the shattering of rock in excess of any overbreak allowance specified in the Project Specifications or given on any Drawing.

Notwithstanding the Contractor's compliance with the above provisions, the Contractor shall remain liable for any injury to persons and animals and loss of or damage to property occurring as a result of blasting operations.

PSD 5.1.2 Existing services

PSD 5.1.2.2 Detection, location and exposure (sub clause 5.1.2.2)

Add the following to:

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

A minimum of three trial cross trenches per street block must be excavated by hand perpendicular to the pipeline route to establish the position of existing services and the final portion of the network pipeline.

All services must be located and opened for inspection by the Engineer before commencing trench excavation. Any costs or losses suffered by the Contractor as a result of not abiding by this specification will be for the Contractor's account.

PSD 5.1.3 Stormwater and Groundwater (sub clause 5.1.3)

Add the following:

The Contractor shall, where applicable and at the earliest practicable opportunity, install the permanent drainage specified or shown on the Drawings and shall at his own cost provide the temporary drainage required to protect the works.

PSD 5.1.4.1 Dust Nuisance (sub clause 5.1.4.1)

Add the following:

The Contractor is responsible for dust control and is liable for all claims that may result from dust nuisance on all parts of the site and at all times from the date of handing over of the site to the completion date of the contract. No payment regarding the above-mentioned will be made and all costs shall be deemed to be covered by the tendered rates.

PSD 5.1.6 Road Traffic Control (sub clause 5.1.6)

Add the following:

a) Sufficient road signs must be erected in such a way that motorists will be warned in time of works, eg. at the closing of a street sufficient signs to direct traffic must be erected at the preceding intersection.

b) Bypasses and/or road signs shall be provided and/or erected at all locations where the free flow of traffic is obstructed and shall be approved by the Engineer before the commencement of construction. Where main roads are crossed, detours and temporary traffic signs must be provided as shown on the attached drawings.

c) Where a trench crosses a street or any place where a trench crosses the direction of traffic flow, drums must be placed in the street and not just along the sides of the street with danger tape in between.

d) Danger tape must be put up between drums and tied around the drums.

e) Drums may not be filled with stones. The spacing of drums must be in such a way (maximum 5 m) that they are visible from all directions.

f) Sufficient safety measures must be utilised for pedestrians.

g) Vehicular and pedestrian access must be maintained to all stands, businesses, etc at all times.

The Contractor's attention is drawn to the fact that pipelines must be constructed under main roads and access roads. The Contractor must arrange his work in such an order to assure free flow of traffic. No additional payment for any discomfort, extra costs, or delaying as a result of the provision of this facility will be made except for the item as allowed under PSA 8.8.2

PSD 5.2 Methods and Procedures

PSD 5.2.2 Excavation (sub clause 5.2.2)

Add the following:

Hand Excavation

The Engineer may order that excavation be done by hand, using shovels only, in the vicinity of underground services. A special item for such hand excavation has been measured in the Bill of Quantities.

PSD 5.2.2.1 Excavation for General Earthworks and for structures (sub clause 5.2.2.1)

Add the following:

The contractor shall be required to provide working space around all structures. The excavation, backfilling and compaction of this materials shall be deemed to be included in the tendered rates for particular the structure.

PSD 5.2.2.2 Borrow Pits (sub clause 5.2.2.2)

Add the following

The contractor must construct and maintain at his own cost the necessary access roads and borrow pits. The position of borrow pits must be approved by the Engineer before opening up the borrow pits.

It is to be noted that no extra over payment will be affected for intermediate or hard rock excavations on materials obtained from borrow pits and commercial off-site sources. The contractor is to allow for this in his rates.

PSD 5.2.2.3 Disposal (sub clause 5.2.2.3)

Substitute the second sentence with the following:

All surplus and unsuitable material shall be dumped and neatly finished off in the area pointed out by the Engineer within the freehaul distance.

PSD 5.2.5 Transport of earthworks

PSD5.2.5.1 Freehaul (sub clause 5.2.5.1)

Add the following:

The transport of all excavated materials, irrespective of the distance and source, shall be deemed to be freehaul, the costs of which is included in the Contractor's tendered rates and prices for the excavation of the materials. No separate compensation shall apply for the transportation of excavated materials.

Free haul of material on site from borrow pit areas, as well as to dumping areas within 10km will be regarded as freehaul. This freehaul distance is applicable to the whole of the contract.

PSD 8.3 Scheduled Items

PSD 8.3.3 Restricted excavation

The excavation of valve chambers, stand posts etc. Is not measured separately and is included in the tariff of the chambers.

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS

SABS 1200 DB: EARTHWORKS (PIPE TRENCHES)

PSDB 3 MATERIALS

PSDB 3.1 Classes of Excavation (Sub clause 3.1)

Substitute 3.1 the following:

The Engineer shall classify excavated materials as Soft excavation. Rock will be measured individually as an extra-over items.

TABLE 1: CLASSIFICATION OF MATERIALS

CLASSIFICATION	DESCRIPTION
Soft	All materials other than rock
Rock	Material which cannot be economically fragmented and loosened for removal by hand implements and pneumatic tools, except by drilling and blasting or the use of rock breaking equipment.

In the first instance, the classification shall be based on the descriptions given in Table 1. In the event of disagreement between the Contractor and the Engineer, the Engineer shall reclassify the material in accordance with relevant specifications and without being unreasonable to the Contractor. The decision of the Engineer on the classification shall then, subject to the provisions of the Contract, be final and binding.

The Contractor shall notify the Engineer of the presence of what he considers to be rock immediately upon discovery thereof. The Engineer will inspect the material and decide whether or not it warrants the use of pneumatic tools or rock breaking equipment. In the case of isolated boulders set in a soil matrix, the Engineer may order the Contractor to either widen the excavation and roll the boulders sideways or lift the boulders out from the trenches.

In the event that the Engineer decides that the use of pneumatic tools, rock breaking equipment, or blasting is necessary, he will classify the material accordingly and arrange for the quantity thereof to be measured. The Contractor will supply the necessary pneumatic equipment and arrange for others to break up rock into manageable pieces.

PSDB 3.5 Backfill Materials

a) Substitute "from trenches" in 3.5 (a) with "from trenches and street excavations".

Add the following to 3.5(c):

c) Road crossings, access to services, farms and camps and any section that fall within the road prism shall be classified as areas subject to loads from road traffic and must be compacted accordingly to the top of the trench (natural ground level).

Add the following paragraph to sub clause 3.5

d) Cement – Stabilized Backfilling

Backfilling shall, where directed by the Engineer, be stabilized with 5% cement. The aggregate shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.

The soil or gravel shall be mixed with 5% cement and shall be compacted in layers of 100 mm thick to 90% of modified AASHTO density.

e) Solicrete Backfilling

The aggregate for soilcrete shall be mixed with 5% cement and shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.

The soil or gravel shall be mixed in a concrete mixer with the cement and enough water to acquire a consistency that allows the mixture to be placed with vibrators to fill all voids between the pipe and the sides of the trench. Shuttering shall be used where necessary.

PSDB 3.6 Materials for Reinstatement of Roads and Paved Areas (Sub clause 3.6)

Add the following:

PSDB 3.6.5 Slurry

a) Aggregate for Slurry

The aggregate for slurry shall be approved crusher sand obtained from a parent rock having an ACV not exceeding 30 or a mixture of crusher sand and clean natural sand, where the mixture does not contain more than 25% of natural sand. The aggregate shall be clean, tough, durable, angular in shape, and shall conform to the following grading requirements**:**

Table: Aggregate Slurry

Sieve Size (mm)	Percentage by Mass Passing	
	Fine Grade	Medium Grade
6,700		100
4,750	100	82-100
2,360	90-100	56095
1,180	65-95	37-75

0,600	42-72	22-50
0,230	23-48	15-37
0,150	10-27	7-20
0,075	4-12	4-12

b) Cement Filler for Slurry

CEM 1 (Portland cement shall be used

c) Bitumen Emulsions

SS 60 anionic/cationic emulsion shall be used

d) Slurry Mix

The composition of slurry shall be based on the following mass proportions:

i)	Slurry aggregate (dry)	:	100 parts	(1m3)
ii)	Stable grade emulsion	:	16 parts	(260 l)
iii)	Cement	:	1,5 parts	(0,01m3)
iv)	Water	:	+/- 15 parts	(approx. 235l)

The volume of water in the slurry mix, shall be such that the consistency of the slurry is between 30mm and 40mm when measured in accordance with the test method (Appendix G in TRH3-1998)

PSDB 3.7 Selection

Replace the words "If he so wishes: in the first line of the second paragraph with the words "at his own cost"

If the excavation of a pipeline damages an existing road surface, the Contractor must stockpile material from the top 200mm of such a road surface in order to reuse it as sub base for the repairing of the road crossing.

If necessary gravel material that is suitable for the reparation of road surfaces must be imported.

The Contractor must make provision in his tariffs for compaction in road reserves for the selection of excavated material as specified above.

PSDB 4 PLANT

PSDB 4.1 Excavation Equipment (Sub clause 4.1)

Add the following:

An adequate number of suitable tools, including hand stampers, wheelbarrows and hosepipes shall be provided by the Contractor. The Contractor will supply mechanical compaction equipment and when required pneumatic and rock breaking equipment.

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

PSDB 5 CONSTRUCTION

PSDB 5.1 Precautions

PSDB 5.1.2.2 Special Water Hazards (Sub clause 5.1.2.2)

Add the following:

Water in Trenches

Water in pipe trenches may cause movement of the pipes as a result of flotation and backfilling must therefore be executed as quickly as possible. If movement of the pipes does occur the contractor must, unless otherwise instructed by the Engineer, remove the pipes from the trench and reinstall it at his own expense.

No provision has been made in the Schedule of Quantities for separate payment for dealing with water. The unit rate for excavation shall cover the cost of dealing with water in the excavations.

PSDB 5.1.3 Accommodation of Traffic and Access to Properties (Sub clause 5.1.3)

Replace the semicolon and the word "and" at the end of sub clause 5.1.3(a) with a full stop and replace item (b) with the following:

Where necessary to achieve compliance by the Contractor with his obligations in terms of the Project Specifications to provide and maintain pedestrian and vehicular access to properties affected by the works, the Contractor shall construct and maintain to the satisfaction of the Engineer, such temporary access roads around and /or steel or timber bridges over excavations in roads, pavements, entrances or accesses to properties.

Temporary pedestrian access bridges shall be at least 1,2 m wide and temporary access bridges for vehicles shall be at least 3,6 m wide. All temporary access bridges shall be fitted with handrails as well as protective mesh fencing on both sides.

On Completion of the work, the contractor shall dismantle and remove all such temporary constructions and reinstate these areas to their former condition.

Except only where the Engineer has included in the schedule of Quantities, particular payment items specifically therefore, the contractor will not be paid directly for the construction and maintenance of temporary access roads and/ or the provision and maintenance of bridges as aforementioned, and the costs thereof shall be deemed included in the Contractor's bid rates of excavation.

PSDB 5.2 Minimum Base Widths (sub clause 5.2)

Replace paragraph (a) with the following

Where two pipes are placed in the same trench, they shall be 300 mm apart and the specified side allowance shall still be applicable except where stated to the drawings which shall take president.

Replace paragraph (b) with the following

i. The minimum base width of external diameter for flexible piping laid at a depth not exceeding 1.5 m will be:

External diameter of pipe barrel, mm		Trench Width (mm)
Over	Up to and including	
-	50	300
50	315	600

ii. The minimum base width of external diameter for flexible piping laid at a depth exceeding 1.5 m up to and including 2.5m will be:

External diameter of pipe barrel, mm		Trench Width (mm)
Over	Up to and including	
-	315	750

Add the following after paragraph (b):

Trenches for subsurface drain shall be excavated to the dimensions and gradients shown on the Drawing or directed by the Engineer.

The specification width of trenches and the width of the excavation measured for payment shall not be less than 0.3 m, but the Contractor may reduce the actual width with the Engineer's permission.

PSDB 5.4 Excavation (sub clause 5.4)

Add the following:

Excavation and backfilling of pipe trenches on sidewalks in the residential area shall be done in such a manner as to ensure the least possible disruption to the public and access to the properties. No additional payment shall be made for this and all relevant costs shall be deemed to be included in the tendered rates.

PSDB 5.5 Trench Bottom (sub clause 5.5)

Substitute "90 %" in the second paragraph of 5.5 with "93 % ".

Add the following:

Where pipe trenches are excavated deeper than specified or shown on the drawings, these excavations must be backfilled with suitable approved selected material in layers of not more than 150mm uncompacted thickness and must be compacted to the thickness of the adjoining in-situ material or as prescribed by the Engineer.

PSDB 5.6 Backfilling

PSDB 5.6.1 General (sub clause 5.6.1)

Backfilling in road reserves must be compacted in 100mm layers up to natural ground level.

Where prescribed by the Engineer all surplus material must be neatly piled over the real trench width to a height not more than 150mm higher than the adjoining level.

PSDB 5.6.3 Disposal of Soft Excavation Material (sub clause 5.6.3)

Add the following:

All surplus and unsuitable material as described in DB 5.6.3 shall be disposed of at the spoil site, as described in PSD 5.2.2.3 and levelled.

The disposal of surplus excavation will not be confined to the trench servitude. The Engineer may order the Contractor to dispose of surplus material elsewhere on the site, within the haul free

distance. All costs related thereto must be included in the contractor's rates as scheduled under item 8.2.2 & 8.2.3 SABS 1200 DB.

PSDB 5.7 Compaction

PSDB 5.7.2 Areas Subject To Traffic Loads (sub clause 5.7.2)

Add the following:

All pipe trenches within road crossings, accesses to services, farms and camps that fall within the road reserve, will be regarded as areas subject to traffic loads. Backfilling of trenches that are subject to traffic loads will be executed as follows:

Main backfill up to road layers	:	90% mod AASHTO
Selected backfill material (150mm)	:	93% mod AASHTO G7 quality
Sub base (150mm) stabilized with	:	95% mod AASHTO G6 quality
3% Portland cement		
Base (150mm)	:	98% mod AASHTO G3 quality.
Asphalt Surface Treatment	:	30mm Continuously graded
Slurry Seal Surface Treatment	:	applied at a rate of 200m2/m3

PSDB 5.9 Reinstatement of Surface

PSDB 5.9.2 Private Property and Commonage (sub clause 5.9.2)

Add the following to DB 5.9.2:

Gardens and lawns shall be repaired to the original standard where they were crossed. Grass and plants shall be taken out of the ground, temporarily stocked, watered during construction, and replanted after backfilling.

Add the following sub clauses

PSDB 5.9.7 Preparation for Excavation on Roads with Surface Seal

Before commencement of trench excavation on surface sealed roads the excavation shall be prepared by facilitating a saw cut edge (Depth 75mm) to the width dimensions of the trench to be excavated

Add the following clauses

PSDB 5.11 Labour intensive excavations and backfilling

All excavations must be labour intensive where possible and local labour must be hired for this purpose. Provision for machine rates have been made in the list of quantities and must be priced accordingly. All backfilling regardless of whether excavation was done by hand or machine, will be

done by hand. Mechanical compaction equipment must however be used to obtain the required compaction. (See Conditions of Tender in relevant paragraphs).

PSDB 5.12 Excavation Restrictions and Payment

A maximum length of 500m of open trench only will be allowed on the project, conditional that it is continuous. Under no circumstances will leap frogging of trenches be allowed unless written permission is granted by the engineer.

PSDB 5.13 Shoring

No item has been scheduled for shoring or other safety precautionary measures for working in trenches. This must be allowed for in the contractor's rates as scheduled under item 8.3.2 & 8.3.3 SABS 1200 DB.

PSDB 8 MEASUREMENT AND PAYMENT

PSDB 8.2 Computation of Quantities

PSDB 8.2.4 Shoring (sub clause 8.2.4)

Add the following to:

The rate for shoring shall be deemed to be measured and paid under the respective excavation rate for pipe trenches.

PSDB 8.3 Scheduled Items

PSDB 8.3.2 Excavation (sub clause 8.3.2)

PSDB 8.3.2 (a) Excavate in all materials for trenches, backfill, compact and dispose of surplus material Unit : m3

Replace “of 1,0 m” In the first sentence of 8.3.2(a) with:

As specified in the schedule of quantities.

Add the following to DB 8.3.2 (a):

The depth of excavation in street reserves shall be measured from the final finished level.

In cases where services lie parallel to steep slopes, the depth of the excavation will be measured along the centre of the trench (on the route of the service).

Trench base widths will be in accordance with PSDB 5.2

b) Extra over items (a) above for:

Add the following to 8.3.2(b)2:

The extra over rate shall include where blasting occurs for the exposing of the rock, backfilling prior to blasting and excavation of the trench again to the required depth and level.

Add the following at the end of the existing subitem 2

No payment will be made under subitems (1) and (2) in respect of any materials measured and paid for under subitems 3 below.

Add the following new subitems in 8.3.2(b)

3. Hand excavation where ordered by the Engineer in:

Soft Material Unit : m3

Hard Material Unit : m3

The unit of measurement shall be the cubic metre of material, measured in place according to the authorised dimensions, which was excavated by hand on the specific prior written instructions of the Engineer, provided always that the Engineer's said instruction shall have stated that measurement and payment for such hand excavation will be in accordance with this item.

The bid rate shall include full compensation for the additional cost, effort and time resulting from excavating in the respective materials using hand methods only.

The Engineer shall not be obliged to authorise payment under this item in respect of any hand excavation carried out (whether ordered in writing or otherwise),which hand excavation was in any case necessary to achieve compliance by the Contractor with his obligations under the Contract to:

- Utilise construction appropriate to the nature of the specific parts of the works and/or
- Protect existing structures and/or services and /or
- Comply with all prevailing legislation and regulations

4. Backfill stabilized with 5% cement where directed by the Engineer …… .Unit : m3

The unit of measurement shall be the cubic metre of backfill material, measure in place after compaction according to the authorised dimensions, which was stabilized on the Engineer's instructions in accordance with subclause PSDB 3.5(c)

The bid rate shall include full compensation for supply the cement and for selecting, mixing, backfilling and compacting the stabilized material to 90% of modified AASHTO density.

5. Soilcrete backfill where directed by the Engineer ……..……Unit : m3

The unit of measurement shall be the cubic metre of soilcrete placed on the Engineer's instructions in accordance with subclause PSDB 3.5 (d), measure in place according to the authorised dimensions.

The bid rate shall include full compensation for supplying the cement and for selecting, mixing and placing the soilcrete as well as for the cost of shuttering if required.

PSDB 8.3.2 (c) Excavate Unsuitable Material From Trench Bottom Unit : m3

Delete “within free haul distance” and replace with "within 10 km from an excavation".

PSDB 8.3.3 Excavation Ancillaries

PSDB 8.3.3.3 Compaction in Road Reserves Unit : m3

Replace the following sentence: “The volume will be measured as specified in 8.2.2, 8.2.3 and 8.3.3.1 “ with the following:

To determine the volume in the case of gravel roads, the depth will be measured from the underside of the gravel wearing course to the top of the fill blanket, and in the case of bitumen roads, from the underside of the subbase to the top of the fill blanket.

The rest of the trench shall be backfilled as specified in clauses 5.9.3, 5.9.4 and 5.9.5 as applicable, and payment will be made under item 8.3.6.1

PSDB 8.3.3.4 Overhaul

Replace the contents of this item with the following:

Measurement and payment shall be in accordance with sub clause PSD 5.2.5.

PSDB 8.3.4 Particular Items (sub clause 8.3.4)

(a) Shore trench Unit : m

Add the following to DB 8.3.4(a):

This must be allowed for in the contractor's rates as scheduled under item 8.3.2 & 8.3.3 SABS 1200 DB.

Delete DB 8.3.4(b) and replace with the following:

(b) Control of Ground Water Unit : m

The tendered rate for the effective control of ground water shall cover for all equipment, plant, material as well as the labour involved to use the well points, pumps and pipes, etc to control the ground water before and during excavation. The rate shall also cover the maintenance of the equipment for the total contract period. Payment for this item will only be made if the Contractor used well points and pumps to control ground water before or during excavation and measurement will be done on the length of pipe laid in trenches where ground water control had been applied.

PSDB 8.3.5 Existing Services that Intersect or Adjoin a Pipe Trench (sub clause 8.3.5)

PSDB 8.3.5(a) Services that intersect a trench Unit : m3

Add the following to DB 8.3.5(a):

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

i. The rate shall also allow for the following costs:

ii. Sufficient photo's have to be taken of existing services and handed over to the Engineer before they are being crossed, if there is a possibility of a difference in opinion over the condition of those services, especially on private property.

iii. If such a service is damaged, it has to be repaired to its original condition or if possible, to a standard agreed to in writing with the relevant owner. This agreement has to be approved by the Engineer.

iv. If such a service is removed, it has to be replaced as per original.

The unit of measure shall be per cubic meter per depth category

PSDB 8.3.5(b) Services that adjoin a trench Unit : No or m

Add the following to DB 8.3.5 (b):

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

The cost for shoring shall be deemed as covered by the listed items and no additional payment will be made for this.

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

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

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

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

If the structure, according to the abovementioned, does not qualify as an adjoining service but the foundation of the structure is such that if a 45° line drawn from the nearest bottom corner thereof cuts through the excavation, the structure will be measured as an adjoining service if approved by the Engineer.

If there is more than one service adjoining the same trench and such a service is on the same side of the trench, payment will only be made for the nearest service to the trench, or if they are the same distance from the trench for the top one. The maximum number of services that will be paid for, is therefore one on each side.

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

PSDB 8.3.6 Finishing

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

Replace DB 8.3.6.1 with the following:

a) Selected backfill material (150mm) :

93% mod AASHTO G7 quality material

b) Sub base (150mm) stab. 3% cement :

95% mod AASHTO G6 quality material

c) Base (150mm) :

98% mod AASHTO G3 quality material

d) Prime :

MC30 applied at 0.9 l/m2

e) Asphalt :

30mm nominal thickness continuously graded asphalt (26.5mm max)

The area will be calculated from the length of finished road or paved surfaces as applicable and with the trench width taken in accordance with base widths as indicated in clause 5.2 of SABS 1200DB. Payment for finishing will be additional to that for excavation covered by 8.3.2.

The rate shall cover the cost of supplying, processing, compaction and shall include the cost of delays and the cost of any risk of having to repair damage as specified in DB 5.10. Compaction to be according to PSDB 5.7.2.

f) Slurry Surface Treatment Unit : m2

The rate shall include for slurry surface treatment shall be measured brushed by squeegee and applied at a rate of 200m2/m3

g) Removal and replace existing kerbing: Unit : m

The rate shall include for the hand excavation of the existing kerbing and the reinstatement of the kerbing afterwards including haunching with 25/19MPa concrete.

PSDB 8.3.7 Accommodation of Traffic Unit : Sum

This item shall include for the accommodation of traffic and all road signage, flagmen as prescribed in the road signage manual of SA.

This item shall further also include for providing vehicle access to adjacent properties. Allowance shall be made for the provision of ramps over the trenches if necessary, to allow for access.

A penalty of R500-00 (five hundred rand) per day per stand will be deducted from the payment certificate for every day that vehicle access is not possible to a particular stand

Add the following sub clause:

PSDB 8.3.8 Saw Cut to Existing Road Surface Unit : m

The tendered rate shall include full compensation for all arrangements with the relevant authorities, cutting a 75mm mechanical saw joint and the removing of excess material.

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS

SABS 1200 DK: GABIONS AND PITCHING

PSDK3 MATERIALS

PSDK 3.2.1 Size (sub-clause 3.2.1)

Type of pitching shall be grouted pitching.

The dimensions of any individual stone pitching will comply with the values given for type of pitching 'medium' in Table 2

PSDK 5 CONSTRUCTION

PSDK 5.3.3 Grouted Pitching (sub-clause 5.3.3)

Where ordered by the Engineer all areas prone to water scour shall be pitched with stone. Stone for pitching shall be of good, sound, durable rock with minimum size as specified. Before pitching is commenced, all slopes and surfaces to receive pitching shall be carefully trimmed to the correct grades. The pitching stones are to be laid with joints broken as much as possible and are to be hammered solid in position to present a regular and uniform surface. All joints are to be grouted to their full depth in 4:1 cement mortar.

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS

SABS 1200 DM: EARTHWORKS (ROADS, SUBGRADES)

PSDM 3 MATERIALS

PSDM 3.2 Classification for Placing Purposes

PSDM 3.2.1 General (sub-clause 3.2.1)

The Contractor shall immediately inform the Engineer if and when the nature of the material being excavated changes to the extent that a new classification is warranted. Failure on the part of the Contractor to advise the Engineer thereof in good time shall entitle the Engineer to classify, at his discretion, such excavation as may have been executed in material of a different nature.

PSDM 3.2.2 Fill (sub-clause 3.2.2)

(a) Approved material for fill under roads shall comply with the following:

- Material Type G10 according to TRH 14
- Maximum plasticity index 3xGM + 10
- Minimum soaked CBR of 3

(b) no single rock particle shall have a maximum dimension of more than 150 mm except where rock fill is specified and then the relevant specification shall be applicable.

The minimum requirement for road bedding shall be the same as the minimum requirement for fill material.

PSDM 3.2.3 Selected Layers (sub-clause 3.2.3)

Approved material for selected layers shall comply with Material Type G7 according to TRH 14.

Approved material for selected layers shall comply with the following:

Material Type G7 according to TRH14

Minimum grading modulus	0.75
Maximum plasticity index	12
Minimum CBR at specified density	15

(93% Mod ASSHTO density)

PSDM 5 CONSTRUCTION

PSDM 5.1 Precautions

PSDM 5.1.1 Safety, Existing Services. Stormwater, etc. (sub-clause 5.1.1)

During construction, the road prism shall be kept well drained and protected at all times. All windrows shall be cut away after construction to prevent the concentrated flow of water on completed fill layers, but where necessary, flat berms shall be constructed to prevent undue erosion of fill slopes. All permanent drains shall be constructed as soon as possible plus sufficient additional temporary drains as may be necessary to protect the road pr Ruts and potholes developing in the fills after completion shall be repaired, and dam portions of the fills shall be reshaped and recompacted at the Contractor's own expense

All cut and fill slopes shall be maintained by the Contractor until the road has been cert as being finally complete.

PSDM 5.1.2 Accommodation of Traffic (sub-clause 5.1.2)

Refer to PSDB 5.1.3.

PSDM 5.2 Methods and Procedures

PSDM 5.2.2.2 Dimensions of Cut (sub-clause 5.2.2.2)

Dimensions of cuts shall generally be in accordance with the details of the typical cross section and this shall include the stormwater side drain.

All trimming of cut slopes shall be completed before any work on the subbase is commenced inside such cuttings.

PSDM 5.2.2.3 Use of Materials (sub-clause 5.2.2.3)

The maximum compacted layer thickness, excluding rock fill, required is 200 mm, but thicknesses from as little as 75 mm will be permitted. Wherever practicable, fill shall be placed in successive layers parallel to the final surface, and the construction of wedge-shaped layers shall be restricted to the bottom layers of fill.

The top fill layer shall be considered as a road bed and compacted as prescribed for road bed preparation. All other fill layers shall be compacted to 90% mod. AASHTO density

The Contractor is responsible for all arrangements and costs for the attainment of a suitable spoil site and fulfillment of all associated prescriptions.

PSDM 5.2.3 Treatment of the road-bed

PSDM 5.2.3.2 Removal of Unsuitable Material (sub-clause 5.2.3.2)

Replace the second sentence of paragraph (a) with the following:

The excavated spaces shall then be backfilled with approved imported material compacted to the required density.

Add the following sentence to paragraph (b):

Unsuitable excavated material will be paid for as cut to spoil.

In addition unsuitable material shall be material not complying with the relative prescriptions of sub-clause 3.2 and contain excess organic material or material in excess of 2% optimum moisture content at specified mod. AASHTO density.

Material too wet shall first be dried out to the required moisture content and be corn only when so approved by the Engineer.

PSDM 5.2.3.3 Treatment of Road-bed (sub-clause 5.2.3.3)

a) Preparation and compaction of Road-bed

Add the following paragraph:

Three-pass roller compaction

Any portion of the roadbed that is shown on the Drawings or is specified or is directed by the Engineer to be given three –pass roller compaction because of its indequated natural density, shall be prepared by shaping where the necessary and compacting with a roller , complying with the requirements specified below.

Compaction shall comprise three complete coverages by the wheels of the specified roller over every portion of the area that is being compacted. While it is not the intention that the Contractor should apply water to the roadbed for this type of compaction, and while no rigid moisture control will be exercised during compaction, the Contractor shall nevertheless satisfy the Engineer that everything is being done to take full advantage of favourable soil moisture conditions during the rainy season, and that such compaction is as far as far as possible carried out when the roadbed is neither excessively dry nor excessively wet.

The Engineer has the authority to decide when conditions are favourable for compaction and where such compaction is to be carried out at any particular time, and he has the right to instruct the Contractor to water the roadbed at the Contractor's expense when , in the opinion of the Engineer , the Contractor failed neglected or refused to comply with these requirements.

The rollers to be used for roller-pass compaction shall conform to the following requirements:

Grid roller: The grid roller shall have a mass of not less than 13,5 t when ballasted, shall be loaded to this mass if required, and shall be moved at a speed of not less than 12 km/h.

Vibratory roller: The Vibratory roller shall be capable of exerting a combined static and dynamic force of not less than 120 KN/m width for every metre of loss-layer thickness at an operating frequency not exceeding 25Hz and shall move at a speed not exceeding 4km/h.

(b) In-place treatment of road-bed in intermediate or hard rock material

Add the following paragraph:

Overbreak to a level 100 mm below the specified level shall be permitted and replaced with approved fill material. Overbreak in excess of the above shall be replaced by approved fill material at the Contractor's expense.

Material used to backfill excess overbreak shall be compacted to at least 90% mod. AASHTO density or as specified for the layer.

If a portion of the proposed road bed consists of material which is in the opinion of the Engineer is suitable for use in a selected layer, the material, equal to the depth of the selected layer, shall be temporarily bladed off to a windrow and the exposed surface treated as road bed.

PSDM 5.2.4 Fill

PSDM 5.2.4.1 Preparation (sub clause 5.2.4.1)

(b) Benching

Add the following:

Where the natural crossfall of the roadbed exceeds 1 (vertical) in 10 (horizontal), the fills shall be bonded to the road bed by means of benches excavated in the road bed.

Measurement of and payment for constructing benches shall be treated as "cut to fill" or "cut to spoil' as the case may be.

(f) Compaction

Add the following:

(i) Road bed preparation

For materials other than sand and rock fill: 90% of mod AASHTO density

(ii) Selected layer

For materials other than sand and rock fill: 93% Mod AASHTO density

PSDM 5.2.4.2 Placing and Compaction (sub clause 5.2.4.2)

(a) Spreading

Add the following:

The maximum layer thickness after compaction shall be 200 mm except for rock fill.

PSDM 5.2.4.3 Finishing (sub clause 5.2.4.3)

(b) Cut slopes

Add the following

Care shall be taken not to undercut any slopes which would cause sections to have steeper slopes than specified. All trimming of cut slopes shall be completed before any work on the subbase is commenced with.

The Engineer shall direct where grassing is required.

(c) Fill slopes

Add the following

No individual boulders occurring in other smaller sized material shall be allowed to project beyond the surface. All excess fill shall be removed immediately. No boulder in excess of 150 mm shall be used in fill slopes. The Engineer shall direct where grassing is required.

PSDM 5.2.8 Transport

Replace the contents of this subclause with the following:

The provisions of subclause PSD 5.2.5 of SABS 1200 D, as amended, shall apply.

PSDM 6 TOLERANCES

PSDM 6.2.1 General (sub clause 6.2.1)

Add the following:

Dimensions, Levels, etc. Degree of accuracy I will apply

PSDM 8 MEASUREMENT AND PAYMENT

PSDM 8.2 COMPUTATION OF QUANTITIES

Replace subclauses 8.2.1 to 8.2.3 (inclusive) with the following

PSDM 8.2.1 The provisions of subclause 8.2.1 of SABS 1200 D shall apply

PSDM 8.2.2 The provisions of subclause 8.2.2 of SABS 1200 D shall apply

PSDM 8.2.3 The provisions of subclause 8.2.2 of SABS 1200 D shall apply

PSDM 8.2.5 Verifying quantities

Replace the first sentence with the following:

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

PSDM 8.3 SCHEDULED ITEMS

PSDM 8.3.3 Treatment of roadbed

a) Roadbed preparation and compaction of material to

Add the following:

The unit of measurement shall be the cubic metre of material recompacted as specified and the volume shall be determined from levelled cross-sections on which are superimposed the levels

to which the roadbed is to be constructed. When material is imported to make up the required volume, such material will be paid for as cut or borrow to fill as relevant.

Add the following:

c) Three-pass roller compaction

Grid roller ……Unit : m3

Vibratory roller ……Unit : m3

The units of measurement shall be the square or roadbed compacted as specified in subclause PSDM 5.2.3.3 (c) for the areas designated by the Engineer.

The bid rates shall include full compensation for shaping the area, providing the rollers and compacting the roadbed by means of three roller passes over the entire area.

PSDM 8.3.5 Construction of selected layer compacted to 93% or 95% mod. AASHTO density will be material obtained from the designated borrow pit. Unit: m3

The rate shall include excavation, basic selection, transportation, spreading, watering, compaction, final grading, complying with tolerances and testing.

PSDM 8.3.12 Overhaul

Replace this item with the following:

Delete this item as no overhaul will be paid on material for the purposes of this contract and all the costs for transporting material shall be included in the applicable bid rates and amounts.

Add the following item:

PSDM 8.3.17 Final finishing and cleaning up of the site of works ……Unit : sum

The bid sum shall include full compensation for the clearing, disposal of material, finishing, tidying and all other work required to finish and clean up the site of the works and affected area by removing excess earth, stones, boulder, debris and other waste material, by clearing stormwater inlets and outlets and pipe barrels, by clearing the surfacing of all dirt, mud and foreign material, and by neatly finishing off all junctions, intersections and kerbing.

All material resulting from the finishing operations shall be disposed of to a spoil site finished by the Contractor.

The Bid rate shall make provision for the reinstatement of existing driveways to their original condition where these have been affected by the works, as these items will not be measured and paid for separately.

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS

SABS 1200 G: CONCRETE (STRUCTURAL)

PSG3 MATERIALS

PSG 3.2 Cement

PSG 3.2.2 Alternative Types of Cement (sub clause 3.2.2)

Replace the content of this subclause with the following:

Only CEM 1 42,5 (Portland cement) or CEM II/A-V 42,5 (Portland fly ash cement) according to (SANS 50197-1), may be used. The Cement may not consist of more than 20% siliceous fly ash blended with the OPC (Ordinary Portland Cement). Should the contractor wish to use any other type of cement, he shall obtain the Engineer's prior written approval (see 8.1.3.2 and 8.1.3.3)

PSG 3.2.3 Storage of Cement (Sub clause 3.2.3)

Add the following:

Cement shall not be stored for longer than 12 weeks without the Engineer's permission."

PSG 3.4 Aggregates

PSG 3.4.3 Storage of Aggregates (sub clause 3.4.3)

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:

PSG 3.9 Waterstops

PVC waterstops shall comply with the requirements of CKS 389.

PSG 3.10 Sealing Strips

The dimensions and manufacturer of the sealing strip for use in the reservoir are shown on the Drawings. The strip shall be permanently bonded to the prepared concrete surface in accordance with the manufacturer's instructions. The Completed joint shall be guaranteed 100% watertight and resistant to the long term affects of chemically treated water.

PSG 4 PLANT

PSG 4.1 General (Sub clause 4.1)

Add the following subclause:

The removable tie-rod ends shall facilitate removal without damage to the concrete and no permanently embedded parts of such tie-rods shall have less than 50 mm of cover to the finished concrete surface.

The cavities left in concrete when the tie-rod end cones are removed shall be soundly caulked with the cement mortar to which an approved shrinkage-reducing agent has been added, and shall ne neatly finished to a smooth surface uniform with that of the surrounding concrete.

The cost of supplying special tie-rods as well as the filling of cavities left by the tie-rod cones shall be included in the rates bid for formwork under the appropriate pay items.

On no account shall formwork be secured to reinforcing bars.

The Contractor is to submit a method statement of the Engineer for plugging /sealing holes left by formwork ties.

PSG 5 CONSTRUCTION

PSG 5.1 Reinforcement

PSG 5.1.2 Fixing (sub clause 5.1.2)

Add the following:

The Engineer will inspect the reinforcing after it has been fixed in place, the formwork has been cleaned, cover blocks have been positioned, and before concreting commences.

Welding of reinforcing steel will not be permitted.

PSG 5.1.3 Cover (Sub clause 5.1.3)

Add the following:

The distance between pipes in concrete and reinforcing steel shall nowhere be less than:

a) 40 mm or

b) The cover specified on the Drawings.

PSG 5.2 Formwork

PSG 5.2.1 Classification of Finishes (sub clause 5.2.1)

c) Special

Add the following:

This finish is obtained by first giving the surface a smooth finish with the joints between formwork panels forming an approved regular pattern suitable for the appearance of the structure. All projections shall then be removed, irregularities repaired, and the surface rubbed or otherwise treated until it is smooth with an even texture, appearance and colour.

If this finish of exposed surfaces of the entire structure or any part thereof as specified below, entirely at his own cost. All repairs must be completed before the rubbing commences.

The surface shall be saturated with water for at least one hour, The initial rubbing of the face shall be carried out with a medium coarse carborundum stone together with a small amount of mortar of the same cement/sand ratio as the concrete being repaired. Rubbing shall continue until all form marks, projections and irregularities have been removed and a uniform surface has been obtained. The paste produced by the rubbing shall be kept In place. The final rubbing shall be carried out with a fine carborundum stone and water. This rubbing shall continue until the entire surface has a smooth, even texture and is uniform in colour. The surface has a smooth, even texture and is uniform in colour. The surface shall subsequently be washed with a brush to remove surplus paste and powder.

PSG 5.2.2 Preparation for Formwork (sub clause 5.2.2)

Add the following:

Construction joints shall be positioned as shown on the Drawings

PSG 5.2.5 Removal of Formwork (sub clause 5.2.5)

Add the following subclause:

PSG 5.2.5.6 The Contractor shall make provision for continued support to beams and slabs

while the formwork is being removed and/or for back propping of beams and slabs.

PSG 5.3 Holes, Chases and Fixing Blocks (sub clause 5.3)

Add the following:

Cover blocks for reinforcing and fixtures may be placed into concrete provided that neither the strength nor any other desirable characteristics (such as the appearance) of the concrete section is affected or impaired in the opinion of the Engineer.

The holes or cavities left by ferrule heads in the concrete of water-retaining structures shall be filled with an approved non-shrink grout applied strictly in accordance with the manufacturer's specifications. The Contractor is to submit a method statement in this regard.

PSG 5.4 Pipes and Conduits (sub clause 5.4)

Add the following clause:

All pipes passing through concrete floors, walls or slabs shall be cast into a concrete member simultaneously with the casting of the member. Openings for pipes shall only be left in concrete members when so directed by the Engineer or when shown on the Drawings. Pipes shall be installed in such openings according to the details shown on the Drawings.

If the Water tightness is a requirement where pipes are cast into walls, floors and slabs, the Contractor shall ensure water tightness where smooth-surfaced pipes are used by using an

approved method such as tape wrapping the pipes prior to casting in. The cost of such method will be deemed to be included in the rates bid for item PSG 8.10

PSG 5.5 Concrete

PSG 5.5.1 Quantity

PSG 5.4.1.2 Consistency (sub clause 5.4.1.2)

Add the following to sub clause 5.5.1.2 (a)

The slump of concrete used in water retaining structures may not be less than 30mm and not more than 60mm.

PSG 5.5.1.5 Durability (sub clause 5.5.1.5)

The exposure conditions of the concrete are classified as severe.

PSG 5.5.1.7 Strength Concrete (sub clause 5.5.1.7)

Add the following:

The concrete mixes shall be designed by the Portland Cement Institute or similar approved laboratory.

The minimum cement content shall be 325 kg / m3. The maximum water: cement ration shall be 0,55 for ordinary Portland cement (OPC), CEM 1 42,5 according to SANS 50197-1, or 0,50 for ordinary Portland cement blended with pulverized fuel ash (PFA).

The cement content shall not exceed 400 kg/m3 OPC in reinforced concrete or 450 Kg/m3 OPC blended with PFA in reinforced concrete.

Add the following to sub clause 5.5.1

5.5.1.8 Durability

Concrete shall be so proportioned to ensure that the cement/water ration does not exceed 0.5 and to ensure workability, water-reducing admixtures of approved manufacture shall be used in preference to increasing the cement content.

PSG 5.5.3 Mixing (sub clause 5.5.3)

PSG 5.5.3.2 Ready –mixed concrete (sub clause 5.5.3.2)

Add the following:

Ready mixed concrete may be used on the site. The Contractor shall take samples for testing from every load delivered to the Site.

PSG 5.5.5 Placing (sub clause 5.5.5)

Add the following:

Concreting of the wall between horizontal construction joints shall be carried out in both directions from a point on the wall in order to close the gap with fresh concrete.

PSG 5.5.7 Construction Joints (sub clause 5.5.7)

Add the following:

Horizontal construction joints are permitted in structure wall in positions indicated on the Drawings or approved by the Engineer. Vertical construction joints in the walls are subject to the written approval of the Engineer and the cost of all such vertical or horizontal construction joint will be deemed to be included in the rates for cast- in situ concrete.

The construction joint in water-retaining structures shall be made strictly in accordance with the details shown on the Drawings.

Should the Contractor 's method of construction necessitate the placing of the construction or other joint in a position not shown on the Drawings, such method of construction and position of the joint shall be approved by the Engineer in writing. The Cost of such joint shall be included in the bid rates and shall be approved by the Engineer in writing. The cost of such joint shall be included in the bid rates and shall include scrabbling of the concrete where steel reinforcement is continuous.

The wall shall be cast in lifts of height that permits each lift to be poured without interruption in one continuous operation during normal working hours.

Every specified permissible deviation is binding in itself. The cumulative effect of permissible deviations will not be considered. The maximum permissible vertical deviation is subject to the other permissible deviations.

PSG 6 TOLERANCES

PSG 6.2.3 Specified PD's (Sub clause 6.2.3)

Replace sub clause 6.2.3 (d)(5) with the following:

Permissible Deviation		
Degree of accuracy		
III	II	I
mm	mm	mm
5	3	2
50	30	10

PSG 7 TESTS

PSG 7.1 Facilities and Frequency of Sampling

PSG 7.1.1 Facilities (sub clause 7.1.1)

Add the following:

The Contractor shall provide sufficient storage capacity for the concrete cubes and shall arrange to have them tested by an approved laboratory.

The cost of all testing, including the cost of sampling, storage and transport of samples shall be included in the rates bid for concrete work.

PSG 7.3 Acceptance Criteria for Strength Concrete

Add the following:

Test result obtained from the supplier of ready –mixed concrete will not be accepted for evaluation in terms of subclause 7.3, but samples for testing shall be taken of such concrete at the point of placing.

PSG 8 MEASUREMENT AND PAYMENT

PSG 8.1 Measurement and Rates

PSG 8.1.1 Formwork (sub clause 8.1.1)

Delete "or splays over 20 mm x 20 mm" from the first line of paragraph 8.1.1.2.

Add the following paragraphs:

8.1.1.7 For construction joint at kickers, all additional costs for formwork to edges up to 30 mm high will be deemed to be included in the rates bid for vertical formwork to sides of walls and will not be measured separately in narrow widths.

8.1.1.8 No Formwork will be measured to edges of blinding layers under structures, and the cost therefore (if needed) will be deemed to be included in the rate bid for concrete in blinding layers.

8.1.1.9 Back shuttering or formwork to top revealed surfaces of sloping or conical formwork will only be measured to surfaces of over 40 degrees and up to 85 degrees to the horizontal.

8.1.1.10 Formwork to horizontal surface in pump stations, valve chambers, manholes or sumps can either be removed through the manhole cover opening or the Contractor may use permanent formwork at his own cost as no claims in this regards will be considered.

PSG 8.1.2 Reinforcement (sub clause 8.1.2)

Replace the content of this subclause with the following:

The unit measurement for steel bars shall be the tons of reinforcement in place, in accordance with the Drawings or as authorised by the Engineer.

The unit of measurement for welded steel fabric shall be the kilogram of fabric reinforcement in place, and the quantity shall be calculated from the net area covered by the mesh, excluding overlaps.

Clips, ties, separators, stools and other steel used for positioning reinforcement will not be measured, unless these are shown on the bending schedules.

The bid rate includes full compensation for supply, deliver, cutting, bending, welding, placing and fixing of the steel reinforcement, including all typing wire, stools, supports and waste.

PSG 8.1.3 Concrete (sub clause 8.1.3)

PSG 8.1.3.1 Delete, or the plan size of excavation where additional excavation is provided of facilitate erection of forms from the second line of paragraph 8.1.3.1 (c)

PSG 8.2.5 Narrow Widths

Add the following:

Widths in excess of 300 mm shall not be regarded as narrow widths.

PSG 8.4 Scheduled Concrete Items

PSG 8.4.3 Strength concrete (sub 8.4.3)

Add the following after the last sentence:

In the case of structural floor screeds, the unit of measurement shall be the square metre and the average thickness and proportions will be stated.

For floor screed replace “Unit : m3” with “Unit: m2 or m3”

PSG 8.5 Joints (sub clause 8.5)

Replace “unit: m” with “unit: m or m2

Add the following items:

PSG 8.9 Screeds

Floor screeds (1:3) with falls including a smooth steel-trowelled finish to top:

Description of application and thickness .....unit : m2

Etc for other applications and thicknesses

The unit of measurement shall be the square metre of screeds constructed

The Bid rate shall include full compensation for constructing the screeds as specified including supplying of all materials, preparing the concrete surface to receive the screeds and for all else that may be necessary to complete the work.

PSG 8.10 Casting in Pipes with or without Puddle Flanges

Up to 300 mm nominal bore:

Description and thickness of structural elements .....Unit : No.

Over 300 mm up to 600 mm nominal bore:

Description thickness of structural elements .....Unit : No.

Etc for other nominal bores in increments of 300 mm

The Unit of measurement shall be the number of each size of pipe installed.

The Bid rates shall include full compensation for installing the pipe where new pipes are used (with or without a puddle flange) in the exact position as shown on the Drawings , for splitting or cutting the formwork where required, for ensuring water tightness where required and for all additional costs required to install the pipes specified or shown on the Drawings.

New pipes shall be measured under the items of the relevant section of the specifications.

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS

SABS 1200 L: BEDDING (PIPES)

PSL 3 MATERIALS

PSL 3.1 General

Add the following paragraphs:

Each type of pipe delivered to the site shall be of a standard length corresponding to the standard lengths offered by the pipe manufacturer in the catalogue, with a maximum permissible variation in length PF-+ 2%

A Pipe that is shorter or longer than the defined standard will be rejected by the Engineer, expect when such non-standard lengths are required in terms of the Contract and have been specifically manufactured or cut as such by the pipe manufacture or supplier.

PSL 3.4 Steel Pipes, Fittings and Specials

PSL 3.4.2 Pipes of nominal bore up to 150 mm (sub clause 3.4.2)

Add the following:

The pipes shall be normalised or seamless steel pipes and shall be used with malleable cast-iron fitting complying with the requirements of SABS 509.

Where flanges are required they shall comply with SABS 1123 table 1600 unless otherwise shown on the Drawings.

PSL 3.7 Other Types of Pipes

PSL 3.7.2 Polyethylene Pipes (sub clause 3.7.2)

Replace the contents of this clause with the following:

Polyethylene pipes shall be SABS ISO 4427 PE 100 PN10 HDPE pipes with compression fittings and shall comply with SABS 533 Part II.

Add the following sub clause:

PSL 3.7.3 Ductile Iron Pipes

Ductile iron pipes shall be class K9 pipes complying with SANS 50542-2003 (Edition 2) EN 545:2002 (EDITION 2) and shall be manufactured with spigot and socket push –in joint and Tyton rubber gaskets.

PSL 3.9 Corrosion Protection

PSL 3.9.2 Steel pipes

PSL 3.9.2.1 Steel pipes of nominal bore up to 150 mm (sub clause 3.9.2.1)

Add the following:

Steel pipes shall be galvanized where shown on the Drawings.

PSL 3.9.2.2 Steel pipes of nominal bore over 150 mm (sub clause 3.9.2.2)

Add the following:

Steel pipes shall be hot-dip galvanized where shown on the Drawings and as specified in sub-clause 3.9.2.2

Galvanized steel pipework, fittings, specials, etc. Shall comply with SABS 934 and 763 and be entirely coated with zinc after fabrication by complete immersion in a zinc bath. The finished surface shall be clean, uniform and any excess being removed. The zinc deposit shall exceed the followings:

Coastal areas: 0.735 kg/m2

Inland areas: 0.400 kg/m2

PSL 3.9.6 Corrosive Soil (sub clause 3.9.6)

Add the following:

Where shown on the Drawings, steel pipes in contact with corrosive soil shall be wrapped with Densopol 80 HT or an equivalent approved product, strictly in accordance with the manufacturer's instructions.

Add the following subclause:

PSL 3.9.7 Ductile Iron Pipes

Ductile iron pipes shall be coasted internally with a 5 mm thick cement mortar lining complying with SANS 5054: 2003 (Edition 2) and or EN 545: 2003 (Edition 2) and externally with a metallic zinc spray coating plus a layer of bituminous varnish to a total minimum film thickness of 70 micro, all in accordance with SANS 5054:2003 (edition 2)

Any pipes with damage to the lining or coating shall not be repaired but shall be removed from the site and replaced with pipes having undamaged linings and coatings.

PSL 3.10 Valves (sub clause 3.10)

Replace the contents of this subclause with the following:

PSL 3.10.1 Gate Valves

Gate valve shall, unless otherwise specified, be of the standard waterworks pattern with resilient seal gates and shall comply with the requirements of SABS 664. The gate valves shall be double flanged for all pipework.

In addition to the SABS specification the following special requirements shall be met:

a) The valve class shall be at least equal to that of the pipework in which it is to be installed. All valves shall be rated for a working pressure of at least 1,6 MPa (Class 16).

b) The valves shall be double flanged

c) The valves shall be supplied with a non-rising type spindle. Spindles shall be threaded such that two turns of the hand wheel shall effect a movement of 25mm on the gate valve.

d) The valves shall be fitted with a cast iron cap attached to the spindle by means of a “Stout brass screw” with a hexagonal head.

e) The valves shall be Clockwise Closing.

f) The lugs on the gate and the spindle are to conform to 3.2.3 of SABS 664 and are to be machined to a good fit and finish.

g) The design of the valve guides shall be such that all valves supplied can be mounted in any position

h) Valve trim shall be either Type B (gun metal trim) or Type C (stainless steel trim) as specified in SANS 664 Clause 3.5.5.

i) Seat rings shall comply with clause 3.5.6 of SABS 664 and shall be pinned into position.

j) The stuffing box may either be of the conventional type with gland packing with a gland secured with 2 No. bolts and nuts. The nuts shall be of the Tee pattern and the gland stuffing box shall be capable of holding four rings of a standard size of gland packing. The gland packing box shall be capable of being repacked under working pressure, preferably with the gate in the open position. The gland shall fit neatly and snugly into the stuffing box. The base of the gland stuffing box shall be chamfered to force the packing against the spindle.

k) Alternatively the sealing of the spindle body may be by means of “O” rings which are retained in position by means of machined grooves in the valve body and which seals against the spindle.

l) The valves shall be double flanged and drilled in accordance with SABS 1123/1977 for the required pressure rating.

m) Each valve shall be supplied with 2 No. full face rubber gaskets and the required number of nut, bolts and washers to suite the valves. The costs of these items shall be included in the rates tendered.

n) Valves which incorporate a thrust plate of the horseshoe type will not be considered.

o) Every sluice valve shall be provided with substantial guides cast on each side of the gate, preferably extending to the top of the nut box and operating along corresponding guides cast in the sides of the valve body (Brass trim only). Bronze guides shall be of phosphor bronze to BS 1400 PB 2-0.

p) The valves shall be drop tight at the specified working pressure applied to one side of the gate and the other side subject to open conditions.

q) The gate valves shall be supplied with the gland packing installed and shall be either "Maxmech Style M57, Chesterton 1724" or similar approved.

r) All valves shall be coated and lined by means of a powder (sintered) epoxy coating with a dry film of a least 250 micron.

PSL 3.10.2 Butterfly valves

Butterfly valve shall comply with the requirements of BSA 5155 and shall be of the double-flanged, lugged or water types, as specified. They shall be designed to fit between flanges drilled in accordance with SABS 1123.

Butterfly valve shall be controlled by weather-proof actuators fitted with hand wheels. Electrical actuators shall be provided if so specified on the drawings. Safety devices such as shear pins shall be built into the actuators to prevent damage to the valve should excessive force be applied to the hand wheel in the fully open or closed positions. If so specified, valves with a 10 mm diameter and smaller shall be controlled be controlled by direct-mounted ratchet handles.

Closure of valve shall be by clockwise movement of the hand wheel or ratchet handle and the fully open and fully closed positions shall be positively stopped.

Valve discs shall be of single casting, with a streamlined shape, and shall have smooth surfaces. Where resilient seats are specified, these shall be moulded to the shape of the valve body but shall be bonded to the body, so that they can be easily replaced.

Butterfly valves of class 16 and higher or with a 350 mm diameter and larger shall be fitted with self –lubricating, two-way, adjustable thrust bearings to permit precise disc to seat positioning at all times.

Valve shafts shall preferably be continuous, but if stub shafts are provided, they shall each extend into the disc hub for a distance of at least 1,5 times the shaft diameter.

Butterfly valves shall be installed with valve shafts in vertical position and hand wheels in a horizontal position.

PSL 3.10.3 Air Valves

Air valves shall have a single or double openings as specified and shall be manufactured, when applicable, to the same standards of quality and finish as laid down in SABS 664 for Gate Valves.

Air valve shall be "Vent-o-Mat-RBX" or similar (Flanged type)

PSL 3.10.4 Non-Return Valves for Pumping Mains

Non return valves shall be the Fig WDV 25 or similar approved and the following requirements shall be met:

a) Quiet operation

b) Water hammer to be minimized

c) Adapt to fluctuations in flow rate

d) Drop tight sealing

e) Reliable

PSL 5 CONSTRUCTION

PSL 5.1 Laying

Add the following:

Where connecting to the existing pipeline the position of the existing pipeline must be established by the excavation of test holes (Hand excavation) before any trench excavation to the planned connection point is undertaken. The Contractor will not be compensated for excavation and any other works that is executed and proves to be unnecessary because this specification was not followed.

PSL 5.4 Concrete Encasing (sub clause 5.4)

Replace the first sentence with the following:

Concrete encasing with concrete with a strength of 20/19 MPa must be provided at positions as indicated by the Engineer. Provision must be made to keep the pipe in position during the concrete encasing. The length of concrete encasing will be determined by means of an instruction from the Engineer.

Add the following:

Soilcrete Encasing

A mixture of Portland cement and gravel of sub base quality (G6) that is mixed in a ratio as prescribed must be provided at positions and lengths as instructed by the Engineer.

PSL 5.6 Valve and Hydrant Chambers

PSL 5.6.1 General (sub clause 5.6.1)

Replace the words “Drawing L-1 “ in the second line with “The Drawings”

PSL 5.6.2 Construction of Chambers (sub clause 5.6.2)

Replace the words “drawing L-1, L-2 and L-3” in the fourth line with “The Drawings”

Add the following subclauses:

PSL 5.11 Pipeline Route Markers

Route markers for the pipeline shall be erected at all changes in direction and 500 m intervals on straight sections and shall be manufactured according to details shown on the Drawings.

PSL 7 TESTING

PSL 7.3 Standard Hydraulic Pipe Test

PSL 7.3.1 Test Pressure and Time of Test

PSL 7.3.1.2 Replace 1,25 in the first line with 1,5. The maximum working pressure for different pipes in indicated by the class of the pipe.

PSL 8 MEASUREMENT AND PAYMENT

PSL 8.2 Scheduled Items

PSL 8.2.1 Supply, lay and bed pipes complete with couplings (sub clause 8.2.1)

The bid rates shall also include full compensation for the cost of all labour, material, plant, chemicals and overheads for complete sterilization of the entire pipeline and disposal of the sterilizing solution as approved by the Engineer.

Add the following:

"Payment" will be made as follow:

a) EIGHTY PER CENT (80%) of the sum tendered will be paid when the excavations has been completed to line and level and approved by the Engineer.

b) The remaining TWENTY PER CENT (20%) will be paid when the pipeline has passed the pressure testing, sterlized and the remaining backfilled has been completed to the approval of the Engineer.

PSL 8.2.11 Anchor blocks / Trust blocks and Pedestals (sub clause 8.2.11)

Insert "concrete" before "and" in the last line of the last paragraph

Add the following:

The tendered rates shall also include the wrapping of uPVC pipes and fittings with Densopol 80 or a similar approved material where the pipes and fittings come into contact with concrete.

"Add the following items"

PSL 8.2.16 Connection to existing main supply pipe..... Unit : No

The bid rate shall include full compensation for the cost of excavation, connection to existing main supply pipe, removal of surplus and waste material, all labour and equipment necessary to make the connection, removing the blank flange and all liaison with the local authorities.

PSL 8.2.17 Closing of water supply by relevant authority..... Unit : Sum

The bid sum shall include full compensation for all costs involved to arrange with the relevant authority to close the water supply.

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS

SABS 1200 LB: BEDDING (PIPES)

PSLB 1 SCOPE

Add the following:

This specification also covers the bedding required for sleeve pipes.

PSLB 3 MATERIALS

PSLB 3.1 Selected Granular Material (sub clause 3.1)

Substitute the clause with the following:

Selected granular material shall be an aggregate, sand or granular material, all of a non-cohesive nature and free from any organic material, of which the grading analysis shows 100 % passing a 13,2 mm sieve and not more than 5 % passing a 0,075 mm sieve.
Selected granular material shall have a PI not exceeding 6 and shall be free from sharp-edged particles exceeding 19 mm
Only if approved by the Engineer may sand from the trench excavations be used as selected material.

PSLB 3.2 Selected Fill Material (sub clause 3.2)

Substitute with the following:
Selected fill material shall be material that has a PI of less than 12 and does not contain vegetation or stones exceeding 20mm. Selected fill material may occur in-situ, be imported or selected from trench excavation.

PSLB 3.3 Bedding (sub clause 3.3)

Add the following:
All pipes shall be classified as flexible pipes and shall have a bedding of selected granular material and selected fill material.
uPVC and HDPE pipes are deemed to be flexible pipes for the purposes of this subclause.
Pipes shall be laid on Class B bedding (Rigid Pipes).

PSLB 3.4 Selection

PSLB 3.4.1 Suitable Material from Trench Excavation Available (sub clause 3.4.1)

Replace the first sentence with the following:
Notwithstanding the requirements DB 3.7 and LB 3.4.1 relating selected excavation methods, the Contractor must follow selected excavation methods and provide or use plant that will prevent material that is suitable and necessary for bedding being contaminated.

Provision in the rates shall be made for sifted sand for all the bedding, irrespective whether imported or in situ. Bedding shall include both the blanket and cradle layers. Under no circumstances will the contractor deviate from this specification unless written permission has

been granted by the engineer. Items 8.3.2.1 of the SABS 1200 LB schedule must be allowed for under either item 8.3.2 (a) SABS 1200 LB or item 8.2.1 SABS 1200 LB scheduled in the bill of quantities.
Replace the words "(but is not requires)" in the fifth line with the words" (at his own cost)"

PSLB 5 B CONSTRUCTION

PSLB 5.1 General

PSLB 5.1.4 Compacting (sub clause 5.1.4)

Substitute "90 % of modified AASHTO" in with "93 % of modified AASHTO
If sand is used the compaction grade must be 100% modified AASHTO.

PSLB 5.2.2.3(d) Borrow (sub clause 5.2.2.3(d))

If insufficient cut material is available to complete the earthworks in any particular section of the work, the Contractor shall locate other economic sources of borrow material, within the freehaul distance.

PSLB 5.2.5.1 Freehaul (sub clause 5.2.5.1)

All haul of material on site from borrow pit areas, as well as to dumping areas within 10 km will be regarded as freehaul. This freehaul distance is applicable to the whole of the contract.

PSLB 5.10 Borrow pits and, Commercial Off-site Sources (sub clause 5.10)

It is to be noted that no extra over payment will be effected for intermediate or hard rock excavations under these items. The contractor is to allow for this in his rates.

PSLB 8 MEASUREMENT AND PAYMENT

PSLB 8.1 Principles

PSLB 8.1.1 Supply of Bedding Materials Measured Separately (sub clause 8.1.1)

Add the following:
Payment for bedding material and selected fill material is only made if the selected trench excavation material cannot be used in the same position as bedding material but has to be obtained from another part of the site of works or designated borrow pits, or from commercial sources.

PSLB 8.1.5 Disposal of Displaced Material (sub clause 8.1.5)

Add the following:
Surplus displaced material shall be dumped and levelled at the spoil site.

PSLB 8.2 Scheduled Items

PSLB 8.2.2 Supply only of Bedding by Importation

PSLB 8.2.2.4 From stockpile (provisional)

a) Selected granular material Unit : m³
b) Selected fill material Unit : m³

The rate shall cover the cost of obtaining, handling and transport regardless the distance, of the required bedding material from the stockpile, the delivery thereof at positions that are spaced along the trench in such a way as suits the working method of the Contractor, as well as the removal of material displaced by this importation within a free haul distance of 0,5 km.

PSLB 8.2.5 Overhaul Of Material For Bedding Cradle And Selected

Fill Blanket Unit : m³.km

Substitute LB 8.2.5 with the following:

a) Limited overhaul (0,5 km to 1,0 km) Unit : m³
b) Long overhaul Unit : m³.km

Except that the volume is calculated according to LB 8.1.3, the requirements of D 8.3.6 or DA 8.3.3, as applicable, shall apply for overhaul.

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS

SABS 1200 LF: ERF CONNECTIONS (Water)

PSLF 8 MEASUREMENT AND PAYMENT

Add the following:

PSLF 8.2.9 Extra-Over item 8.2.1 for additional excavation in all materials for trenches, compact and dispose of surplus material.

This item shall cover all costs for the additional excavation required in addition to the length as indicated on drawing CIV 505.

The rate shall cover the costs of complying with the requirements of clause 5.1 of SANS 1200 DB, excavation, compact and dispose of surplus material as specified in SANS 1200DB as specified in 5.6.3 and 5.6.4. No haulage shall be applicable to this item.

The length will be measured for payment on the assumption that normal trench excavation has been carried out. The material will be classified as soft excavation in terms clause 3.1 of SANS 1200 DB. The rate shall include for selected fill material as defined in clause 3.2 of SANS 1200 LB and compaction to 90% mod AASHTO density with a minimum cover of 75mm below the pipe invert and compacted in layers not exceeding 200mm.

PSLF 8.3.10 Extra over item 8.2.1 for the supply, lay joint, test and disinfect the following pipes. Couplings included in item 8.3.1.

Pipelines will be measured by the additional lengths as laid. Separate items will be scheduled for each diameter and each type and class of pipe laid. The rates shall cover the cost of the provision of the pipe complete and the costs of handling, inspection, transportation, bedding, laying, jointing, cutting, testing and disinfecting of the pipes.

VARIATIONS AND ADDITIONS TO STANDARDISED SPECIFICATIONS

SABS 1200 ME: SUBBASE

PSME 3 MATERIALS

PSME 3.2.2 Gravel Shoulder and Gravel Wearing Course Material (sub clause 3.2.2)

Gravel wearing course material shall comply with the following:

a) the material shall be cationic

b) the grading modulus (GM) shall be between 1,2 to 2,5

c) the plasticity index (PI) shall be between 7 to 15

d) the natural CBR at 93% mod. AASHTO density shall be greater than 10

e) the maximum size of aggregate used shall be 40mm

f) the maximum swell at 100% mod. AASHTO density shall be 1,5

PARTICULAR SPECIFICATIONS

The following Particular Specifications for the works not covered by the SANS 1200 Standardized Specifications are also included hereunder and shall form part of the contract:

PA	:	Pipeline Valves
PB	:	Disinfection of Pipeline
PET	:	Steel Tanks
PC	:	Provision of Structured Training
PD	:	Provision of Temporary Workforce
PE	:	HIV/AIDS Specification
PF	:	Generic Labour – Intensive Specification
PG	:	Environmental Management Plan

PARTICULAR SPECIFICATION: PA PIPELINE VALVES

PA 1 SCOPE

This specification covers the material and constructional requirements for wedge gate, resilient seal, reflux, butterfly and air valves.

PA 2 DEFINITIONS

Single small orifice air valve - A valve capable of releasing small accumulations of air at all pressures throughout the working pressure range of the pipeline.

Single large orifice air valve - A valve capable of admitting or expelling large quantities of air during emptying and filling of the pipeline.

Double orifice air valve - A valve capable of satisfactorily carrying out the functions of both a single small orifice air valve and a single large orifice air valve.

PA 3 REQUIREMENTS

PA 3.1 General

The types, sizes, end connections, pressure ranges and other details of the valves required are detailed on the specification data sheets. Offer data sheets are included to permit tenderers to offer variations to the specification to suit their standard products.

PA 3.2 Materials, Workmanship and Construction

PA 3.2.1 Wedge Gate Valves

Wedge Gate valve must comply with SABS 664 or SABS 191 as applicable for waterworks pattern valves. They shall have non-rising spindles unless specified or scheduled to the contrary.

Valves must also be provided with the following

a) Handwheels, unless specified or scheduled to the contrary
b) Fully enclosed gearing, where necessary to limit the maximum torque to be applied at the handwheel spindle or cap top to 120 Nm under an unbalanced pressure equal to the maximum working pressure for the classes scheduled
c) The facility to permit repacking of the gland whilst the valve is under working pressure
d) Stainless steel jacking/limiting screws for valves with a nominal bore greater than 600 mm and with metal gates.
e) Seats must be glued and pinned into place for all valves up to and including Class 25 valves, except for Class 25 valves where the gate test pressure is to be 2x working pressure. In the latter case deposit welded and machined seats must be provided.

PA 3.2.2 Resilient Seal Valves (RSV's)

In addition to the requirements of 3.2.1 above, RSV's shall be provided with the following:

a) Grade 304 stainless or EN57 steel spindles as scheduled.

b) At least two nitrile rubber "O" sealing rings in a corrosion resistant housing, plus one nitrile rubber wiper ring to prevent the ingress of dirt.

PA 3.2.3 Reflux Valves

Single-door reflux valves must be cast iron, spheroidal graphite (SG) iron or cast steel, and comply with SABS 144 or SABS 192 as applicable. Unless otherwise scheduled, gunmetal trim shall be provided for cast iron valves and stainless-steel trim for cast steel valves.

Valves with a nominal bore greater than 600 mm must be of the double door or multi-door type and may be fitted with an integral bypass. In other respects, they must be in accordance with the specifications for the single door type.

A suitable arrow indicating the flow direction through the valve shall be cast onto the body of the valve.

PA 3.2.4 Butterfly Valves

The valves must comply with BS 5155 for tight shut off service for the types, classes and sizes listed in the 'Specification Data Sheets' or Schedule of Quantities/Prices.

The basic materials for butterfly valves should be as follows:

		Class PN 10	**Classes PN 16 + PN 25**	**Class PN 40**
Body, disc handwheel	DN 350 to 600	Cast iron or S G Iron	S G Iron	Cast steel
	DN over 600 mm	S G Iron	Cast steel	
Seating ring: a) Separate b) Integral		Gun metal or stainless steel Hard chrome coated	Stainless steel Nylon coated	
Bearings				
Seal clamp rings		Bronze or stainless steel	Stainless steel	Stainless steel

The bottom of the disc must move in the flow direction when opening from the closed position, except where specified to the contrary. The valve shall be droptight under the maximum pressure rating condition.

The face to face dimensions shall be as set out in Table 6 of BS 5155 in the column headed "double flanged short" for double flanged valves and in the column headed "wafer long" for wafer valves.

A suitable arrow indicating the preferred flow direction through the valve, where such preference is applicable, shall be cast onto the body of the valve.

Unless otherwise scheduled a side mounted manual actuator shall be provided. The actuator shall be a separate unit bolted to the main valve body on the side designated in the data sheets when facing the normal direction of flow. Water must not leak past the main shaft and enter the actuator. An indicator which shows the extent of opening the valve disc must be fitted.

The designated power source for the operation of a power operated actuator is given in the data sheets. This source may be of an electric, hydraulic or pneumatic nature, as specified. The actuator shall comply generally with AWWA C504, and shall be capable of withstanding opening and closing torques at least 30% in excess of those necessary under the maximum working condition using the designated power source.

All actuators, whether power operated or not, shall be supplied complete with horizontal handwheel at a height that provides for reasonable operation in each situation shown on the drawings. The handwheel shall comply with the relevant requirements of SABS 664. The handwheel must be mounted on a vertical shaft and must require not more than 120 Nm of input torque to operate against a maximum unbalanced head equal to the pressure rating of the valve.

All power operated actuators are to be fitted with 'Open' and 'Closed' limit switches and a 4 - 20 mA position transmitter.

PA 3.2.5 Air Valves

The materials and workmanship employed in the manufacture of air valves shall be at least equal to the standard required by SABS 664 for waterworks pattern valves.

Large orifice and double orifice air valves shall be provided with an automatic anti-shock device to prevent the creation of shock pressures at the orifice due to slamming, caused by the arrival of liquid after venting of air from a filling pipeline. The maximum pressure induced after sudden closure shall be less than twice the rated working pressure of the valve. The same valve shall also be capable of allowing air into the pipeline in large quantities during pipe draining operations.

Small orifice air valves shall be capable of discharging accumulated air under the normal working pressures in the pipeline.

No valve shall weep or leak at any operating pressure between twice the specified working pressure down to 50 kPa, or lower if so specified.

The valves shall be constructed from corrosion resistant materials and be easily dismantled for cleaning and maintenance purposes.

PA 3.3 Marking

In addition to the requirement of SABS 144 or SABS regarding marking, all valves must be provided with an identification plate on which the following information shall be indelibly cast or embossed;

a) The item or tag number;
b) The size or nominal bore of the valve;
c) The class or working pressure of the valve.

PA 3.4 End Connections

End connections shall be flanged or screwed as scheduled.

a) Flanges - Where flanged connections are specified the dimensions and drilling of the flanges must comply with SABS 1123 except where otherwise scheduled. The front faces or flanges must be flat and normal to the bore of the valve. The back of the flanges, bonnets etc must be flat and normal to the bore or be spot-faced over an area large enough to freely accommodate the washer and the nut.

Drilled holes for the passage of bolts must be provided where wafer type butterfly valves are scheduled.

Flange gaskets must be CPAF with a minimum thickness of 3mm. Bolts must comply with SABS 135 or SABS 136. Washers must conform to SABS 1149. All ferrous nuts, bolts and washers must be galvanized to SABS 763.

b) Screwed ends - Where screwed ends are specified the valve shall be threaded to BSP.

PA 3.5 Drawings

The supplier shall provide two paper prints of fully dimensioned drawings for each type of valve and actuator when requested by the Engineer.

PA 3.6 Mounting Feet

Valves with a nominal bore of 450 mm or greater must be provided with mounting feet where called for on the specification data sheets.

PA 3.7 Lifting Eyes

A lifting eye at the top of the valve body shall be provided, where the combined mass of the valve bypasses and actuator exceeds 75 kg.

PA 3.8 Protection Prior to Installation

Valves shall be temporarily covered and protected against UV radiation at all times prior to installation.

PA 4 TESTING

PA 4.1 Test Certificates

A test certificate shall be provided with each valve wherein it is certified that the valve has been inspected and tested and that it complies with the specification. An independent inspector may be appointed by the Employer to witness the testing; in such case the inspector must also sign the test certificate. The charges made by the independent inspector will be paid by the Contractor.

At least three working days written notice must be given of the proposed date and time of the test. In the event that the valve(s) to be tested not being ready the Employer reserves the right to deduct any fruitless inspection costs from moneys due to the Contractor.

PA 4.2 Test Requirements

Hydraulic tests shall be carried out at the factory on each valve as follows:

PA 4.2.1 Gate Valves

In accordance with SABS 664 or SABS 191 (as applicable).

In addition to the test requirements in the applicable SABS specification all valves with a nominal bore greater than 450 mm shall be subjected to an open end gate strength test of 1,5 times the working pressure. Drop tightness in respect of this gate strength test is not required.

PA 4.2.2 Reflux Valves

In accordance with the requirements of SABS 144 or SABS 192 (as applicable) to the following pressures:

a) Body with clack open - 2,0 times class max working pressure

b) Door strength - 2,0 times class max working pressure

c) Seating with doors closed - 1,1 times class max working pressure, under which pressure the seat must be drop tight

The door strength must be capable of withstanding the test pressure applied to the body without damage or distortion.

PA 4.2.3 Butterfly Valves

Each valve is to be tested at the factory in accordance with the requirements of BS 5155.

PA 4.2.4 Air Valves

Each Valve is to be tested at the factory as follows:

a) Body Test - The valve shall be filled with water and a pressure equivalent to twice the maximum working pressure shall be applied for 5 minutes. There shall be no loss of water from the valve during the test.

b) Low Head Leak Test - Lower the pressure to 50 kPa and maintain the pressure for 5 minutes. There shall be no loss of water from the valve during the test. Steadily lower the pressure further to ascertain at what pressure seepage begins and record that pressure.

c) Drop Test - One valve taken at random from each batch of ten small orifice and double orifice air valves (or less) shall be subjected to a "drop test". The valve shall be filled with water and pressurized to above the working pressure and isolated from the test rig by closure of an isolating valve. A chamber in the test rig immediately prior to the isolating valve must be filled with compressed air at a pressure equal to that being maintained in the air release valve. The isolating valve is then opened so as to allow the air to rise in the air release valve without the pressure dropping lower than 2 - 3 bar (29 - 44 psi) above rated working pressure of the air release valve. The "DROP TEST" is then carried out by slowly bleeding off the pressure through a suitable cock until rated working pressure is reached and the float drops away from the orifice to allow discharge. Failure of the air release valve to function in the manner described will be reason for rejection.

PA 5 CORROSION PROTECTION

The cleaning and corrosion protection of valves must be carried out at the factory prior to dispatch to the Site. Non-ferrous metal or stainless-steel surfaces must not be painted. The protection to be applied must comply with one internal and one external systems from the following alternatives:

System 1 (Epoxy resin paint) - All cast iron surfaces of every valve, other than RSV's, must be prepared for painting to a thoroughly clean condition free of all grease and deleterious matter. Ferrous surfaces must be prepared in accordance with the Swedish Standard SIS 05 5900 to an Sa 3 finish. Surfaces must then be coated with a non-toxic epoxy resin paint to give a total minimum dry film thickness of 250 micron to be pinhole free over the entire painted surface.

System 2 (Epoxy powder coating) - Electrostatically applied epoxy powder coating (ESPC), of the fully disassembled valves shall be carried out in accordance with SABS 1217 as may be modified by this Specification. All RSV's are to be treated with this system.

All surfaces of the fully dis-assembled valve shall be blast cleaned to Sa 3 of Swedish Standard SIS 05 5900, having an angular profile of 40 micron to 60 micron.

The coating medium shall be an exterior grade, tinted, non-toxic and non-tainting, suitable for use with potable water and applied strictly in accordance with the manufacturer's instructions in a single application to a minimum film thickness of 300 micron. The coated surface shall be subjected to a standard MEK 50 double rub test. Particular attention shall be given to the thickness and integrity of the coating in the areas where the gate of the RSV is to operate. Low voltage, wet sponge EID detection of pinholes is to be conducted on all surfaces of the valve. A visual inspection, to be carried out by an experienced observer, shall reveal the finished coating to be smooth and glossy, free from excessive runs, sags, "orange peel" finish, occlusions and other visible defects. The coating shall be subjected to a "hot water soak" adhesive test at the

inspector's discretion, and no more than 15 mm disbondment from the point of the "V" (cut at a 30° angle) shall be permitted after immersing in water at 78° C for 48 hours, and testing adhesion after cooling to 25° C. Repairs shall be carried out using an approved repair system. ("Hi-Cote" or similar approved.)

System 3 (external only) - Apply multi coats of an approved epoxy coal tar paint to give a minimum total dry film thickness of 240 micron. The paint shall be applied in accordance with the paint supplier's recommendation.

System 4 (external only) - Apply one coat of zinc chromate primer followed by one coat of undercoat tinted where necessary, and a final coat of best quality gloss enamel. The total dry film thickness of the system must be not less than 200 micron.

After erection on site all valves must be cleaned and the paintwork refurbished where necessary to restore the condition to that pertaining at the time of leaving the factory.

PARTICULAR SPECIFICATION: PB – DISINFECTION OF PIPELINE

PB 1 INTRODUCTION

The price for testing and disinfecting pipelines and fittings is included in the scheduled items for supply and installation.

On completion of construction, after pressure testing and prior to commissioning the pipeline is to be disinfected by the contractor in accordance with this specification.

PB 1.1 Scope of the Code of Practice

This Code of Practice relates to the disinfection of parts used for the disinfection of complete installations.

It includes the requirements for bacteriological sampling and dosage of disinfectants, dose rates of disinfectants, disposal of chlorinated water and quality standards for bacteriological samples.

PB 1.2 Definitions

Within this document the term HYPOCHLORITE SOLUTION means a commercial solution of sodium hypochlorite containing 10% to 15% of available chlorine. Also, 10% HYPOCHLORITE SOLUTION means hypochlorite solution diluted one part in ten which thus has approximately 1% of available chlorine.

Within this document AVAILABLE CHLORINE and all chlorine concentrations means FREE CHLORINE available to the water environment for its disinfection.

'Water Supply Personnel' means any employee or contract or casual labour whose work includes, even temporarily, the performance of work concerned with partially or fully treated water and sources of underground water and who must possess a current certificate of medical suitability signed on behalf of the Authority.

PB 1.3 Hygiene

Only 'Water Supply Personnel' may undertake the procedures laid out in this Code of Practice.

PB 1.4 Safety

This Code of Practice does not cover the safety aspects of the construction or maintenance of installations or apparatus or of disinfection procedures.

Remember always that chlorinating agents are strongly corrosive so protect EYES AND HANDS especially.

PB 2 GENERAL REQUIREMENTS FOR DISINFECTION OF POTABLE WATER APPARATUS

PB 2.1 Components and Equipment

Clean all pipework components, equipment and tools used for repair and remove all grease or scale from components and equipment before use or assembly.

Where full chlorination and bacteriological testing is impractical, then disinfect all materials, components and equipment which could transmit contamination. Use a solution containing 1% of available chlorine (e.g. 10% chloros or other commercial hypochlorite solution or 2% solution of bleaching powder. Contact time must exceed 20 minutes. Rinse or flush the equipment with mains water to prevent excessive corrosion.

PB 2.2 Completed Installations

Ensure that all water used for disinfection purposes has a free chlorine residual of at least 20 mg/ℓ. Refer to section PB 4 and Tables 1 and 2 for volumes or dose rates.

During chlorination the pipeline shall be kept full of water.

Whenever possible keep the installation at normal operating pressure or greater during the contact period.

PB 2.3 Portable Test Equipment

Portable test equipment which may be used in contact with potable water must be kept clean. Any equipment which is in uncertain condition or which is contaminated must be cleaned and disinfected before use.

PB 3 MAINS

PB 3.1 New Mains

PB 3.1.1 Introduction

Do not connect any new main into supply until the water from designated sampling points, having stood in the main for at least 20 hours, has met the criteria specified herein.

New mains are laid with the intention of ensuring as far as possible, the exclusion of debris and contamination, but presume at the disinfection stage that debris and contamination does exist, and that this debris is resistant to disinfection, e.g. compacted soil or detritus in joints.

The disinfection procedures, which should follow pressure testing, include:

(a) Swabbing and flushing of the main

(b) Soaking of the main for a minimum period of 20 hours, using a minimum concentration of 20 mg/□ of available chlorine in mains water.

(c) Removal of excess chlorine by flushing the main

PB 3.1.2 Pressure Testing

Only use potable quality mains water for pressure testing new mains. Pressure testing normally follows the construction of each section of the pipeline but precedes final connection to supply. Do not rely on a single sluice valve to isolate the new main from the supply network, while the main is under pressure until disinfection and approval are complete.

PB 3.1.3 Swabbing and flushing

Swab all new mains after pressure testing and prior to disinfection.

After insertion of a soft foam swab, which has been soaked in 10% hypochlorite solution, recharge the pipeline at a rate less than 50 mm per second (3 m per minute) to ensure that the swab is not moved.

Open the inlet valve fully and drive the swab along the pipeline, at a velocity less than 0,5 m per second (30 m per minute), by controlling the valve at the discharge end.

When the swab reaches the discharge end of the pipeline, flush the main for at least 5 minutes to remove all excess chlorine and discoloured or dirty water. Where possible open inlet and outlet valves as fully as possible.

If the swab removes excessive amounts of debris then re-swab the main.

PB 3.1.4 Chlorination

Chlorinate all new mains to a minimum of 20 mg/□ available chlorine and leave to soak for a minimum of 20 hours, prior to flushing with mains water to a chlorine residual equal to that of the background level in the incoming mains water.

Tables in PB 4 show the required minimum dose rates and volumes.

To chlorinate sections of distribution main, less than about 50 m long not exceeding 150 mm in diameter, use a soft swab which has been soaked in 10% hypochlorite solution and proceed as follows:-

- Pour 1 litre of hypochlorite solution for each 1 m³ of pipeline, into the end of the pipe upstream of the final connection.

- Insert the swab into the end of the upstream pipe to retain the hypochlorite solution.

- Make the final connection.

- Drive the swab past the final connection and along the pipeline, but do not allow the swab to travel at a speed greater then 0,3 metres per second (20 m per minute).

- Remove the swab and flush the main for 25 minutes.

- Close up the main prior to soaking and sampling in accordance with section PB 3.1.6.

The volume of hypochlorite needed for 50 m of pipeline is:-

50 mm - 100 m□, 75 mm - 200 m□, 100 mm - 500 m□,

150 mm - 900 m□, 200 mm -1600 m□, 250 mm - 2500 m□.

Take all necessary care with the disposal of chlorinated water; follow the procedure laid out in PB 5.

PB 3.1.5 Sampling for Bacteriological Analysis

Once all pressure testing, swabbing and chlorination is complete, fill the main with clean mains water free from excessive chlorine.

Flush all hydrants, washouts and other outlets until the water is clean and free from excessive chlorine. Shut the valves and leave the main to soak for a minimum period of 20 hours.

First check with the approved laboratory to determine a suitable time for collection of samples and delivery of them to the laboratory for analysis.

Then pressurise the main and take samples for bacteriological analysis in accordance with the procedure given in section PB 3.1.6. Take these samples from sampling points agreed with the Resident Engineer.

Deliver all samples to the laboratory as soon as possible. Analysis must start within six hours but store the samples in a refrigerator if the delay between taking the sample and the start of analysis is likely to exceed four hours.

Then isolate and leave the main until the results of analysis are available. In the event that the samples fail, flush the main and re-sample after a further soak period of at least 20 hours.

Repeat the above process until disinfection criteria have been satisfied.

The costs of all necessary testing are to be borne by the Contractor.

PB 3.1.6 Sampling Points

Sample points should consist of a ferrule connection, with a short length of polythene piping terminating in a ½" BSP gate valve or manual air valve. Protect this sampling outlet by suitable boxing. Attach a sampling standpipe to the gate valve, disinfect the apparatus with hypochlorite solution and then flame the bib tap outlet on the standpipe. Flush out all traces of hypochlorite, check that the residual chlorine level is not greater than the normal level in the incoming mains water.

At scour points and air valves, flush out all trace of hypochlorite, check that the residual chlorine level is not greater than the normal level in the incoming mains water, then take samples.

PB 3.1.7 Temporary Cross Connections and Final Connections

Where a temporary cross connection supplies mains water to the new main, before making the final connection complete the disinfection procedure of the new main as set out above.

When the new main has been proved bacteriologically satisfactory the cross connection may be removed and isolated after suitable disinfection.

PB 4 DOSAGE OF CHLORINATING AGENTS

PB 4.1 Sodium Hypochlorite Solution

Bulk supplies of sodium hypochlorite solution (Chloros for instance), are supplied at 10 to 15% available chlorine. This fraction declines progressively as the hypochlorite decays to chloride, chlorate and oxygen. Assume in practice that there is only 10% available chlorine.

Assuming 10% available chlorine, and using mains water having a zero chlorine demand, then the following values give estimates of the dilutions required.

- 10% hypochlorite solution (1 part hypochlorite solution in 10 parts solution) contains 10,000 mg available chlorine per litre of 10 kg available chlorine per cubic metre.

- 20 mg available chlorine per litre is equivalent to 200 ml of hypochlorite solution per cubic metre of water.

- 0,5 mg available chlorine per litre is equivalent to 5 ml of hypochlorite solution per cubic metre of water.

PB 4.2 Chlorine Gas

Chlorine gas, dosed into water by weight, is likely to be about 98% available chlorine. Therefore a direct measurement gives a reasonable estimate.

- Disinfection of replacement parts with chlorine gas in not a practicable possibility.

- 20 mg Chlorine gas (by weight) per litre for disinfection of complete installation is equivalent to 20 grams per cubic metre.

- 0,5 mg Chlorine gas (by weight) per litre of water is equivalent to 0,5 grams per cubic metre.

PB 4.3 Bleaching powder, granules and tablets

Bleaching powders, granules or tablets based on Calcium hypochlorite contains 50% to 70% of available chlorine by weight. These materials must be stored under dry conditions. During storage some available chlorine is lost. Follow the manufacturers instructions particularly concerning the shelf life of the material and dose rate of the tablets.

For calculation purposes presume a maximum value of 50% available chlorine i.e. 1 gm of powder, granules etc in 1 litre of water provides 500 mg per litre available chlorine.

PB 4.4 Dose rates

Tables 1 and 2 provide estimates of the minimum dose rates of sodium hypochlorite solution, chlorine gas or bleaching powder, tablets or granules to achieve available chlorine levels of 20 mg per litre when dilute with mains water which has a zero chlorine demand.

Table 1 - dosage for 1,000 m of pipeline to give 20 mg available chlorine per litre

Pipe Diameter	Volume of 1000 m of pipeline	Weight of **bleaching pow-der granules or tablets** to give 20 mg/ℓ	Weight of **chlorine** to give 20 mg/ℓ	Volume of **hypochlorite** solution to give 20 mg/ℓ

mm	m³	gm	gm	litres
50	1,9	80	40	0,4
75	4,4	180	90	0,8
100	7,9	320	160	1,5
150	17,7	700	350	3,5
200	31,4	1,260	630	6,2
250	49,1	2,000	980	9,7
300	70,7	2,800	1400	14,0
350	96,2	3,800	1900	19,0
400	125,6	5,000	2500	24,6
500	196,3	7,800	3900	38,4
600	282,6	11,200	5600	55,4

Table 2 - dose rates for 20 mg available chlorine per litre

Flow rate in pipeline*		**Hypochlorite** solution injection rate 20mg/ℓ		**Chlorine** injection rate for 20 mg/ℓ
litres/sec	m³/hr	litres/hr	mℓ/sec	gm/hour
1	3,6	0,7	0,2	72
2	7,2	1,4	0,4	144
3	10,8	2,2	0,6	216
4	14,4	2,9	0,8	288
5	18,0	3,6	1,0	360
6	21,6	4,3	1,2	430
7	25,2	5,0	1,4	500
8	28,8	5,8	1,6	576
9	32,4	6,5	1,8	650

* For flows greater than 9 litres/sec the dose rates can be calculated by multiplying by an appropriate factor of 10 e.g.

186 litres/sec = 100 +n 80+ 6 litres/sec

hypochlorite solution = 70+ 58 + 4.3 = 132,3 litres/hr

PB 5 DISPOSAL OF CHLORINATED WATER

PB 5.1 Introduction

When the pipeline has passed all disinfection criteria if must be drained without causing hazard.

PB 5.2 Methods of Disposal

PB 5.2.1 Overland

Explore the possibility of soaking away disinfection water on adjacent land in rural situation.

PB 5.2.2 Foul sewers

Where disinfection water is discharged into a combined or foul sewer, no de-chlorination is normally necessary but in the former case take care that the rate of discharge of disinfection or flushing water avoids operation of storm sewage overflows and/or the creation of a hazardous atmosphere within the sewer.

PB 5.2.3 Watercourses

In rural areas where disinfection water is discharged to watercourses, either directly or through surface water drains, do not permit a free chlorine concentration in the receiving stream in excess of 0,1 mg/l about 50 metres downstream of the point of discharge. If the discharge is into a ditch, which is not a spawning ground or a nursery or a fishing stream, take advantage of that ditch to mop up chlorine provided that in a significant stream the earlier mentioned limit is not exceeded. In these circumstances use flush water to dilute the chlorinated water whenever possible. Avoid discharge of disinfection water to the head of a watercourse because this area is probably a spawning ground.

PB 5.2.4 Disposal of large volumes

When disposing of large volumes of disinfection water from very long lengths of new main, or in any cases of doubt, consult through the Resident Engineer, the laboratory staff of the Employer.

PB 5.3 De-chlorination

There is no objection to the use of thiosulphate or sulphur dioxide as de-chlorination agents. In some cases, at least partial de-chlorination may be achieved by discharge over land. In all cases consult the Resident Engineer.

PB 6 QUALITY STANDARDS AND REPORTING PROCEDURES

PB 6.1 New Mains

PB 6.1.1 Bacteriological Standards

No coliform organisms shall be detected in 100 mℓs of the sample.

The increase in the yeast agar plate count when compared with that of the incoming water shall generally be less than 50 and never more than 150 colonies per ml when incubated at 37 □C for 24 hours.

PB 6.1.2 Procedure for Unsatisfactory Samples

Whenever even one E.Coli, or 5 or more coliforms per 100 ml are detected, re-chlorinate the main or serve reservoir. When E.Coli are not detected but the total coliform count is less than 5 per 100 ml flush and re-sample the main.

PB 6.1.3 Physical Standard

If the sample is unusually coloured, turbid or frothy flush the main until acceptable. If this condition is severe, re-sample the main but do not put into service until the samples have passed the required standards.

PB 6.2 Reporting Procedure

Records of disinfection are to be handed to the Resident Engineer.

PARTICULAR SPECIFICATION: PET ELEVATED TANKS

PET 1 Scope

This specification covers the supply of all materials and erection of pressed sectional steel elevated water tanks and associated work and accessories.

PET 2 Materials

PET 2.1 **Tank**

PET 2.1.1 Base and Side Panels

All base and side panels shall be 1 220 x 1 220 mm size mild steel plates, cold pressed in one piece with flanged edges and embossed with an appropriate emblem. The material thickness of the panels shall be 5 mm.

PET 2.1.2 Cover

The cover sections shall be 3 mm thick mild steel plates cold pressed in one piece with flanged edges. The cover sections shall not be shorter than the outside edges of the top side panel flanges.

PET 2.1.3 Access Manhole

An access manhole shall be provided in the cover directly above the inlet pipe. The manhole shall be manufactured from 3 mm thick steel plate with flanged edges to the following requirements :

Clear opening size	:	450 x 600 mm.
Hinges	:	4,5 mm thick steel plate with 12 mm bolts as hinges.
Security	:	Locking hasp from 4,5 mm plate, with 12 mm hole for padlock.
Opening	:	Handle from 4,5 mm thick steel plate.

PET 2.1.4 Roof Vents

Roof vents shall be provided in the cover as specified by supplier – to be approved by Engineer.

PET 2.1.5 Stays

Where necessary for structural stability, stays fabricated from mild steel angle sections bolted to cleats or to the panel flanges must be provided in accordance with the manufacturers specifications.

PET 2.1.6 Gaskets

Sealing strips shall be odourless, tasteless and non-toxic and shall be pre-punched to suit the hole centres in the plate flanges.

PET 2.1.7 Bolts, Nuts and Washers

a) External jointing

Bolts nuts and washers for external use shall be mild steel grade 4.6, hot-dipped galvanised or high tensile bolts.

b) Internal jointing

Bolts, nuts and washers for internal use shall be grade 304 stainless steel.

Washers shall be fitted behind the heads of all bolts as well as under nuts.

PET 2.1.8 Pipe Openings

Each tank shall be provided with four flanged penetrations for the inlet, outlet, overflow and scour pipes in accordance with the diameters, positioning and details provided on the drawings and confirmed with on site.

Flanges must be drilled to SABS 1123 Table 1000/3 and must be provided as follows :

a)	Inlet pipe	:	Double flanged connection – 200mm below roof
b)	Outlet pipe	:	Double flanged connection with strainer - 200mm above and 200mm below floor
c)	Overflow pipe	:	Single flanged connection – 100mm below roof
d)	Scour pipe	:	Single flanged connection – 200mm below floor

PET 2.1.9 Corrosion Protection

The tank panels, pipe connection pieces and roof vent shall be hot dip galvanized to SABS 763 after manufacture.

PET 2.2 Catladder

A steel catladder providing safe access from ground level to the top of the tank (cover) must be provided. The ladder shall have a clear width of 350 mm and shall be provided with safety hoops at 500 mm centres supported by 3 No 25 x 5 mm stays over the full length. The safety cage shall extend for a distance of 1,5 m above the cover level of the tank. The catladder shall be hot-dipped galvanised in accordance with SABS 763.

PET 2.*3* Float Level Indicator

The tank shall be provided with a float level indicator with gauge plate to be approved by Engineer. The gauge plate shall be 200 mm wide and manufactured from 16 gauge mild steel plate. The background shall be white baked enamel with the graduations in black baked enamel in accordance with the details on drawing 11453/09. Bolt holes shall be provided prior to enamelling.

PET 2.4 Lightning Protection

Lightning protection will consist of 75 mm wide x 6 mm thick stranded copper conducting tape fixed to the tank supports on the one side and on the other side to a 20 mm diameter x 1 200 mm long copper earth spike driven into the ground next to the concrete.**PET 2.5** ***Concrete Foundations***

Concrete foundations shall be from class 25/19 MPa concrete. 220 brick walls constructed from face brick 0,9 m high and spaced at 1,2 m shall be utilised to lift the steel tank from the natural ground level.

PET 3 Construction

PET 3.1 *Tank*

Tank panels will be assembled on site and hoisted into position on the tank stand platform. The necessary care and precaution shall be taken to ensure that the tank or components thereof are property secured to the tank stand to avoid damages due to wind or other causes when the tank is empty during construction or thereafter.

PET 3.2 Catladder, Level Indicator, Pipework, Lightning Protection and Other Accessories

After erection of the tank in position on the tank foundation, all accessories such as the catladder, float level indicator, pipework and lightning protection will be installed.

PET 3.3 Tolerances

The complete installation shall be true to line and level with permissible deviations as follows :

a)	Vertical deviation of tank floor from true level when taken over a straight line along the length, width and diagonal of the tank floor.	:	± 5 mm
b)	Horizontal deviation of tank stand supports when taken 90 ° from true level over a length of 4 m along any support.	:	± 10 mm

PET 3.4 Disinfection

Upon completion of the installation the interior of the tank and all associated pipework shall be disinfected as follows :

a) The tank shall be flushed out with clean water until all sediment and other foreign matter have been removed.

b) The tank shall then be filled with water containing 0,15 g/l of calcium hypochlorite and shall be left there for at least 48 hours.

c) The tank shall then be thoroughly and repeatedly flushed with clean water until a sample of the washwater drawn form the tank complies with the requirements for potable water of the local authority or the authority supplying water to the area.

PET 4. Testing

The tank shall be hydraulically tested for water tightness by filling it with potable water to the full supply level (at overflow level). The same water used for disinfection of the tank, can be used for the water tightness testing. After 48 hours the tank shall be inspected for leakages and drop in water level. No visible leakages or drop in water level will be allowed. Should leakages occur the bolts shall be adjusted or other actions implemented and the tank will be retested. This procedure will be repeated until the tank is certified by the Engineer as being watertight.

PET 5. Measurement and Payment

PET 5.1 Supply, deliver, erection and corrosion protection sectional pressed steel tank with cover, access, two roof vents, catladder, 4 pipe connections complete on position as indicated on the drawings…… ……..….Unit : No

The complete water tank and stand assembly shall be measured and paid for by number in accordance with the capacity and/or dimensions specified for the tank as well as height of tank stand. Payment shall be for the supply and delivery of all materials and complete installation of the following components :

a) Pressed steel tank, including manhole, four flanged pipe connections, two roof vents, and corrosion protection.

b) Catladder complete with safety cage and corrosion protection.

PET 5.2 Supply and install Float Level Indicator ……. Unit : No

Level indicators shall be measured and paid for by number installed completely as detailed.

PET 5.3 Supply and install Lightning Protection ……. Unit : No

Lightning protection will be measured and paid for by number installed completely as detailed.

PET 5.4 Disinfect of the tank ……..Unit : Sum

Disinfect of the water tank shall be measured and paid for as a lump sum in accordance with the dimensions of the tank upon successful disinfect of the tank.

PET 5.5 Test for Water Tightness of the tank ……..… Unit : Sum

Testing of water tightness of the tank shall be measured and paid for as a lump sum in accordance with the dimensions of the tank upon successful testing of the tank.

PET 5.6 Connect to existing (size of tank kl steel tank with a (size) mm flanged connection …… Unit : No

Shall be measured and paid by number of connections and shall include all labour, material, fittings and tools for the connecting to an existing steel tank with a specified mm flanged steel pipe section 400mm long and to be flanged both on the inside and outside of the steel tank after connecting to the tank. An access manhole as described in PET 2.1.3 in the roof of the steel tank above the connection shall also be included under this item.

PARTICULAR SPECIFICATION PC - PROVISION OF STRUCTURED TRAINING

CONTENTS

PC 01 SCOPE

This specification covers the requirements for the provision of the following training:

(a) Specified structured training to selected members of the workforce and small, medium and micro enterprises (SMME's) by an approved Training Service Provider as accepted by the Employer.

(b) Additional training deemed necessary by the Contractor, to members of the workforce and small, medium and micro enterprises (SMME's).

PC 02 INTERPRETATIONS

PC 02.01 **Supporting documents**

The tender rules, conditions of contract, standard, supplementary and specific specifications and project specifications and drawings shall *inter alia* be read in conjunction with this specification.

PC 02.02 **Application**

The provisions of this specification shall apply in respect of all workers and small, medium and micro enterprises other than the Contractor's key personnel, who are engaged on the execution of the works.

PC 03 ENGINEERING SKILLS TRAINING

PC 03.01 The Contractor shall, from the commencement of the contract, implement a structured training programme comprising of the training delivered by the selected subcontractor and any additional training as provided for by the Contractor, in which the various skills required for the execution and completion of the works are imparted to the workers, and where applicable, small, medium and micro enterprises engaged thereon, in a programmed and progressive manner. Selected workers shall be trained progressively throughout the duration of the contract in the various stages of a particular type of work.

PC 03.02 The skills training programme to be implemented by the selected subcontractor shall comply with the following minimum standards:

(a) Be accredited by the Civil Engineering Training Authority (CETA) or other institutions recognised by the Department of Labour, as being appropriate for application on this project. Accredited training refers to both the trainers as well as to the training materials.

(b) Be delivered by suitably qualified and experienced trainers accredited to do so.

PC 03.03 The Contractor shall provide with his tender, full details of any additional accredited and in-house training, viewed to be necessary by the Contractor, which he intends to implement at his own cost. These details shall include the following:

(a) The name of the accredited training institution and programme

(b) The various aspects of each type of training comprised in the programme

(c) The manner in which the training is to be delivered

(d) The numbers and details of the trainers to be utilised.

PC 03.04 The Contractor shall be responsible for the provision of the necessary items for the delivery of the specified and additional skills training programme, including the following:

(a) Sufficient skilled, competent and accredited trainers to deliver the additional training programme to workers in accordance with the training programme

(b) A suitably furnished venue

(c) Transport of the workers as required

(d) Tools, equipment, and teaching aids

(e) Stationery and all other necessary materials.

PC 03.05 **Selection of candidates**

(a) Members of the workforce will be selected by the Engineer, assisted by the Contractor and the Liaison Officer, to receive specific training as approved by the Engineer.

(b) The following will be taken into account in the selection of the workers to receive the specified training:

i. Previous experience (if any)
ii. Previous courses completed (if any)
iii. Module specific requirements.

PC 03.06 **Duration of training**

(a) The Contractor shall allow in his programme for the selected members of the workforce to be engaged in the specified training modules.

(b) Provision must also be made by the Contractor for members of the workforce to receive any additional training as provided for by the Contractor.

PC 03.07 All specified skills-related training shall take place only during normal working hours and the Contractor shall ensure that the selected workers are available at the appropriate times to undergo such training.

PC 03.08 Both the selected subcontractor's and the Contractor's additional training programme shall be subject to the approval of the Engineer, and if so instructed by the Engineer shall alter or amend the programme and course content to suit changing conditions on site and all changes in the Contractor's programme of work.

PC 03.09 The Contractor shall keep comprehensive records of the training given to each worker involved in training as well as the nature and number of each task executed by the worker and whenever required shall provide copies of such records to the Engineer.

PC 03.10 Workers shall be remunerated in respect of all time spent undergoing the specified training in terms of Clause D03.02, at the minimum specified wage as per BCCEI.

PC 03.11 **Use of workers**

The Contractor shall, in so far as it is reasonably feasible take due cognisance of the nature of the works to be executed at any given time, and use trained workers on those aspects of the works for which they have been trained.

PC **04 GENERIC TRAINING**

PC 04.01 The Contractor shall, from the commencement of the contract, implement a structured progressive training programme comprising of the training delivered by the selected subcontractor and any additional training as provided for by the Contractor. Selected workers shall be trained progressively throughout the duration of the contract.

PC 04.02 The generic training programme is to be implemented by a training subcontractor to be nominated by the Engineer, upon the instruction of the Employer's Capex Programme Manager.

PC 04.03 The Contractor shall provide with his tender, full details of any additional recognised and in-house training viewed to be necessary by the Contractor, which he intends to implement at his own cost. These details shall include the following:

(a) The name of the training institution and programme

(b) The various aspects of each type of training comprised in the programme

(c) The manner in which the training is to be delivered

(d) The numbers and details of the trainers to be utilized.

PC 04.04 The Contractor shall be responsible for the provision of the necessary items for the delivery of the specified and additional generic training programme, including the following:

(a) A suitably furnished venue

(b) Transport of the workers as required

(c) Tools, equipment, and teaching aids

(d) Stationery and all other necessary materials.

PC 04.05 All generic training shall take place outside of normal working hours.

PC 04.06 The Contractor's training programme, if any, shall be subject to the approval of the Engineer, and if so instructed by the Engineer shall alter or amend the programme and course content.

PC 04.07 The Contractor shall keep comprehensive records of the training given to each worker involved in training and whenever required shall provide copies of such records to the Engineer.At the successful completion of each course provided by the Contractor each student shall be issued with a certificate indicating the course contents as proof of attendance and completion.

PC 04.08 No remuneration in respect of time spent undergoing training in terms of this Clause will be made to any of the workers.

PC 05 ENTREPRENEURIAL SKILLS TRAINING

PC 05.01 Training needs assessments of the Contractor and his sub-contractors will be undertaken during the course of the Contract by a sub-contractor to be nominated by the Engineer, on the instruction of the Employer's Capex Programme Manager. The training needs assessments shall have as their focus contractor development, and shall identify needs for business development, business management and technical construction management skills. Such training needs may be identified in personnel both in the permanent employ of the Contractor and/or his sub-contractors, as well as temporary employees thereof.

PC 05.02 Once the needs assessments have been completed, training to meet the needs identified in the assessment phase will be provided, again by a sub-contractor to be nominated by the Engineer, upon the instruction of the Employer's Capex Programme Manager.

PC 05.03 The Contractor shall assist in facilitating in the delivery of the training, by instructing and motivating personnel and subcontractors regarding attendance and participation therein.

PC 05.04 The Contractor shall further make all reasonable efforts to co-ordinate the programming of the subcontractor's work with that of the delivery of the structured training.

PC 05.05 Following completion of the structured training, members of small, medium and micro contractors/subcontractors that have demonstrated understanding of and competence in the training material are to be appropriately certified by the accrediting body.

PC 05.06 The Contractor shall provide with his tender, full details of any additional accredited and in-house training, viewed to be necessary by the Contractor, which he intends to implement at his own cost. These details shall include the following:

(a) The name of the training institution and programme

(b) The various aspects of each type of training comprised in the programme

(c) The manner in which the training is to be delivered

(d) The numbers and details of the trainers to be utilized.

PC 05.07 The Contractor shall be responsible for the provision of the necessary items for the delivery of the entrepreneurial training programme, including the following:

(a) A suitably furnished venue

(b) Transport of the subcontractors as required

(c) Tools, equipment, and teaching aids

(d) Stationery and all other necessary materials.

PC 05.08 All specified entrepreneurial training shall take place within normal working hours.

PC 05.09 The Contractor's training programme, if any, shall be subject to the approval of the Engineer, and if so instructed by the Engineer shall alter or amend the programme and course content.

PC 05.10 The Contractor shall keep comprehensive records of all training given to personnel and subcontractors involved in training and whenever required shall provide copies of such records to the Engineer. At the successful completion of each course each subcontractor shall be issued with a certificate indicating the course contents as proof of attendance and completion.

PC 05.11 No remuneration in respect of time spent undergoing specified training in terms of this Clause will be made to any of the subcontractors.

PC 06 MEASUREMENT AND PAYMENT

PC 06.01 **Basic principles**

(a) General

Measurement and payment for all work executed in terms of this contract shall be measured and paid for in accordance with the principles set out in Clause D 06.02 of the project specifications, irrespective of whether the work is executed as an integral part of the provision of training in terms of this specification.

(b) Training

The Contractor shall only be reimbursed for the amounts actually paid by the Contractor to the selected subcontractors appointed as directed by the Employer, in execution of the Engineer's written instruction, plus a percentage as tendered to cover all his charges and profits.

PC 06.02 **Scheduled items**

Payment items are included in the Bill of Quantities under Section 1200 for the provision of the specified training by selected subcontractors only. Any additional training as viewed by the Contractor to be necessary shall be viewed to be included under Section 1300 and shall not be paid for separately.

Item **Unit**

PC 06.03 **Training:**

(a) Engineering (technical) skills ..... Provisional Sum

(b) Generic skills ..... Provisional Sum

(c) Training venue ..... Provisional sum

(d) Contractor's handling costs, profit and all other charges in respect of subitems D 06.03(a),(b) and (c):

(i) Technical skills ..... percentage (%)

(ii) Generic skills ..... percentage (%)

(iii) Training venue ..... percentage (%)

(e) Training allowance paid to targeted labour i.r.o. formal training (equal to pay for 1 day of task) .....person days

(f) Extra over (e) for the administration of payment of training allowances to targeted labour. .....person days

(g) Transport and accommodation of workers for training where it is not possible to undertake the training in close proximity of the site. ..... Provisional Sum

(h) Contractor's handling costs, profit and all other charges in respect of subitem (g) .....percentage (%)

Payment under subitems PC 06.03(a) and (b) shall be the amounts actually paid to the training institutions and shall be made in accordance with the provisions of the General Conditions of Contract.

The provisional sum for subitem PC 06.03 (c) shall include full compensation for the provision of a suitable training venue, for all necessary lighting, furniture, stationery, consumables and study material, and for transportation of the workers to and from the training venue. Payment of the provisional sum shall be made in accordance with the provisions of the General Conditions of Contract:

The percentages tendered for subitem PC 06.03 (d) shall be the percentages of the amounts actually reimbursed to the Contractor under subitems PC 06.03 (a), (b) and (c) and shall be in full and final compensation in respect of the Contractor's handling costs, profit, mentoring, record keeping, reporting and all other charges in connection with providing the services.

Payment under subitem PC 06.03 (e) shall be the actual sum paid to workers undergoing training. The Contractor will be reimbursed directly for his administrative costs under subitem PC 06.03 (f).

Payment under subitems PC 06.03(g) shall be the amount actually paid for transporting the labourers to the training venue and shall be made in accordance with the provisions of the General Conditions of Contract.

The percentages tendered for subitem PC 06.03 (h) shall be the percentage of the amount actually reimbursed to the Contractor under subitem PC 06.03 (g) and shall be in full and final compensation in respect of the Contractor's handling costs, profit and all other charges in connection with providing the transport.

PARTICULAR SPECIFICATION: PD PROVISION OF TEMPORARY WORKFORCE

CONTENTS

PD 01 SCOPE

This Specification covers the provisions and requirements relating to the provision of the temporary workforce.

PD **02 INTERPRETATIONS**

PD 02.01 Supporting documents

The Tender Rules, Conditions of Contract, Standard and Project Specifications, Drawings and statutory minimum requirements relating to the employment and remuneration of labour shall *inter alia* be read in conjunction with this Specification.

PD 02.02 Definitions and abbreviations

For the purposes of this specification, the definitions given in the Conditions of Contract, the Standard Specifications and the Project Specifications, together with the following additional definitions shall, unless the context dictates otherwise, apply:

(a) **"Key Personnel"** means all contracts managers, site agents, materials and survey technicians, trainers, supervisors, foremen, skilled plant operators, artisans and the like, and all other personnel in the permanent employ of the Contractor or Subcontractor who possess special skills and/or who play key roles in the Contractor's or Subcontractor's operation

(b) **"Project Committee"** means a committee consisting of the Employer, the Engineer, the Contractor, (or their nominated representatives) as well as representatives of the temporary workforce, which is convened from time to time at the discretion of the Engineer, for the purposes of acting as an avenue for effective communication and liaison between all the parties referred to, in all matters pertaining to the Contract

(c) **"Subcontractor"** means any person or group of persons in association, or firm, or body corporate (whether formally constituted or otherwise) not being the Contractor, to whom specific portions or aspects of the Works are sublet or subcontracted by the Contractor in accordance with the provisions of the Contract

(d) **"Worker"** for the purposes of this Specification means any person, not being one of the Contractor's key personnel, nor any key personnel of any Subcontractor, who is engaged by the Contractor, a Subcontractor or the Employer to participate in the execution of any part of the Contract Works and shall include unskilled labour, semi-skilled and skilled labour, clerical workers and the like

(e) **"Workforce"** means the aggregate body comprising all workers and shall, unless the context dictates otherwise, include the workforces of the Contractor and all Subcontractors

(f) **"Liaison Officer"** means a representative from the temporary workforce, duly elected by them, to act on their behalf and through whom all matters pertaining to the temporary workforce can be channelised.

PD 02.03 Status

Where any provisions or requirements of this Specification are in conflict with anything elsewhere set out in the Contract, the provisions and requirements of this Specification shall take precedence and prevail.

PD 03 PERMITTED SOURCES OF TEMPORARY WORKERS

The Contractor shall as far as possible make optimum use of the human resources outside his own workforce and the workforces of all subcontractors. The temporary workforce that is to be used in the execution of the Works in terms of Part A may consist of the workers of various communities, and shall not be bound to one particular community.

PD 04 EMPLOYMENT RECORDS TO BE PROVIDED

(a) The Contractor shall maintain accurate and comprehensive records of all workers engaged on the Contract and shall provide the Engineer at monthly intervals from the commencement of the Contract, with interim records substantiating the actual numbers of employment opportunities that shall have been generated to date and the amounts actually paid in respect thereof. Such interim records shall be in a format approved by the Engineer.

(b) The Contractor shall, on completion of the Contract, and as a pre-requisite event to the release of any retention money in terms of the Conditions of Contract, provide the Engineer with copies of the Terms of Employment as well as independently audited documentary evidence of the total number of temporary and permanent employment opportunities actually generated during the Contract.

PD 05 VARIATIONS IN WORKER PRODUCTION RATES

Notwithstanding anything to the contrary as may be stated in or inferred from any other provision of this Contract, the Contractor shall not be entitled to any additional payment or compensation whatever, in respect of any differences as may result between the production rates actually achieved by workers in the course of the execution of the Contract Works and those production rates on which he has based his tender.

PD 06 TRAINING OF THE TEMPORARY WORKFORCE

(a) Selected members of the workforce are to be provided with structured training in accordance with the provisions of Part D.

(b) The Contractor shall make all necessary allowances in his programme of work to accommodate and facilitate the delivery of such structured training and shall comply fully with the requirements of Part D.

(c) The provision of structured training as described in Part D shall not relieve the Contractor of any of his obligations in terms of the Conditions of Contract and the Contractor shall remain fully liable for the provision, at his own cost, of all training of the workforce, additional to that as provided for in Part D, as may be necessary to achieve the execution and completion of the works strictly in accordance with the provisions of the Contract.

PD 07 RECRUITMENT AND SELECTION PROCEDURES

PD 07.01 The Contractor shall be fully responsible for the recruitment and selection of workers to constitute the temporary workforce.

PD 07.02 The Contractor shall advise the Engineer in writing of the numbers of each category of temporary worker which he requires, together with the personal attributes which he considers desirable that each category of worker shall posses (taking due cognisance of the provisions of the Contract relating to training).

PD 07.03 The Contractor shall, at his own cost, take all necessary actions to advertise within the communities comprising the personnel resources, the fact that temporary employment opportunities exist and the time and place where recruiting will occur.

PD 07.04 The Contractor shall record in writing, the details of all persons applying for employment, including *inter alia*:

(a) Name, address, age and sex
(b) Marital status and number of dependants
(c) Qualifications and previous work experience (whether substantiated or not)
(d) Period since last economically active
(e) Preference for type of work or task.

PD 07.05 The Contractor shall make his selection of workers from amongst the applicants, taking due cognisance of his requirements for the workforce and the provisions of the contract in regard to the provision of training to the workforce and in accordance with the following principles:

(a) No potential temporary worker shall be precluded from being employed by the Contractor on the execution of the Works, by virtue of his lack of skill in any suitable operation forming part of the Works, unless-

(i) all available vacancies have been or can be filled by temporary workers who already posses suitable skills, or

(ii) the Time for Completion allowed in the Contract, or the remaining portion of the Contract Period (as the case may be) is insufficient to facilitate the creation of the necessary skills.

(b) Preference shall be given to the unemployed and single heads of households.

(c) The Contractor shall, in so far as is reasonably practicable, give priority to accommodating the applicants' expressed preferences regarding the types of work for which they are selected.

(d) The selection process shall not be prejudicial to youth (over the age of fifteen years) and women.

PD 07.06 After making his selection, the Contractor shall advise the Engineer thereof, in writing and the Engineer shall, without undue delay, ratify the Contractor's selection.

PD 07.07 The provisions of this clause shall apply *mutatis mutandis* in respect of the selection of additional or replacement members of the workforce as may be necessary from time to time during the Contract.

PD 07.08 The Contractor shall, after selecting his temporary workforce, arrange at his own cost for the appointment of the Liaison Officer as representative of the workforce to act on their behalf with regards to all matters pertaining to the workforce."

PD 08 TERMS AND CONDITIONS PERTAINING TO THE EMPLOYMENT OF THE TEMPORARY WORKFORCE

PD 08.01 All temporary workers engaged in accordance with the provisions of Part A of the Project Specifications, shall be employed on the terms and conditions of employment as are consistent with those as set out in this Contract. The Contractor shall implement and adhere strictly to such terms and conditions relating to the employment of the temporary workforce, and subject only to the provisions of this Contract, shall not employ any temporary worker on terms and conditions which are less favourable to the worker or inconsistent with the standards and norms generally applicable to temporary workers in the Civil Engineering Industry and applicable to the particular area.

PD 08.02 The Contractor shall pay to all temporary workers engaged in terms of Part A of the Project Specifications, not less than the minimum rate of remuneration as specified in Part A – General Clause A17.2.

PD 09 LABOUR RELATIONS AND WORKER GRIEVANCE PROCEDURES

PD 09.01 The Contractor, as the Employer of the workforce, shall be fully responsible for the establishment and maintenance at his own cost, of satisfactory labour relations on site and the resolution of all grievances of temporary workers as may occur.

PD 09.02 The Contractor shall at all times adhere to the accepted norms and standards of labour relations prevailing generally in the Civil Engineering Construction Industry and shall conduct himself in a fair and reasonable manner, within the constraints as may be imposed upon him by the terms of the Contract.

PD 09.03 In the event of any temporary worker engaged by the Contractor in terms of the Contract, being aggrieved with regard to his Terms of Employment, working conditions and training, he shall have the right, at his discretion, to be supported in any inquiry or disciplinary hearing or investigation instituted by the Contractor in terms of Subclause C 09.02 above, by one member of the temporary workforce and one member of the Project Committee, which persons shall be nominated by the worker.

PD 09.04 In the event of any grievance not being satisfactorily resolved through the application of normal dispute resolution procedures in accordance with Subclauses C 09.02 and C 09.03, then either the Contractor or the worker concerned may require that the matter be referred to the Project Committee for further consideration, with a view to facilitate the resolution thereof.

PD 10 THE SUBCONTRACTORS' WORKFORCES

PD 10.01 The provisions of this Part C shall apply *mutatis mutandis* to the workforces employed by all subcontractors engaged by the Contractor and the Contractor shall be fully responsible for ensuring, at his own cost, that the terms of every subcontract agreement entered into are such as to facilitate the application of these provisions in respect of the workforces of all subcontractors.

PD 10.02 The Contractor shall at his own cost and to the extent necessary, assist and monitor all subcontractors in the application of the provisions of this Specification, and shall, in terms of the Conditions of Contract, remain fully liable in respect of the acts, omissions and neglects of all subcontractors, in respect of the application of the provisions of this Specification.

PD 11 PROJECT LIAISON OFFICER (PLO)

The Contractor or his appointed agent will appoint a Project Liaison Officer (PLO) after consultation with the local communities, the Engineer and the Employer. The Contractor shall direct all his liaison

efforts with the local communities through the appointed officer. The Contractor shall, however, accept the appointed as part of his management personnel.

PD 11.01 Duties of the Project Liaison Officer

The Community Liaison Officer's duties will be:

(i) To be available on site daily between the hours of 07:00 and 18:00 and at other times as the need arises. His normal working day will extend from 07:00 in the morning until 18:00 in the afternoon.

(ii) To determine, in consultation with the Contractor, the needs of the temporary labour for relevant skills training. He will be responsible for the identification of suitable trainees and will attend one of each of the training sessions.

(iii) To communicate daily with the Contractor and the Engineer to determine the labour requirements with regard to numbers and skill, to facilitate in labour disputes and to assist in their resolution.

(iv) To assist in and facilitate in the recruitment of suitable temporary labour and the establishment of a "labour desk".

(v) To attend all meetings in which the community and/or labour are present or are required to be represented.

(vi) To assist in the identification, and screening of labourers from the community in accordance with the Contractor's requirements.

(vii) To inform temporary labour of their conditions of temporary employment and to inform temporary labourers as early as possible when their period of employment will be terminated.

(viii) To attend disciplinary proceedings to ensure that hearings are fair and reasonable.

(ix) To keep a daily written record of his interviews and community liaison.

(x) To attend monthly site meetings to report on labour and RDP matters.

(xi) All such other duties as agreed upon between all parties concerned.

(xii) To submit monthly returns regarding community liaison in a format prescribed by the Engineer.

PD 11.02 Payment for the project liaison officer

A special pay item is incorporated in section 1200 of the Bill of Quantities relating to payment of the liaison officer on a prime cost sum basis. This payment shall only be made for the period for which the duties of the liaison officer are required and not necessarily for the full duration of the contract. The remuneration of the PLO shall be determined jointly by the Contractor, Engineer and Employer.

PD 11.03 Period of employment of the project liaison officer

The period of employment of the community liaison officer shall be as decided upon jointly by the Contractor, Engineer and Employer.

PD 12 MEASUREMENT AND PAYMENT

The Contractor will not be separately reimbursed or compensated in respect of the provision of the workforce and creation of temporary employment opportunities and all the Contractor's costs associated with compliance with the provisions of this part of the Project Specifications shall, except to the extent provided for as relevant, be deemed to be included in the rates tendered for in Section 1300 of the Bill of Quantities.

Item **Unit**

PD 12.01 Remuneration of the Project Liaison Officer and members of the Project Liaison committee:

(a) Project Liaison Officer(s)..... Prime cost (PC) sum

(b) Project Liaison Committee ..... Prime cost (PC) sum

(c) Contractor's charge to allow for handling costs and profit in respect ofsubitem C12.01(a) and (b):

(i) Project Liaison Officer(s) ..... percentage (%)

(ii) Project Liaison Committee ..... percentage (%)

Payment under the Prime cost (PC) sum provided in subitem C12.01(a) and (b) to cover the employment and remuneration of the Project Liaison Officer(s) and the attendant members of the Project Liaison Committee established by the Contractor, shall be effected in accordance with the provisions of Clause 6.6 of the General Conditions of Contract.

The tendered percentage in subitem PD12.01(c) is the percentage of the amount actually spent under subitem PD12.01(a) and (b) that will be paid to the Contractor in full compensation for the Contractor's handling costs and profit in respect of the employment and remuneration of the Liaison Officer(s) and Liaison Committee.

PARTICULAR SPECIFICATION PE: HIV/AIDS SPECIFICATION

CONTENTS

PE 01 SCOPE

PE 01.01 This specification contains all requirements applicable to the Contractor for creating HIV/AIDS awareness amongst all of the Workers involved in this project for the duration of the construction period, through the following strategies: This should be read in conjunction with the OHS consultant specification which shall be applicable should there be a conflicting statement.

PE 01.02 Raising awareness about HIV/AIDS through education and information on the nature of the disease, how it is transmitted, safe sexual behaviour, attitudes towards people affected and people living with HIV/AIDS, how to live a healthy lifestyle with HIV/AIDS, the importance of voluntary testing and counselling, the diagnosis and treatment of Sexually Transmitted Infections, and the closest health service providers.

PE 01.03 Informing Workers of their rights with regard to HIV/AIDS in the workplace.

PE 01.04 Providing Workers with access to condoms and other awareness material that will enable construction Workers to make informed decisions about sexual practices.

PE 02 DEFINITIONS AND ABBREVIATIONS

PE 02.01 **Definitions**

Service Provider:	The natural or juristic person recognised and approved by the Department of Public Works and Roads as a specialist in conducting HIV/AIDS awareness programmes.
Service Provider Workshop Plan:	A plan outlining the content, process and schedule of the training and education workshops presented by a Service Provider, which has been approved by the Representative/Agent.
Worker:	Persons in the employ of the Contractor or under the direction or supervision of the Contractor or any of his sub-contractors, who are on site for a minimum period of 30 days in all.

PE 02.02 **Abbreviations**

HIV : Human Immunodeficiency Virus.

AIDS : Acquired Immune Deficiency Syndrome.

STI : Sexually Transmitted Infection.

PE 03 BASIC METHOD REQUIREMENT

PE 03.01 The Contractor shall, through a Service Provider, conduct onsite workshops with the Workers.

PE 03.02 The Service Provider shall develop and compile a Service Provider Workshop Plan to be presented at the workshops and which will be best suited for this project to achieve the specified objectives with regards to HIV/AIDS awareness. The Contractor shall submit the Service Provider Workshop Plan for approval within 21 days after the tender acceptance date. After approval by the Department's Tender Committee, the Contractor shall make available an appropriate venue that will be conducive to education and training.

PE 03.03 The Service Provider Workshop Plan shall address, but will not be limited to the following:

(a) The nature of the disease;
(b) How it is transmitted;
(c) Safe sexual behaviour;
(d) Post exposure services such as voluntary counselling and testing (VCT) and nutritional plans for people living with HIV/AIDS;
(e) Attitudes towards other people with HIV/AIDS;
(f) Rights of the Worker in the workplace;
(g) How the awareness champion will be equipped prior to commencement of the HIV/AIDS awareness programme with basic HIV/AIDS information and the necessary skills to handle questions regarding the HIV/AIDS awareness programme on site sensitively;
(h) How the Service Provider will support the awareness champion;
(i) Location and contact numbers of the closest clinics, VCT facilities, counselling services and referral systems;
(j) How the workshops will be presented, including frequency and duration;
(k) How the workshops will fit in with the construction programme;
(l) How the Service Provider will assess the knowledge and attitude levels of attendees to structure workshops accordingly;
(m) How the video will be used;
(n) How the Service Provider will elicit maximum participation from the Workers;
(o) A questions and answers slot (interactive session).

The Service Provider Workshop Plan shall encompass the Specific Learning Outcomes (SLO) as stipulated

PE 04 HIV/AIDS AWARENESS EDUCATION AND TRAINING

PE 04.01 Workshops

The Contractor shall ensure that all the Workers attend the workshops.

The workshops shall adequately deal with all the aspects contained in the Service Provider Workshop Plan. In order to enhance the learning experience, groups of not exceeding 25 people shall attend the interactive sessions of the workshops.

PE 04.02 Recommended practice

Workshop Schedule

Presenting information contained in the Service Provider Workshop Plan can be divided in as many workshop sessions as deemed practicable by the Contractor, provided that all Workers are exposed to all aspects of the workshops as outlined in the Service Provider Workshop Plan.

Breaking down the content of information to be presented to Workers into more than one workshop session however, has the added advantage that messages are reinforced over time while providing

opportunity between workshop sessions for Workers to reflect and test information. Workers will also have an opportunity to ask questions at a next session.

An attendance register should be kept by the Service Provider at every workshop and should be handed to the Department's Project Manager on a monthly basis together with Process Indicator Forms.

Service Providers

A data base of recommended Service Providers is available from the Department of Public Works, Private Bag X65, Pretoria, 0001, located at the Central Government Offices, corner of Bosman and Vermeulen Streets, Pretoria and at all Public Works Regional Offices.

HIV/AIDS Specific Learning Outcomes and Assessment Criteria

Workers shall be exposed to workshops for a minimum duration of two-and-a-half hours. In order to set a minimum standard requirement, the following specific learning outcomes and assessment criteria shall be met:

(a) UNIT I: The nature of HIV/AIDS

After studying and understanding this unit the Worker will be able to differentiate between HIV and AIDS and comprehend whether or not it is curable. The Worker will also be able to explain how the HI virus operates once a person is infected and identify the symptoms associated with the progression of HIV/AIDS.

Assessment Criteria:

1. Define and describe HIV and AIDS
2. List and describe the progression of HIV/AIDS

(b) UNIT 2: Transmission of the HI virus

After studying and understanding this unit the Worker will be able to identify bodily fluids that carry the HI virus. The Worker will be able to recognise how HIV/AIDS is transmitted and how it is not transmitted.

Assessment Criteria:

1. Record in what bodily fluids you will find the HI virus.
2. Describe how HIV/AIDS can be transmitted.
3. Demonstrate your ability to distinguish between how HIV/AIDS is transmitted and misconceptions around transmittance of HIV/AIDS.

(c) UNIT 3: HIV/AIDS preventative measures

After studying and understanding this unit the Worker will comprehend how to act in a way that would minimise the risk of HIV/AIDS infection and to use measures to prevent the HI virus to enter the blood stream.

Assessment Criteria:

1. Report on how you could minimise your risk of HIV/AIDS infection.
2. Report on precautions that can be taken to prevent HIV/AIDS infection.

3. Explain or demonstrate how to use a male and female condom.
4. List of factors that could jeopardize the safety condoms provide against HIV/AIDS transmission.

(d) UNIT 4: Voluntary HIV/AIDS counselling and testing

After studying and understanding this unit the Worker will be able to recognise methods of testing for HIV/AIDS infection. The Worker will be able to understand the purpose of voluntary HIV/AIDS testing and pre- and post-test counselling.

Assessment Criteria:

1. Describe kinds of testing for HIV/AIDS infection.
2. Report on why voluntary testing is important.
3. Report on why pre- and post-test counselling is important.

(e) UNIT 5: Living with HIV/AIDS

After studying and understanding this unit the Worker will be able to recognise the importance of caring for people living with HIV/AIDS and be able to manage HIV/AIDS.

Assessment Criteria:

1. List and describe ways to manage HIV/AIDS.
2. Describe nutritional needs of people living with HIV/AIDS.
3. Describe ways to embrace a healthy lifestyle as a person living with HIV/AIDS.
4. Explain the need of counselling and support to people living with HIV/AIDS.

(f) UNIT 6: Treatment options for people with HIV/AIDS

After studying and understanding this unit the Worker will be familiar with the various treatments available to HIV/AIDS infected or potentially HIV/AIDS infected people.

Assessment Criteria:

1. Discuss anti-retroviral therapy
2. List methods of treatment to prevent HIV/AIDS transmission from mother-to-child.
3. Describe the need for treatment of opportunistic diseases for people living with HIV/AIDS.
4. Describe post exposure prophylactics.

(g) UNIT 7: The rights and responsibilities of Workers in the workplace with regards to HIV/IAIDS

After studying and understanding this unit the Worker will be able to identify the rights and responsibilities of the Worker living with HIV/AIDS in the workplace. The Worker will recognise the importance of accepting colleagues living with HIV/AIDS and treating them in a non- discriminative way.

Assessment Criteria:

1. Discuss the rights of a person living with HIV/AIDS in the workplace.
2. Discuss the responsibilities of a person living with HIV/AIDS in the workplace.
3. Report on why acceptance and non-discrimination of colleagues living with HIV/AIDS is important.

PE 04.03 **Displaying of plastic laminated posters and distribution of information booklets**

(a) The Contractor shall obtain a set of four posters conveying different key messages, and information booklets from the Construction Industry Development Programme Unit (CIDP), Room A520 located in the Central Government Offices, corner of Bosman and Vermeulen Streets, Pretoria or at all Regional Offices of the Department of Public Works. The postal address is the Department of Public Works, Private Bag X65, Pretoria, 0001.
(b) The above-mentioned posters and information booklets have been prepared to raise awareness and to share information about HIV/AIDS and STI's.
(c) Posters or display stands shall be displayed on site as soon as possible but not later than 14 days after the date of site hand over.
(d) Posters shall be displayed in areas highly trafficked by Workers, including toilets, rest areas, the site office and compounds.
(e) The posters on display should always be intact, clear and readable.
(f) Information booklets must be distributed to all Workers as soon as possible but not later than 14 days after site hand over, or as soon as the Worker joins the site.

PE 05 PROVIDING WORKERS WITH ACCESS TO CONDOMS

PE 05.01 The Contractor shall provide and maintain condom dispensers and make both male and female condoms complying with the requirements of SANS 4074:2003 available at all times to all Workers at readily accessible points on site, for the duration of the contract. The Contractor may obtain condom dispensers from the Department of Health and condoms may be obtained from the local clinic or the Department of Health.

PE 05.02 At least one male and one female condom dispenser and a sufficient supply of condoms, all to the approval of the Representative/Agent, shall be on site within 14 days of site hand over. Contractors should note that arrangements to obtain condoms from the Department of Health Clinics prior to site hand over may be necessary to ensure that condoms are available within 14 days of site hand over.

PE 05.03 Condoms shall be made available in areas highly trafficked by Workers, including toilets, the site office and compounds.

PE 06 ENSURING ACCESS TO HIV/AIDS TESTING AND COUNSELLING FACILITIES AND TREATMENT OF SEXUALLY TRANSMITTED INFECTIONS (STI)

PE 06.01 The Contractor shall provide the Workers with the names of the closest Service Providers that provide HIV/AIDS testing and counselling and Clinics providing Sexually Transmitted Infection (STI) diagnosis and treatment. Information on these Service Providers and Clinics should be displayed on a poster of a size not smaller than A1 in an area highly trafficked by Workers.

PE 07 APPOINTMENT OF AN HIV/AIDS AWARENESS CHAMPION

PE 07.01 Within 14 days of site hand over the Contractor shall appoint an Awareness Champion, from, amongst the Workers, who speaks and understands all the languages spoken by the Workers and he/she shall be on site during all stages of the construction period. The Contractor shall ensure that the Awareness Champion has been trained by the Service Provider on basic HIV/AIDS information, the support services available and the necessary skills to handle questions regarding the HIV/AIDS programme in a sensitive way.

The Awareness Champion shall be responsible for:

(a) Liaising with the Service Provider on organising awareness workshops;
(b) Filling condom dispensers and monitoring condom distribution;
(c) Handing out information booklets;
(d) Placing and maintaining posters

PE 08 MONITORING

PE 08.01 The Contractor shall grant to the Representative/Agent reasonable access to the construction site in order to conduct unannounced site visits in order to establish that the Contractor complies with his obligations regarding HIV/AIDS awareness under this contract.

PE 08.02 The Representative/Agent shall conduct the site visits with the least possible disruption to the Contractor's daily routine.

PE 08.03 Contractors must report problems that they experience in implementing the HIV/AIDS requirements to the Representative/Agent.

PE 08.04 A SITE CHECKLIST (SCHEDULE A) shall be completed and submitted at every construction progress inspection to the Representative/Agent.

PE 08.05 A SERVICE PROVIDER REPORT (SCHEDULE B) shall be completed and submitted on a monthly basis to the Department's Project Manager through the Representative/Agent.

PE 08.06 The Contractor shall, at the end of the contract, complete and submit a close out programme report CONTRACTOR HIV/AIDS PROGRAMME REPORT (SCHEDULE C).

PE 09 MEASUREMENT AND PAYMENTS

PE 09.01 It is required of tenderers to thoroughly study the HIV/AIDS Specifications of the Department that must be read together with and is deemed to be incorporated in the Bill of Quantities. Provision for pricing of HIV/AIDS awareness must be made under Item E10.01 hereafter and it is explicitly pointed out that all requirements of the aforementioned specifications are deemed to be priced hereunder as the said item represents the only method of measurement and no additional items or extras to the contract in this regard shall be entertained.

PE 09.02 Contractor should take note that compliance with the HIV/AIDS Specification is compulsory. In the event of partial or total non-compliance, the Representative /Agent, notwithstanding the provisions of any other clause to the contrary, reserves the right to delay issuing any progress payment certificate until the Contractor provides satisfactory proof of compliance. The Contractor shall not be entitled to any compensation of whatsoever nature, including interest, due to such delay of payment

Item **Unit**

PE **10.01 HIV AIDS Awareness obligations** ..... Lump Sum

The tendered lump sum shall be in full compensation for the Contractor providing an approved selected service provider to comply with the requirements and conditions of the Department's HIV/AIDS Specifications, including the workshop education and training within an HIV/AIDS Awareness programme and the Contractor's handling costs, profit, record keeping, reporting and all other charges in connection with providing the HIV/AIDS Awareness programme.

Payment under item E10.01 will be made as follows:

80% of the amount will be paid once the service provider has complied with the requirements and conditions of the Department's HIV AIDS Specifications, including the workshop education and training within an HIV/AIDS Awareness programme.

The outstanding 20% will be paid on completion of the contract, subject to the Contractor's compliance in all respects with the requirements and conditions of the Department's HIV/AIDS Specifications.

PARTICULAR SPECTIFICATION PF - GENERIC LABOUR-INTENSIVE SPECIFICATION

CONTENTS

PF 01 SCOPE

This specification establishes general requirements for activities, which are to be, executed by hand involving the following:

(a) trenches having a depth of less than 1.5 metres
(b) storm water drainage
(c) low-volume roads and sidewalks

PF F 02 PRECEDENCE

Where this specification is in conflict with any other standard or specification referred to in the Scope of Works to this Contract, the requirements of this specification shall prevail.

PF 03 HAND EXCAVATEABLE MATERIAL

Hand excavatable material is material:

(a) Granular materials:

(i) Whose consistency when profiled may in terms of Table 1 be classified as very loose, loose, medium dense, or dense; or

(ii) Where the material is gravel having a maximum particle size of 10 mm and contains no cobbles or isolated boulders, no more than 15 blows of a dynamic cone penetrometer is required to penetrate 100mm;

(b) Cohesive materials:

(i) whose consistency when profiled may in terms of Table 1 be classified as very soft, soft, firm, stiff and stiff / very stiff; or

(ii) where the material is gravel having a maximum particle size of 10 mm and contains no cobbles or isolated boulders, no more than 8 blows of a dynamic cone penetrometer is required to penetrate 100 mm;

Note: (1) A boulder, a cobble and gravel is material with a particle size greater than 200 mm, between 60 and 200 mm.

(2) A dynamic cone penetrometer is an instrument used to measure the in-situ shear resistance of a soil comprising a drop weight of approximately 10 kg, which falls through a height of 400 mm and drives a cone having a maximum diameter of 20 mm (cone angle of 60° with respect to the horizontal) into the material being used.

Table 1: Consistency of materials when profiled

GRANULAR MATERIALS		COHESIVE MATERIALS	
CONSISTENCY	**DESCRIPTION**	**CONSISTENCY**	**DESCRIPTION**
Very loose	Crumbles very easily when scraped with a geological pick.	Very soft	Geological pick head can easily be pushed in as far as the shaft of the handle.
Loose	Small resistance to penetration by sharp end of a geological pick.	Soft	Easily dented by thumb; sharp end of a geological pick can be pushed in 30-40 mm; can be moulded by fingers with some pressure.
Medium dense	Considerable resistance to penetration by sharp end of a geological pick.	Firm	Indented by thumb with effort; sharp end of geological pick can be pushed in up to 10 mm; very difficult to mould with fingers; can just be penetrated with an ordinary hand spade.
Dense	Very high resistance to penetration by the sharp end of geological pick; requires many blows for excavation.	Stiff	Can be indented by thumbnail; slight indentation produced by pushing geological picks point into soil; cannot be moulded by fingers.
Very dense	High resistance to repeated blows of a geological pick.	Very stiff	Indented by thumbnail with difficulty; slight indentation produced by blow of a geological pick point.

PF 04 LABOUR INTENSIVE WORKS

Trench excavation

All hand excavatable material in trenches having a depth of less than 1,5 metres shall be excavated by hand.

Compaction of backfilling to trenches (areas not subject to traffic)

Backfilling to trenches shall be placed in layers of thickness (before compaction) not exceeding 100 mm. Each layer shall be compacted using hand tampers

(a) To 90% Proctor density;
(b) Such that in excess of 5 blows of a dynamic come penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more than 10% gravel of size less than 10mm and contains no isolated boulders; or
(c) Such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

Excavation

All hand excavatable material including topsoil classified, as hand excavatable shall be excavated by hand. Harder material may be loosened by mechanical means prior to excavation by hand.

The excavation of any material, which presents the possibility of danger or injury to workers, shall not be excavated by hand.

Clearing and grubbing

Grass and small bushes shall be cleared by hand.

Shaping

All shaping shall be undertaken by hand.

Loading

All loading shall be done by hand, regardless of the method of haulage.

Haul

Excavation material shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150 m.

Offloading

All material, however transported, is to be off- loaded by hand, unless tipper-trucks are utilised for haulage

Spreading

All material shall be spread by hand.

Compaction

Small areas may be compacted by hand provided that the specified compaction is achieved.

Grassing

All grassing shall be undertaking by sprigging, sodding, or seeding by hand.

Stone pitching and rubble concrete masonry

All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, must to be collected, loaded, off loaded and placed by hand.

Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150 m.

Grout shall be mixed and placed by hand.

Manufactured Elements

Elements manufactured or designed by the Contractor, such as manhole rings and cover slabs, pre-cast concrete planks and pipes, masonry units and edge beams shall not individually, have a mass of more than 320 kg. In addition, the items shall be large enough so that four workers can conveniently and simultaneously acquire a proper handhold on them.

PARTICULAR SPECIFICATION PG - ENVIRONMENTAL MANAGEMENT PLAN

CONTENTS

PG 01 SCOPE

This environmental management programme (EMP) sets out the methods by which proper environmental controls are to be implemented by the Contractor. The duration over which the Contractor's controls shall be in place cover the construction period of the project as well as the limited time after contract completion defined by the General Conditions of Contract, and the project specifications, as the defects liability period (maintenance period).

The provisions of this EMP are binding on the Contractor during the life of the contract. They are to be read in conjunction with all the documents that comprise the suite of documents for this contract. In the event that any conflict occurs between the terms of the EMP and the project specifications or Record of Decision, the terms herein shall be subordinate.

The EMP is a dynamic document subject to similar influences and changes as are brought by variations to the provisions of the project specification. Any substantial changes shall be submitted to the Employer in writing for approval.

The EMP identifies the following:

Construction activities that will impact on the environment. Specifications with which the Contractor shall comply in order to protect the environment from the identified impacts. Actions that shall be taken in the event of non-compliance.

This should be read in conjunction with the Environmental Mitigation Plan of the Environmental Consultant specification which shall be applicable should there be a conflicting statement.

PG 02 DEFINITIONS

Alien Vegetation: alien vegetation is defined as undesirable plant growth which shall include, but not be limited to, all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

Construction Activity: a construction activity is any action taken by the Contractor, his subcontractors, suppliers or personnel during the construction process as defined in the South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7, 1998)

Environment: environment means the surroundings within which humans exist and that could be made up of:

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of (i) and (ii) and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Aspect: an environmental aspect is any component of a contractor's construction activity that is likely to interact with the environment.

Environmental Impact: an impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity.

Record of Decision: a record of decision is a written statement from the National Department of Environmental Affairs and Tourism, (NDEAT), that records its approval of a planned undertaking to improve, upgrade or rehabilitate a section of road and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.
Road Reserve: the road reserve is a corridor of land, defined by co-ordinates and proclamation, within which the road, including access intersections or interchanges, is situated. A road reserve may, or may not, be bounded by a fence.

Road Width: for the purposes of the EMP, the road width is defined as the area within the road reserve i.e. fence line to fence line, but also includes all areas beyond the road reserve that are affected by the continuous presence of the road, e.g. a reach of a water course.

PG 03 IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND IMPACTS

The Contractor shall identify likely aspects before commencing with any construction activity. Examples of environment aspects include:

- waste generation
- stormwater discharge
- emission of pollutants into the atmosphere
- chemical use operations
- energy use operations
- water use operations
- use of natural resources
- noise generation

Thereafter the Contractor shall programme his work in such a way that each cause and effect of a construction activity is also identified and the activity planned so as to prevent any impact from happening. If prevention is not practicable, or in the event of mishap or misapplication, the Contractor shall provide plans and measures for the Engineer's approval, which will limit and contain the magnitude, duration and intensity of the impact. The Contractor shall demonstrate that he/she is capable of carrying out any repair and reinstatement of the damaged environment. These requirements shall be concurrent with the time constraints to produce an approved construction programme according to subclause 5.6 of the general conditions of contract and clause B1204 of these project specifications.

Listed below are some environmental impacts that could adversely alter an aspect of the environment through usual construction activities:

- Pollution of atmosphere, soil or water
- Destruction or removal of fauna and flora and effect on biological diversity
- Deformation of the landscapes oil erosion
- Destruction of historical/heritage sites
- Effect on the built environment
- Effect on agricultural land and wetlands

General good construction practice will play an important role in avoiding the occurrence of an Impact. The Contractor's attention is drawn, in this regard, to G 08. Environmental Management of Construction Activities.

PG 04 LEGAL REQUIREMENTS

PG 04.01 General

Construction will be according to the best industry practices, as identified in the project documents. This EMP, which forms an integral part of the contract documents, informs the Contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The Contractor should note that obligations imposed by the EMP are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter shall prevail.

PG 04.02 Statutory and other applicable legislation

The Contractor is deemed to have made himself conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

PG 05 ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS

PG 05.01 Appointment of a Designated Environmental Officer (DEO)

For the purposes of implementing the conditions contained herein, the Contractor shall submit to the Engineer for approval the appointment of a nominated representative of the Contractor as the DEO for the contract. The request shall be given, in writing, at least fourteen days before the start of any work clearly setting out reasons for the nomination, and with sufficient detail to enable the Engineer to make a decision. The Engineer will, within seven days of receiving the request, approve, reject or call for more information on the nomination. Once a nominated representative of the Contractor has been approved he/she shall be the DEO and shall be the responsible person for ensuring that the provisions of the EMP are complied with during the life of the contract. The Engineer will be responsible for issuing instructions to the Contractor where environmental considerations call for action to be taken. The DEO shall submit regular written reports to the Engineer, but not less frequently than once a month.

The Engineer shall have the authority to instruct the Contractor to replace the DEO if, in the Engineer's opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the EMP or this specification. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required.

There shall be an approved DEO on the site at all times.

PG 05.02 Administration

Before the Contractor begins each construction activity the DEO shall give to the Engineer a written statement setting out the following:

- The type of construction activity.
- Locality where the activity will take place.
- Identification of the environmental aspects and impacts that might result from the activity.
- Methodology for impact prevention for each activity or aspect.
- Methodology for impact containment for each activity or aspect.
- Emergency/disaster incident and reaction procedures.
- Treatment and continued maintenance of impacted environment.

- The Contractor may provide such information in advance of any or all construction activities provided that new submissions shall be given to the Engineer whenever there is a change or variation to the original.

The Engineer may provide comment on the methodology and procedures proposed by the DEO, but he shall not be responsible for the Contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the Contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly.

PG 05.03**Good Housekeeping**

The Contractor shall undertake "good housekeeping" practices during construction as stated in SANS 1200. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

PG 06 TRAINING

The designated environmental officer (DEO) must be conversant with all legislation pertaining to the environment applicable to this contract and must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management skills to all personnel involved in the contract.

The Contractor shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. The environmental training should, as a minimum, include the following:

- The importance of conformance with all environmental policies
- The environmental impacts, actual or potential, of their work activities
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Agency's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities.
- In the case of permanent staff the Contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the Contractor shall inform the Engineer when and how he/she intends concluding his environmental training obligations.

PG 07 ACTIVITIES/ASPECTS CAUSING IMPACTS

A list of possible causes of environmental impacts that occur during construction activities is given in Table 1: Aspects or Activities that Cause Environmental Impacts during Construction Activities, which is to be found at the end of this part. This list is not exhaustive, and shall be used for guideline purposes only.

PG 08 ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES

PG 08.01**Site Establishment**

PG 08.01.01 Site Plan

The Contractor shall establish his construction camps, offices, workshops, staff accommodation and testing facilities on the site in a manner that does not adversely affect the environment. However, before construction can begin, the Contractor shall submit to the Engineer for his 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 plans shall detail the locality as well as the layout of the waste treatment facilities for litter, kitchen refuse, sewage and workshop-derived effluents. The site offices should not be sited in close proximity to steep areas, as this will increase soil erosion. Preferred locations would be flat areas along the route. If the route traverses water courses, streams and rivers, it is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles are located as far away as possible from any water course as possible. Regardless of the chosen site, the Contractor's intended mitigation measures shall be indicated on the plan. The site plan shall be submitted not later than the first site meeting. Detailed, electronic colour photographs shall be taken of the proposed site before any clearing may commence. These records are to be kept by the Engineer for consultation during rehabilitation of the site.

PG 08.01.02 Vegetation

The Contractor has a responsibility to inform his staff of the need to be vigilant against any practice that will have a harmful effect on vegetation.

The natural vegetation encountered on the site is to be conserved and left as intact as possible. Vegetation planted at the site shall be indigenous and in accordance with instructions issued by the Engineer. Only trees and shrubs directly affected by the works, and such others as may be indicated by the Engineer in writing, may be felled or cleared. In wooded areas where natural vegetation has been cleared out of necessity, the same species of indigenous trees as were occurring, shall be re-established.

The project specification for the rehabilitation of the grass cover shall be strictly adhered to. Any proclaimed weed or alien species that propagates during the contract period shall be cleared by hand before seeding. 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.

PG 08.01.03 Rehabilitation

The area where the site offices were erected will require rehabilitation at the end of the contract. All construction material, including concrete slabs and braai areas shall be removed from the site on completion of the contract.

PG 08.01.04 Water for human consumption

Water for human consumption shall be available at the site offices and at other convenient locations on site.

All effluent water from the camp/office sites shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water sources (streams, rivers, pans dams etc). Only domestic type wastewater shall be allowed to enter this drain.

PG 08.01.05 Heating and Cooking fuel

The Contractor shall provide adequate facilities for his staff so that they are not encouraged to supplement 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.

PG 08.02 **Sewage treatment (impose penalties on solid waste non-conformance)**

Particular reference in the site establishment plan shall be given to the treatment of sewage generated at the site offices, site laboratory and staff accommodation and at all localities on the site where there will be a concentration of labour. Sanitary arrangements should be to the satisfaction of project management, the local authorities and legal requirements.

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 subcontractor. The type of sewage treatment will depend on the geology of the area selected, 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 800 metres from any natural water course or water retention system. The waste material generated from these facilities shall be serviced on a regular basis. The positioning of the chemical toilets shall be done in consultation with the Engineer. Read with COLTO Specifications 1402(g) and 1404(a).

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on the works. Use of the veld for this purpose 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. The Contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the Engineer.

PG 08.03**Waste Management**

The Contractor's intended methods for waste management and waste minimisation shall be implemented at the outset of the contract. All personnel shall be instructed to dispose of all waste in the proper manner.

PG 08.03.01 Solid Waste

Solid waste shall be stored in an appointed area in covered, tip proof metal drums for collection and disposal. A refuse control system shall be established for the collection and removal of refuse to the satisfaction of the Engineer. Disposal of solid waste shall be at a DWS licensed landfill site or at a site approved by DWS in the event that an existing operating landfill site is not within reasonable distance from the site offices and staff accommodation. No waste shall be burned or buried at or near the site offices, nor anywhere else on the site, including the approved solid waste disposal site.

PG 08.03.02 Litter

No littering by construction workers shall be allowed. During the construction period, the facilities shall be maintained in a neat and tidy condition and the site shall be kept free of litter.

Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. At all places of work the Contractor shall provide litter collection facilities for later safe disposal at approved sites.

PG 08.03.03 Hazardous waste

Hazardous waste such as bitumen, tar, oils etc. shall be disposed of in a DWS approved landfill site. Special care shall be taken to avoid spillage of tar or bitumen products such as binders or pre-coating fluid to avoid water-soluble phenols from entering the ground or contaminating water.

Under no circumstances shall the spoiling of tar or bituminous products on the site, over embankments, in borrow pits or any burying, be allowed. Unused or rejected tar or bituminous products shall be returned to the supplier's production plant. Any spillage of tar or bituminous products shall be attended to immediately and affected areas shall be promptly reinstated to the satisfaction of the Engineer.

PG 08.04 **Control at the workshop**

The Contractor's management and maintenance of his plant and machinery will be strictly monitored according to the criteria given below, regardless whether it is serviced on the site (i.e. at the place of construction activity or at a formalised workshop)

PG 08.04.01 Safety

All the necessary handling and safety equipment required for the safe use of petrochemicals and oils shall be provided by the Contractor to, and used or worn by, the staff whose duty it is to manage and maintain the Contractor's and his subcontractor's and supplier's plant, machinery and equipment.

PG 08.04.02 Hazardous Material Storage

Petrochemicals, oils and identified hazardous substances shall only be stored under controlled conditions. All hazardous materials e.g. tar or bitumen binders shall be stored in a secured, appointed area that is fenced and has restricted entry. Storage of tar or bituminous products shall only take place using suitable containers to the approval of the Engineer.

The Contractor shall provide proof to the Engineer that relevant authorisation to store such substances has been obtained from the relevant authority. In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure. Before containment or storage facilities can be erected the Contractor shall furnish the Engineer with details of the preventative measures he proposes to install in order to mitigate against pollution of the surrounding environment from leaks or spillage. The preferred method shall be a concrete floor that is bunded. Any deviation from the method will require proof from the relevant authority that the alternative method proposed is acceptable to that authority. The proposals shall also indicate the emergency procedures in the event of misuse or spillage that will negatively affect an individual or the environment.

PG 08.04.03 Fuel and Gas Storage

Fuel shall be stored in a secure area in a steel tank supplied and maintained by the fuel suppliers. An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas

to accommodate any leakage spillage or overflow of these substances. The area inside the bund wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. Any leakage, spillage or overflow of fuel shall be attended to without delay.

Gas welding cylinders and LPG cylinders shall be stored in a secure, well-ventilated area.

PG 08.04.04 Oil and Lubricant Waste

Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and sent back to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, shall be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials. Oil collected by a mobile servicing unit shall be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company.

All used filter materials shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced. Soils contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials.

PG 08.05 **Clearing the Site**

In all areas where the Contractor intends to, or is required to clear the natural vegetation and soil, either within the road reserve, or at designated or instructed areas outside the road reserve, a plan of action shall first be submitted to the Engineer for his approval.

The plan shall contain a photographic record and chainage/land reference of the areas to be disturbed. This shall be submitted to the Engineer for his records before any disturbance/stockpiling may occur. The record shall be comprehensive and clear, allowing for easy identification during subsequent inspections.

The Contractor shall be responsible for the re-establishment of grass within the road reserve boundaries for all areas disturbed during road construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for, or from, road construction has to be stored temporarily or otherwise within the road reserve, or at designated or instructed areas outside the road reserve. This responsibility shall extend until expiry of the defects liability period.

PG 08.06 **Soil Management**

PG 08.06.01 Topsoil

Topsoil shall be removed from all areas where physical disturbance of the surface will occur and shall be stored and adequately protected. The contract will provide for the stripping and stockpiling of topsoil from the site for later re-use. Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. Depth may vary at each site. The areas to be cleared of topsoil shall include the storage areas. All topsoil stockpiles and windrows shall be maintained throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand. Soils contaminated by hazardous substances shall be disposed of at an approved Department of Water and Sanitation waste disposal site. The topsoil stockpiles shall be stored, shaped and sited in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water. Stockpiles of topsoil shall not exceed a height of 2m, and if they are to be

left for longer than 6 months, shall be analysed, and if necessary, upgraded before replacement. Stockpiles shall be protected against infestation by weeds.

The Contractor shall ensure that no topsoil is lost due to erosion – either by wind or water. Areas to be topsoiled and grassed shall be done so systematically to allow for quick cover and reduction in the chance of heavy topsoil losses due to unusual weather patterns. The Contractor's programme shall clearly show the proposed rate of progress of the application of topsoil and grassing. The Contractor shall be held responsible for the replacement, at his own cost, for any unnecessary loss of topsoil due to his failure to work according to the progress plan approved by the Engineer. The Contractor's responsibility shall also extend to the clearing of drainage or water systems within and beyond the boundaries of the road reserve that may have been affected by such negligence.

PG 08.06.02 Subsoil

The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed, to a depth instructed by the Engineer, and stored separately from the topsoil if not used for road building. This soil shall be replaced in the excavation in the original order it was removed for rehabilitation purposes.

PG 08.07 **Drainage**

The quality, quantity and flow direction of any surface water runoff shall be established prior to disturbing any area for construction purposes. Cognisance shall be taken of these aspects and incorporated into the planning of all construction activities. Before a site is developed or expanded, it shall be established how this development or expansion will affect the drainage pattern. Recognised water users / receivers shall not be adversely affected by the expansion or re-development. No water source shall be polluted in any way due to proposed changes.

Streams, rivers, pans, wetlands, dams, and their catchments shall be protected from erosion and from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous or tar products.

The Contractor shall submit to the Engineer his proposals for prevention, containment and rehabilitation measures against environmental damage of the identified water and drainage systems that occur on the site. Consideration shall be given to the placement of sedimentation ponds or barriers where the soils are of a dispersive nature or where toxic fluids are used in the construction process. The sedimentation ponds must be large enough to contain runoff so that they function properly under heavy rain conditions.

PG 08.08 **Earthworks and Layerworks**

This section includes all construction activities that involve the mining of all materials, and their subsequent placement, stockpile, spoil, treatment or batching, for use in the permanent works, or temporary works in the case of deviations. Before any stripping prior to the commencement of construction, the Contractor shall have complied with the requirements of sections G 08.05 and G 08.07. In addition, the Contractor shall take cognisance of the requirements set out below.

PG 08.08.01 Quarries and borrow pits

The Contractor's attention is drawn to the requirement of the Department of Minerals and Energy, that before entry into any quarry or borrow pit, an EMP for the establishment, operation and closure of the quarry or borrow pit shall have been approved by the Department. It is the responsibility of the Contractor to ensure that he is in possession of the approved EMP or a

copy thereof, prior to entry into the quarry or borrow pit. The conditions imposed by the relevant EMP are legally binding on the Contractor and may be more extensive and explicit than the requirements of this specification. In the event of any conflict occurring between the requirements of the specific EMP and these specifications the former shall apply. The cost of complying with the requirements shall be deemed to be included in existing rates in the Bill of Quantities.

PG 08.08.02 Excavation, hauling and placement

The Contractor shall provide the Engineer with detailed plans of his intended construction processes prior to starting any cut or fill or layer. The plans shall detail the number of personnel and plant to be used and the measures by which the impacts of pollution (noise, dust, litter, fuel, oil, sewage), erosion, vegetation destruction and deformation of landscape will be prevented, contained and rehabilitated. Particular attention shall also be given to the impact that such activities will have on the adjacent built environment. The Contractor shall demonstrate his "good housekeeping", particularly with respect to closure at the end of every day so that the site is left in a safe condition from rainfall overnight or over periods when there is no construction activity.

PG 08.08.03 Spoil sites

The Contractor shall be responsible for the safe siting, operation, maintenance and closure of any spoil site he uses during the contract period, including the defects liability period. This shall include existing spoil sites that are being re-entered. Before spoil sites may be used proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the Engineer for his approval. The location of these spoil sites shall have signed approval from the affected landowner before submission to the Engineer. No spoil site shall be located within 500m of any watercourse. A photographic record shall be kept of all spoil sites for monitoring purposes. This includes before the site is used and after re-vegetation.

The use of approved spoil sites for the disposal of hazardous or toxic wastes shall be prohibited unless special measures are taken to prevent leaching of the toxins into the surrounding environment. Such special measures shall require the approval of the relevant provincial or national authority. The same shall apply for the disposal of solid waste generated from the various camp establishments. The Engineer will assist the Contractor in obtaining the necessary approval if requested by the Contractor.

Spoil sites will be shaped to fit the natural topography. These sites shall receive a minimum of 75mm topsoil and be grassed with the recommended seed mixture. Slopes shall not exceed a vertical: horizontal ratio of 1:3. Only under exceptional circumstances will approval be given to exceed this ratio. Appropriate grassing measures to minimise soil erosion shall be undertaken by the Contractor. This will include both strip and full sodding. The Contractor may motivate to the Engineer for other acceptable stabilising methods. The Engineer may only approve a completed spoil site at the end of the defects liability period upon receipt from the Contractor of a landowner's clearance notice and an engineer's certificate certifying slope stability The Contractor's costs incurred in obtaining the necessary certification for opening and closing of spoil sites shall be deemed to be included in the tendered rates for spoiling.

PG 08.08.04 Stockpiles

The Contractor shall plan his activities so that materials excavated from borrow pits and cuttings, in so far as possible, can be transported direct to and placed at the point where it is to be used. However, should temporary stockpiling become necessary, the areas for the stockpiling of excavated and imported material shall be indicated and demarcated on the site

plan submitted in writing to the Engineer for his approval, together with the Contractor's proposed measures for prevention, containment and rehabilitation against environmental damage.

The areas chosen shall have no naturally occurring indigenous trees and shrubs present that may be damaged during operations. Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of the stockpiles the Contractor shall at all times ensure that they are:

- Positioned and sloped to create the least visual impact;
- Constructed and maintained so as to avoid erosion of the material and contamination of surrounding environment; and
- Kept free from all alien/undesirable vegetation.

After the stockpiled material has been removed, the site shall be re-instated to its original condition. No foreign material generated / deposited during construction shall remain on site. Areas affected by stockpiling shall be landscaped, top soiled, grassed and maintained at the Contractor's cost until clearance from the Engineer and the relevant Authority is received.

Material milled from the existing road surface that is temporarily stockpiled in areas approved by the Engineer within the road reserve, shall be subject to the same condition as other stockpiled materials. Excess materials from windrows, in-situ milling or any detritus of material from road construction activities may not be swept off the road and left unless specifically instructed to do so in the contract drawing or under instruction from the Engineer
In all cases, the Engineer shall approve the areas for stockpiling and disposal of construction rubble before any operation commences and shall approve their clause only when they have been satisfactorily rehabilitated.

PG 08.08.05 Blasting activities

Wherever blasting activity is required on the site (including quarries and/or borrow pits) the Contractor shall rigorously adhere to the relevant statutes and regulations that control the use of explosives. In addition, the Contractor shall, prior to any drilling of holes in preparation for blasting, supply the Engineer with a locality plan of the blast site on which shall be shown the zones of influence of the ground and air shock-waves and expected limits of fly-rock. The plan shall show each dwelling, structure and service within the zones of influence and record all details of the dwellings/structures/services including existing positions, lengths and widths of cracks, as well as the condition of doors, windows, roofing, wells, boreholes etc. The Contractor, alone, shall be responsible for any costs that can be attributed to blasting activities, including the collection of fly-rock from adjacent lands and fields. The submission of such a plan shall not in any way absolve the Contractor from his responsibilities in this regard. The Contractor shall also indicate to the Engineer the manner in which he intends to advertise to the adjacent communities and/or road users the times and delays to be expected for each individual blast.

PG 08.09 **Batching sites**

Asphalt plants are considered scheduled processes listed in the second schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965). Should the use of an asphalt plant be considered on site, the Contractor shall be responsible to obtain the necessary permit from the Department of Environmental Affairs and Tourism, regardless of where they are sited.

Crushing plants and concrete batching plants, whether sited inside or outside of defined quarry or borrow pit areas, shall be subject to the requirements of the Department of Minerals and Energy legislation as well as the applicable industrial legislation that governs gas and dust emissions into the

atmosphere. Such sites will be the subject of regular inspections by the relative authorities during the life of the project. In addition, the selection, entry onto, operation, maintenance, closure and rehabilitation of such sites shall be the same as for those under section G 08.08.03, with the exception that the Contractor shall provide additional measures to prevent, contain and rehabilitate against environmental damage from toxic/hazardous substances. In this regard the Contractor shall provide plans that take into account such additional measures as concrete floors, bunded storage facilities, linings to drainage channels and settlement dams. Ultimate approval of these measures shall be from the relevant national authority, as shall approval of closure. The Engineer will assist the Contractor in his submissions to the relevant authority.

Effluent from concrete batch plants and crusher plants shall be treated in a suitable designated sedimentation dam to the legally required standards to prevent surface and groundwater pollution. The designs of such a facility should be submitted to the Engineer for approval.

The Contractor shall invite the relevant department to inspect the site within 2 months after any plant is commissioned and at regular intervals thereafter, not exceeding 12 months apart

PG 08.10 **Spillages**

Streams, rivers and dams shall be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and tar or bituminous products. In the event of a spillage, the Contractor shall be liable to arrange for professional service providers to clear the affected area.

Responsibility for spill treatment lies with the Contractor. The individual responsible for, or who discovers a hazardous waste spill must report the incident to his/her DEO or to the Engineer. The Designated Environmental Officer will assess the situation in consultation with the Engineer and act as required. In all cases, the immediate response shall be to contain the spill. The exact treatment of polluted soil / water shall be determined by the Contractor in consultation with the DEO and the Engineer. Areas cleared of hazardous waste shall be re-vegetated according to the Engineer's instructions

Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed. The requirement for such input shall be agreed with the Engineer. The costs of containment and rehabilitation shall be for the Contractor's account, including the costs of specialist input.

PG 08.11 **Areas of Specific Importance**

Any area, as determined and identified within the project document as sensitive or of special interest within the site shall be treated according to the express instructions contained in these specifications or the approved EMP. The Contractor may offer alternative solutions to the Engineer in writing should he consider that construction will be affected in any way by the hindrance of the designated sensitive area or feature. However, the overriding principle is that such defined areas requiring protection shall not be changed. Every effort to identify such areas within the site will have been made prior to the project going out to tender. The discovery of other sites with archaeological or historical interest that have not been identified shall require ad hoc treatment.

PG 08.11.01 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 thereof inform the Engineer of

such discovery. The National Monuments Council is to be contacted who will appoint an archaeological consultant. Work may only resume once clearance is given in writing by the archaeologist. (Read with Subclause 4.7.1 of the General Conditions of Contract).

PG 08.11.02 Graves and middens

If a grave or midden is uncovered on site, or discovered before the commencement of work, then 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. (Read with Subclause 4.7.1 of the General Conditions of Contract).

PG 08.12 **Noise Control**

The Contractor shall endeavour to keep noise generating activities to a minimum. Noises that could cause a major disturbance, for instance blasting and crushing activities, should only be carried out during daylight hours. Compliance with the appropriate legislation with respect to noise, shall be mandatory.

Should noise generating activities have to occur at night the people in the vicinity of the drilling shall be warned about the noise well in advance and the activities kept to a minimum.

PG 08.13 **Dust Control**

Dust caused by strong winds shall be controlled by means of water spray vehicles. Dust omission from batching plants shall be subject to the relevant legislation and shall be the subject of inspection by the relevant office of the Department of Minerals and Energy.

PG 08.14 **Alien Vegetation**

The Contractor shall be held responsible for the removal of alien vegetation within the road reserve disturbed during road construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for or from road construction has been stored temporarily or otherwise within the road reserve. This responsibility shall extend for the duration of the defects liability period.

PG 09 RECORD KEEPING

The Engineer and the DEO will continuously monitor the Contractor's adherence to the approved impact prevention procedures and the Engineer shall issue to the Contractor a notice of non-compliance whenever transgressions are observed. The DEO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the Engineer in the monthly report.

Copies of any record of decision or EMP's for specific borrow pits or quarries used on the project shall be kept on site and made available for inspection by visiting officials from the Employer or relevant environmental departments.

PG 10 COMPLIANCE AND PENALTIES

The Contractor shall act immediately when such notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. This record shall be submitted with the monthly reports and a verbal report given at the monthly site meetings.

Any avoidable non-compliance with the above-mentioned measures shall be considered sufficient ground for the imposition of a penalty

The following penalties shall apply for environmental violations:

***PG* 10.01 Unnecessary removal or damage to trees:**

- 2600mm girth or less: R5 000 per tree
- Greater than 2600mm, but less than 6180mm girth: R10 000 per tree
- Greater than 6180mm girth: R30 000 per tree

***PG* 10.02 Serious violations:**

- Hazardous chemical/oil spill and/or dumping innon-approved sites: R10 000 per incident
- General damage to sensitive environments: R5 000 per incident
- Damage to cultural and historical sites: R5 000 per incident
- Uncontrolled/unmanaged erosion (plus rehabilitation at the Contractor's cost): R1 000 to R5 000 per incident
- Unauthorised blasting activities: R5 000 per incident
- Pollution of water sources: R10 000 per incident

The Engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final.

***PG* 10.03 Less serious violations:**

- Littering on site: R1 000 per incident
- Lighting of illegal fires on site: R1 000 per incident
- Persistent or un-repaired fuel and oil leaks: R1 000 per incident
- Excess dust or excess noise emanating from site: R1 000 per incident
- Dumping of milled material in side drains or on grassed areas: R1 000 per incident
- Possession or use of intoxicating substances on site: R500 per incident
- Any vehicles being driven in excess of designated speed limits: R500 per incident
- Removal and/or damage to flora or cultural or heritage objects on site, and/or killing of wildlife: R2 000 per incident
- Illegal hunting: R2 000 per incident
- Urination and defecation anywhere except in designated areas: R500 per incident

The Engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final. The imposition of such a penalty shall not preclude the relevant provincial or national authority from applying an additional penalty in accordance with its statutory powers. Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as it deems fit.

PG 11 MEASUREMENT AND PAYMENT

Item **Unit**

***PG* 11.01 Penalty for unnecessary removal or damage to trees for the following diameter sizes:**

(a) 2600mm girth or less ..... number (No)
(b) Greater than 2600mm, but less than 6180mm girth ..... number (No)
(c) Greater than 6180mm girth ..... number (No)

The unit of measurement shall be the number of trees by diameter size removed unnecessary or damaged. The penalty rates applied shall be those stated in clause G 10.01.

Item **Unit**

***PG* 11.02 Penalty for serious violations:**

(a) Hazardous chemical/oil spill and/or dumping in non-approved sites ..... number (No)
(b) General damage to sensitive environments ..... number (No)
(c) Damage to cultural and historical sites ..... number (No)
(d) Pollution of water sources ..... number (No)
(e) Unauthorised blasting activities ..... number (No)
(f) Uncontrolled/unmanaged erosionper incident, depending on environment impacts, plus rehabilitation at the Contractor's cost) ..... number (No)

The unit of measurement for G 11.02(a) to (f) shall be the number of serious violation incidents. The penalty rates to be applied shall be those stated in clause G 10.02.

Item **Unit**

***PG* 11.03 Penalty for less serious violations:**

(a) Littering on site ..... number (No)
(b) Lighting of illegal fires on site ..... number (No)
(c) Persistent or un-repaired fuel and oil leaks ..... number (No)
(d) Excess dust or excess noise emanating from site ..... number (No)
(e) Dumping of milled material in side drains or on grassed areas ..... number (No)
(f) Possession or use of intoxicating substances on site ..... number (No)
(g) Any vehicles being driven in excess of designated speed limits ..... number (No)
(h) Removal and/or damage to flora or cultural or heritage objects on site, and/or killing of wildlife ..... number (No)
(i) Illegal hunting ..... number (No)
(j) Urination and defecation anywhere except in designated areas ..... number (No)

The unit of measurement shall be the number of less serious violation incidents. The penalty rates applied shall be those stated in clause G 10.03.

The Engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final. The imposition of such a penalty shall not preclude the relevant provincial or national authority from applying an additional penalty in accordance with its statutory powers. Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as it deems fit.

Item **Unit**

***PG* 11.04 Contractor's time related obligations in respect of Environmental management plans and specifications** .....month

The tendered monthly amount shall represent full compensation for that part of the Contractor's general obligations in terms of the environmental management plans and specifications which are mainly a function of time. This includes inter alia payment of all costs of the approved designated environmental office (DEO) and other staff contemplated in the administration of the environmental obligations, including the transport of employees on site. Payment will be monthly.

PARTICULAR SPECIFICATION PHDD – HORIZONTAL DIRECTIONAL DRILLING

CONTENTS

PHDD 1 Jacking Establishment

(a) Fixed charges
(b) Time-related charges (period to be stated by contractor)

The sums for (a) and (b) above shall cover respectively the fixed and time-related charges, as applicable for providing establishment on site and the subsequent removal of all special equipment and plant for horizontal directional drilling or boring, including the thrust block when applicable, for maintaining the safety of existing structures, services, roads, railways, etc. for bracing, lighting, watching, dewatering and surveying, and for maintaining all temporary works until the work is completed.

PHDD 2 Excavation for Horizontal Directional Drilling (in all material)

Excavation for Horizontal Directional Drilling will be measured in the in-situ condition calculated from the length of pipe jacked and the external diameter of the jacked pipe. Additional volumes excavated for the thrust and the reception pits will not be measured for payment under this item.

The rate shall cover the cost of digging at the face through all materials foreseen in the project specification or as scheduled, transporting excavated material through the pipe, lifting to ground level, loading and dumping the material within 0.5km from the thrust pit (distance to be measured radially), ventilation, de-watering, and light within the pipe.

PHDD 3 Install and Supply of pipes to be Horizontal Directional Drilling in

The unit of measurement shall be the meter of completed Horizontal Directional Drilling pipeline measured between the ends of the completed pipeline continuously through intermediate stations.

The tendered rate shall include full compensation for the supply, delivery and storing the pipes, for rubber rings, packing pieces, and the flexible sealing of joints between intermediate pipes.

PHDD 4 Install and Supply of pipes to be Horizontal Directional Drilling in Hard Rock

The unit of measurement shall be the meter of completed Horizontal Directional Drilling pipeline measured between the ends of the completed pipeline continuously through intermediate stations.

The tendered rate shall include full compensation for the supply, delivery and storing the pipes, for rubber rings, packing pieces, and the flexible sealing of joints between intermediate pipes.

C3.5 Management

C3.5.1 Management of The Works

C3.5.1.1 Applicable SANS and SANS Standards

The provisions of these Specifications take precedence over the provisions of any part of SANS 2001 that is applicable to the contract. The variations and additions to these specifications are described in the section "Applicable SANS 1200 Standardized Specifications".

The SANS 1200 Standardized Specifications listed in C3.4.1.1 are applicable.

C3.5.1.2 Particular/Generic Specifications

The Particular Specifications listed in C3.4.6 apply to this Contract.

C3.5.1.3 Methods and Procedures

(a) Maintenance of access and streets

The operation of construction vehicles on existing roads or streets, or streets that have been completed to the level of subbase, base or surfaced treatment, shall be limited to the traffic with an axle load not exceeding that allowed by the Road Traffic Ordinance of the authority concerned, or any amendment thereof. Hauling is strictly fortenderden on sections of road or streets that have been completed as described above. The Contractor shall make use of a temporary haul road, or where not practically possible, program his work in such a manner that the haulage materials shall be restricted to that required for the particular section of street. No additional payment shall be made for the use of temporary haul roads and all relevant costs shall be deemed covered by the appropriate rates.

No additional payment will be made for the construction of temporary access roads to the construction site, borrow areas or the spoil sites, except for payment made under payment item A8.3.2.2 of SANS 1200 A.

Should the Contractor make use of existing roads or streets for haulage, he shall be held responsible to clear the road or street of any spillage caused by his activities within one (1) day after such spillage occurred. No additional payment will be made for the cleaning of the spillage.

(b) Blasting operation

All blasting shall be carried out by a competent, registered blaster. The blaster shall furnish to the Engineer copies of all the permits required to purchase, transport, use and dispose of unused blasting material. The Contractor shall inform the commander of the local SAPS at least 1 day prior to the date and time blasting is about to take place.

No blasting operations shall take place on weekends or holidays or week days after 17h00.

The Contractor shall ensure that sufficient suitable material, to the satisfaction of the blaster, is available and in place before the blast is initiated. The Contractor shall be responsible to note in writing (photographs) the structural status of structures before blasting for comparison after blasting.

(c) Normal working hours

Normal working hours shall be from 07h00 until 17h00 on weekdays from Monday to Friday. It shall be from 07h00 until 13h00 on Saturdays.

Work on other days will only be allowed after written approval has been granted by the Engineer.

(d) Interference with municipal staff and operations

The Contractor shall ensure that none of his staff interfere in any way with any municipal staff member or their functions or with the operations of the water treatment works in any way.

Any person ignoring this shall be removed permanently from site, all at the expense of the Contractor.

(e) Access for other contractors

The Contractor shall provide reasonable access to other Contractors carrying out work on the site from time to time, as and when such access is required. The Contractor is entitled to request reasonable notification of at least 24 hours before access by others is required.

The contractual responsibilities of the Contractor shall remain in full force in spite of the other Contractors having access to the site.

(f) Giving notice of work to be covered up

The Contractor shall give the Engineer at least 24 hours notice prior to a request for examination of materials or work to be covered up. This request must be made in the request book on site.

Should such a request be made and upon inspection the Engineer found that the works or materials are not yet ready for inspection, the Contractor shall reimburse the Engineer within 30 days of invoice for all expenses incurred as a result.

(g) Sequence of the works

The Contractor shall arrange with the mechanical and electrical Contractor and the Engineer the sequence of the works to ensure the existing plant remains in operation.

C3.5.1.4 Quality plans and control (Testing)

Refer to Section C3.4.2.5(b).

C3.5.1.5 Environmental Management Plan (EMP)

(a) Demarcation of the site

For the purpose of the EMP, the site shall be demarcated into two distinct areas, viz.;

(i) The construction camp comprising all buildings, hostels, offices, lay down yards, vehicle wash areas, fuel and material storage area, batching areas and other infrastructure that is required for the running of the job.

(ii) The working area in which construction activities are permitted to take place. No infrastructure, permanent lay down or storage areas shall be established in this working are unless specified in the project specification or prior approval is obtained from the Engineer.

(b) Construction camp

The Contractor shall provide the Engineer with a plan showing the positions of all buildings, yards, vehicle wash areas, batching areas and other infrastructure for approval by the Engineer at least ten (10) days prior to the commencement date.

(c) Fencing of site

If a temporary fence is required, the Contractor shall erect and maintain such a fence (demarcating the boundary of the working area, construction camp and access roads) to the satisfaction of the Engineer.

This fence shall be erected before the commencement of any other work on site. The fence shall be removed after completion of the project and the site reinstated to its original state.

(d) Workshops

All workshops shall be located inside the demarcated construction camp area as approved by the Engineer prior to establishment. The workshop shall have a smooth impermeable concrete floor sloped to one side where oil is trapped in an oil trap or sump to contain any spillages of substances such as oil.

Waste material shall be disposed of in accordance with the national, regional and local by-laws regulations and by-laws. The waste shall be regularly removed and disposed of at an approved site.

(e) Eating areas

The Contractor's employees shall eat in a designated eating area indicated on the drawing approved by the Engineer. The Contractor shall provide adequate shade and provide scavenger proof and waterproof refuse bins. Cooking will only take place in this area on well maintained gas cookers with fire extinguishers present. Open fires other than the gas cookers shall not be allowed.

(f) Watchmen

The Contractor shall have a watchman present on site during non-working hours and on holidays to ensure the safety of plant and materials on site.

(g) Ablution facilities

The exact location of toilets shall be approved by the Engineer. The Contractor shall provide the toilets and maintain and service it on a daily basis. The toilets shall be kept clean. Regular inspections shall be conducted by the Engineer. Burial of waste on site is strictly fortenderden. Leaking or broken toilets shall be removed and replaced immediately by the Contractor.

(h) Solid waste

"Solid waste" refers to construction debris, chemical waste, tins, cans, paper, wrappers, excess concrete, waste timber, etc.

The Contractor shall establish a waste control and removal system. He shall submit a method statement to the Engineer for approval prior to commencement.

Appropriate solid waste containers shall be provided for the storage of waste. The containers shall be water proof. The waste shall be removed on a regular basis to prevent the accumulation of waste on site and disposed of at an approved waste site.

(i) Wastewater

Water shall be used sparingly on site. Where possible, wastewater shall be recycled. A wastewater management plan shall be submitted to the Engineer for approval 10 days prior to the commencement date.

The management plan shall detail the expected extent of the contamination of each wastewater stream and how the Contractor plans to deal with it.

Wastewater shall be prevented from flowing into the Olifants River.

(j) Fuel storage area

Fuel shall be stored on site in a depot at a location as agreed with the Engineer. The Contractor shall ensure that liquid fuels are stored in tanks with lids. The tanks shall be placed on a sloped smooth concrete surface with an oil trap on the lower end to collect any spillage.

Fuel shall be kept under lock at all times.

(k) Concrete batching area

Cement and concrete is hazardous to the environment due to the high pH of the material and the chemicals it contains.

The Contractor shall furnish to the Engineer for approval a method statement for the mixing of concrete. Concrete shall not be mixed directly on the ground. Care must be taken to ensure that wastewater and contaminated material is collected and disposed of correctly.

(l) Equipment maintenance and storage

All equipment and vehicles shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or removed from site. Where possible, maintenance and service shall take place only in the workshop. Permission must be obtained from the Engineer if the aforementioned cannot be adhered to.

The Contractor shall demarcate an area in which the equipment and vehicles may be stored. The location shall be approved by the Engineer.

(m) Materials handling, use and storage

The Contractor is responsible to ensure that all material suppliers are aware of the EMP's restrictions and conditions. The Contractor shall be held responsible should deliveries not comply with the EMP requirements.

The Contractor shall comply with all relevant national, regional and local legislation with regard to the transport, use and disposal of hazardous material.

The Contractor shall furnish to the Engineer a list of all hazardous materials to be used on site, together with the handling, storage and disposal procedures of the materials. This information shall be available to all personnel on site.

The location of the hazardous material store shall be within the demarcated construction camp area. The location shall be approved by the Engineer.

Where possible, the Contractor shall ensure that the refuelling of vehicles takes place only at the fuel storage area in the construction camp. If this is not possible, the Contractor shall obtain permission from the Engineer to refuel at any other place. Contaminated material and wastewater at the refuelling area shall be contained and disposed of correctly.

(n) Emergency procedures

The Contractor shall ensure that emergency procedures for the following situations are submitted for approval to the Engineer;

Fire – the Contractor shall inform the relevant authority immediately as soon as a fire starts. The Contractor shall ensure that his staff and subcontractors are fully aware of the procedures to be followed in the event of a fire.

Spillages – the Contractor shall ensure that his staff and subcontractors are fully aware of the procedures to be followed in the event of a spillage. The Engineer must be informed immediately about a spill. The Contractor shall ensure that the necessary materials and equipment is on site to deal with spills and leaks. The cleanup of spills and leaks shall be for the account of the Contractor.

(o) Care of surrounding areas

The Contractor shall ensure that no contamination of or damage to the surrounding areas or watercourses shall occur as a result of any of his activities during construction.

C3.5.1.6 Planning and programming

Early completion of the extensions to the water treatment works is important.

The existing water treatment works must remain fully operational.

Immediately after handing over the site, the Engineer and the Contractor will discuss the order of procedure and methods in which the Contractor shall carry out the works. The order of the work shall be such that the mechanical and electrical Contractor is not unnecessarily delayed by the Contractor.

Before handing over a structure to the mechanical and electrical Contractor for the installation of mechanical and or electrical equipment, the Contractor shall ensure the absence of scaffolding, formwork, building materials, rubble or open trenches.

The programme to be furnished by the Contractor to the Engineer for approval shall be in the form of a Gantt chart. The critical path shall be indicated in red.

C3.5.1.7 Other Contractors on site

A mechanical and electrical Contractor will be on site during the latter part of the contract period to install mechanical and electrical equipment. Close cooperation is required between the Contractor and this mechanical and electrical Contractor to ensure neither delays the other.

C3.5.1.8 Recording of weather

The Contractor shall record the weather conditions on a daily basis in the site diary. Rainfall figures and strong wind which could delay the Works shall be noted, recorded and confirmed by the signature of the Engineer's Representative on site.

C3.5.1.9 Format of communications

All communication regarding the Contract shall be channelled through the Engineer or his representative. Formal contractual communication shall be in writing.

Instructions will only be given by the Engineer or his representative. The Contractor shall not take any instructions from the Employer, the local municipality or the superintendent or operators.

C3.5.1.10 Progress meetings, planning and programming

A project progress meeting shall be held monthly on site for the duration of the project on dates to be agreed upon. The Contractor shall be responsible for the venue for the meeting. He will also ensure that the CLO attend all such meetings.

The Contractor shall furnish to the Engineer a Gantt chart programme with the critical path indicated in red. This shall be done on MS Project and shall be furnished in hard copy and electronically to the Engineer.

C3.5.1.11 Site Diary

Daily records of plant, personnel, materials, etc., shall be recorded daily by the Contractor and noted in the site diary which will be supplied by the Contractor before the commencement date of the project.

All visitors shall be required by the CLO to complete the site diary.

C3.5.1.12 Site Instructions

Only the Engineer or his representative has the mandate to issue site instructions to the Contractor. This will be done in writing in the site instruction book or per facsimile, or per letter or per minutes of the site meeting.

The Contractor shall furnish an A4 site instruction book in triplicate before the commencement date of the Contract.

C3.6 Health and Safety

C3.6.1 Health and Safety Requirements and Procedures

Before commencement of work, the Contractor shall present to the Engineer his Health and Safety Plan for approval. He shall also appoint a qualified health and Safety Officer in writing and give a copy of the letter of appointment to the Engineer.

The Health and Safety Specification is attached as Appendix C and must be referred to when compiling the Health and Safety Plan.

(a) Construction Regulations, 2014

The Contractor shall be required to comply with the Occupational Health and Safety Act, 1993: Construction Regulations, as promulgated in Government Gazette No.47970 of 31 January 2023 Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

The proposed type of work, materials to be used and potential hazards likely to be encountered on this Contract are detailed in the Project Specifications, Schedule of Quantity and Drawings, as well as in the Employers' Health and Safety Specifications (regulation 4(1)) of the Construction Regulations 2014.

The Contractor shall in terms of regulation 5(1) provide a comprehensive health and safety plan detailing his proposed compliance with the regulations, for approval by the Employer.

The Contractor shall at all times be responsible for full compliance with the approved plan as well as the Construction Regulations and no extension of time will be considered for delays due to non-compliance with the abovementioned plan or regulations.

Payment items are included in the Schedule of Quantities to cover the Contractor's cost for compliance with the OHS Act and the abovementioned regulations.

C3.6.2 PROTECTION OF THE PUBLIC

The site is not accessible to the general public. However, the existing water treatment works must remain in operation for the duration of the Contract. The Contractor shall ensure that all personnel entering the construction site is fully informed about the dangers, do's and don'ts on the site. The Contractor shall ensure that non-construction personnel are protected within the guidelines of the OHS Regulations.

C3.6.3 BARRICADES AND LIGHTING

All excavations and openings in walls and slabs into which or through which a person may fall, shall be securely barricaded in accordance with the requirements of the applicable OHS Regulations.

C3.6.4 VEHICULAR AND PEOPLE TRAFFIC CONTROL

The Safety Officer shall take full responsibility for the vehicular and people traffic control in and around the site. The personnel of the existing water treatment works shall be fully informed and trained by the Safety Officer if required.

C3.6.5 MEASURES AGAINST DISEASE AND EPIDEMICS

No particular measures have to be taken against disease and epidemics on site.

Untreated water from may not be used for human consumption on the Site.

C3.6.6 AIDS AWARENESS

All construction personnel shall be given an Aids awareness briefing by the Safety Officer.

OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

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LIST OF ABBREVIATIONS

OHS: Occupational Health and Safety

CEO: Chief Executive Officer

CR: Construction Regulations

COVID-19 Coronavirus Disease 2019

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

PPE Personal Protective Equipment;

HCS: Hazardous Chemical Substances

MSDS: Material Safety Data Sheet

AIA: Approved Inspection Authority

HBA: Hazardous Biological Agents

OEL: Occupational Exposure Limit

SDM: Sekhukhune District Municipality

H&SS: Health and Safety Specification

HS&EP: Health, Safety and Environmental Plan

HS&EF: Health, Safety and Environmental File

CHSO: Construction Health and Safety Officer

DEFINITIONS

The following definitions from the Occupational Health and Safety Act are listed as follows:

"The Act" means the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);

Agent –means a competent person who acts as a representative for a client;

Client–means any person for whom construction work is performed;

Construction manager means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;

Chief Executive Officer-In relation to a body corporate or an enterprise conducted by the State, means the person who is responsible for the overall management and control of the business of such body corporate or enterprise.

Construction site-means a work place where construction work is being performed;

Construction supervisor-means a competent person responsible for supervising construction activities on a construction site;

Construction work- means any work in connection with -

(a) the construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; or

(b) the construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving of earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work;

Contractor –means an employer who performs construction work;

Designer-means-

(a) a competent person who-

(i) prepares a design;

(ii) checks and approves a design;

(iii) arranges for a person at work under his or her control to prepare a design, including an employee of that person where he or she is the employer; or

(iv) designs temporary work, including its components;

(b) an architect or engineer contributing to, or having overall responsibility for a design;

(c) a building services engineer designing details for fixed plant;

(d) a surveyor specifying articles or drawing up specifications;

(e) a contractor carrying out design work as part of a design and building project; or an interior designer, shop-fitter or landscape architect;

Danger-Means anything that may cause injury or damage to persons or property.

Excavation work- means the making of any man-made cavity, trench, pit or depression formed by cutting, digging or scooping;

Employee-Means, subject to the provisions of Subsection (2), any person who is employed by or works for any employer and who receives or is entitled to receive any remuneration or who works under the direction or supervision of an employer or any other person.

Employer-Means, subject to the provisions of Subsection (2), any person who employs or provides work for any person or remunerates that person or expressly or tacitly undertakes to remunerate him, but excludes a labour broker as defined in Section 1(1) of the Labour Relations Act, 1953 (Act No. 28 of 1956).

Healthy -Means free from illness or injury attributable to occupational causes.

Health and Safety File –means a file, or other record containing the information in writing required by the Construction Regulations;

Health and Safety Plan–means a site, activity or project specific documented plan in accordance with the client's health and safety specification;

Health and Safety Specification–means a site, activity or project specific document prepared by the client pertaining to all health and safety requirements related to construction work;

Method Statement–means a document detailing the key activities to be performed in order to reduce as reasonably as practicable the hazards identified in any risk assessment;

Principal contractor-means an employer appointed by the client to perform construction work;

Risk Assessment–means a program to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard.

Machinery -Means any article or combination of articles assembled, arranged or connected and which is used or intended to be used for converting any form of energy to performing work, or which is used or intended to be used, whether incidental thereto or not, for developing, receiving, storing, containing, confining, transforming, transmitting, transferring or controlling any form of energy.

Medical Surveillance- Means a planned programme of periodic examination (which may include clinical examinations, biological monitoring or medical tests) of employees by an occupational health practitioner or, in prescribed cases, by an occupational medicine practitioner.

Plant- Includes fixtures, fittings, implements, equipment, tools and appliances, and anything which is used for any purpose in connection with such plant.

Properly Used- Means used with reasonable care, and with due regard to any information, instruction or advice supplied by the designer, manufacturer, importer, seller or supplier.

APPLICATIONS AND INTERPRETATION

This document is to be read and understood in conjunction with the following, inter- alia:

- Occupational Health and Safety Act 85 of 1993 (OHS Act).
- All regulations published in terms of the OHS Act.
- Construction Regulations, 2014
- SABS codes referred to by the OHS Act.

- Contract Documents
- Basic Conditions of Employment Act (Act 75 of 1997)
- National Environmental Management Act 107 of 1998 and all Regulations
- Compensation for Occupational Injuries and Diseases (COID) Act No. 130 of 1993

PART A - GENERAL OCCUPATIONAL HEALTH AND SAFETY

1. INTRODUCTION

1.1. INTRODUCTION AND BACKGROUND

In terms of the Construction Regulation 5 (1) of the OHS ACT, the client is required to compile an Occupational Health and Safety Specification for an intended project, highlighting all risks not successfully eliminated during design.

The Principal Contractor and contractors shall be responsible for the Health & Safety Policy for the site in terms of Section 7 of the Act and in line with Construction Regulation 7 as well as the Health and Safety Plan for the project.

This 'Health and Safety Specifications' document is governed by the "Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), hereinafter referred to as 'The Act'. It should be noted that no single Act or it's set of Regulations be read in isolation. Furthermore, although the definition of Health and Safety Specifications stipulates 'a documented specification of all health and safety requirements pertaining to associated works on a construction site, so as to ensure the health and safety of persons', it is required that the entire scope of the Labour Legislation, including the Basic Conditions of Employment Act be considered as part of the legal compliance system. With reference to this specification document this requirement is limited to all health, safety and environmental issues pertaining to the site of the project as referred to here-in. Despite the foregoing it is reiterated that environmental management shall receive due attention.

This document forms an integral part of the contract between the client and The Principal Contractor. The Principal Contractor and its Contractors shall furthermore implement any reasonable practicable means to ensure compliance to this Occupational Health and Safety

Specification and any other applicable legislation on their organization and/or activities performed by or for them. Compliance with this document does not absolve The Principal Contractor from complying with any other minimum legal requirement and The Principal Contractor remains responsible for the health and safety of his employees, those of his mandatories as well as any person coming on site or on adjacent properties as far as it relates to the construction activities.

1.2. PURPOSE OF THE CONSTRUCTION HEALTH AND SAFETY SPECIFICATION

The purpose of the construction H&S specification is to assist with the achievement of compliance with the OHS Act, and in particular with the Construction Regulations, so as to reduce incidents and injuries on the project.

The construction specification sets out the basic requirements to be met by the Contractor and all sub-contractors so that the H&S of all persons potentially at risk may receive a priority at least equal to the other facets of the project such as the standard of workmanship, costs, programme, environment, etc.

2. SCOPE OF HEALTH AND SAFETY SPECIFICATION DOCUMENT

This health and safety (H&S) specification is the Client's H&S specification prepared in accordance with Clause 5(1)(b) of the Construction Regulations. It covers the requirements for eliminating and mitigating incidents and injuries during the construction phase of the project. The specification addresses legal compliance, hazard identification and risk assessment, risk control, and promoting a health and safety culture amongst those working on the project. The specification also makes provision for the protection of those persons other than employees of the Principal Contractor and Contractors.

These Specifications should be read in conjunction with the OHS Act 85, 1993 and its Regulations with specific reference to the Construction Regulations. This will also include any Safety Standards which were or will be promulgated under the Act or incorporated into

the Act and be in force or come into force during the effective duration of the project. The stipulations in this specification, as well as those contained in all other documentation pertaining to the project, including contract documentation and technical specifications shall not be interpreted, in any way whatsoever, to cancel or nullify any stipulation of the Act, Regulations and Safety Standards which are promulgated under, or incorporated into the Act.

The Principal Contractor / Contractor is required to comply with the provisions of the Health and Safety Specification in order to reduce to a level as low as is reasonably practicable, the risks associated with the contract work that may lead to incidents causing injury or ill-health

Application of construction work Permit

- The Municipality shall apply for the above permit 30 days prior to the commencement of construction work that will be carried out.
- Construction work can only commence after receipt of and confirmation of construction permit approval.
- No construction work contemplated in sub-regulation 3 (1) may be commenced or carried out before the construction work permit and number contemplated have been issued and assigned.
- The “Application for Construction Work Permit” shall be similar in format to Annexure 1 in the Construction Regulations.
- A copy of the “Application for Construction Work Permit” to the Provincial Director and a copy of the construction work permit must form part of the Principal Contractor’s site H&S File.

The client's agent will apply construction work permit to the department of Labour. The Principal
Contractor is required to comply on all requirement needed to apply the permit

3. OCCUPATIONAL HEALTH AND SAFETY POLICY

The Principal Contractor has to provide the Client, as an annexure to the Health and Safety Plan, with a detailed Health and Safety Policy outlining The Principal Contractor's stance on and principles adopted for Health and Safety.

The Client 's commitment to Occupational Health and Safety Management

Sekhukhune District Municipality is committed to be responsible for occupational health and safety management, this commitment is essential to protect the environment, employees, mandatories, visitors and provide a work environment conducive to health and safety. The Principal Contractor and their Sub Contractors shall demonstrate their commitment and concern by:

- Ensuring that decisions and practices affecting occupational health and safety performance are consistent with the issued specification;
- Ensuring adequate resources are made available for the effective implementation of occupational health and safety control and mitigation measures;
- Participating in hazard identification and risk assessments and design safety reviews;
- Communicating occupational health and safety management processes, strategies and control measures with all levels of employees, contractor and/or visitors;
- Ensuring visible leadership at all sites;
- Promoting and enforcing the use of correct types of Personal Protective Equipment (PPE);
- Reporting and investigation of incidents and accidents and ensuring actions are identified and implemented to prevent similar types of incidents reoccurring;
- Participating in Client audits and meetings and ensuring required actions are implemented within reasonable time frames on the site/project;
- Recognizing and commending safe work practices and coaching employees who require guidance;

- Applying and enforcing consequence management from deviations and transgressions of/from compliance to this OHS Specification noted and/or observed, where applicable;
- Carrying out safety observations, implement corrective and preventative actions and giving immediate feedback;
- Encouraging employee participation in the formulation of work instructions and safety rules.

4. OCCUPATIONAL HEALTH & SAFETY MANAGEMENT

The Occupational Health and Safety Act and all its Regulations, with the exception of the Construction Regulations, distinguish between the roles, responsibilities and functions of employers and employees respectively. It views consultants and contractors as employees of the

"owner" of a construction or operational project, the "owner" being regarded as the employer. Only if formally agreed to by way of the written agreement in this regard between the "owner(s)" and consultant and /or between the "owner(s)" and the contractor(s), will these assumptions be relinquished in favour of the position agreed upon and between the relevant parties.

Table 1: ***Structure and Organization of OH&S Responsibilities***

ROLE	RESPONSIBILITIES
Client Client Agent	**The Client and/or its Agent** shall ensure that the Principal Contractor, appointed in terms of Construction Regulation 5(1) (k), implements and maintains the agreed and approved Health and Safety Plan. Failure on the part of the Client or Agent to comply with this requirement will not relieve the Principal Contractor from any duties under the Act and Regulations.

CEO – Principle Contractor	**The Chief Executive Officer** of the Principal Contractor in terms of Section 16 (1) of the OHS Act to ensure that the Employer (as defined in the Act) complies with the Act. The pro forma Legal Compliance Audit may be used for this purpose by the Principal Contractor or his/her appointed contractor.
Person responsible for Health and Safety Section 16(2)	All OHS Act (85 /1993), **Section 16 (2)** appointee/s as detailed in their respective appointment forms shall regularly, in writing, report to management on health and safety matters or deviations identified during routine or ad hoc inspections/ audits. All reports shall be made available to the principal Contractor to become part of their site records (Health & Safety File).
Construction Manager Or Assistant	The Construction Manager and Assistant Construction Supervisor/s appointed in terms of Construction Regulation 8 shall regularly, in writing, report to their managers on health and safety matters or deviations identified during inspections. All reports shall be made
	available to the principal Contractor to become part of site records (Health & Safety File).
SHE Representatives	All Health and Safety Representatives (SHE-Reps) shall act and report as per Section 18 of the OHS Act. She Representatives shall inspect and monitor activities on a daily basis and report findings to the Client and Health and Safety manager immediately. These safety representatives have the right to stop any unsafe work or work due to unsafe conditions and report findings and reason immediately.

Other Legal Appointees	**Further (Specific) Supervision Responsibilities for OH&S** Several appointments or designations of responsible and /or competent people in specific areas of construction work are required by the OHS Act and Regulations. The following competent appointments, where applicable, in terms of the Construction Regulations are required to ensure compliance to the Act, Regulations and Safety Standards.

5. REQUIRED APPOINTMENTS AS PER THE CONSTRUCTION REGULATIONS

Table 2: Required appointments as per the construction regulations

LEGAL APPOINTMENTS AS REQUIRED IN THE CONSTRUCTION REGULATIONS			
Item	Construction Regulation	Appointment	Responsible Person
1.	5(1)(h)	Principal contractor for each phase or project	Client / Agent
2.	6	Designer	Client / Agent
3.	7(1)(c)(v)	Contractor	Principal Contractor
4.	7(2)(c)	Sub-Contractor	Contractor
5.	8(1)	Construction Manager	Principal Contractor
6.	8(2)	Assistant Construction Manager	Principal Contractor
7.	8(6)	Construction Safety Officer	Principal Contractor & Contractor
8.	8(7)	Construction Supervisor	Construction Manager
9.	8(8)	Assistant Construction Supervisor	Principal Contractor & Contractor

10.	9(1)	Person to carry out risk assessment	Principal Contractor & Contractor
11.	9(4)	Trainer/Instructor	Principal Contractor & Contractor
12.	10(1)(a)	Fall protection officer	Principal Contractor & Contractor
13.	11(2)	Competent structure inspector	Owner
14.	6(2) & 12(1)	Temporary Works Designer	Principal Contractor & Contractor
15.	12(2)	Temporary Works Supervisor	Principal Contractor & Contractor
16.	13(1)(a)	Excavation supervisor	Principal Contractor & Contractor
17.	13(2)(b)(ii)(bb)	Professional engineer or technologist	Principal Contractor & Contractor
18.	13(2)(k)	Explosives expert	Principal Contractor & Contractor
19.	14(1)	Supervisor demolition work	Principal Contractor & Contractor
20.	14(2) + (3)	Demolition expert	Principal Contractor & Contractor
21.	14(11)	Explosives expert	Principal Contractor & Contractor
22.	17(1)	Suspended platform supervisor	Principal Contractor & Contractor

23.	17(2)(c)	Compliance plan developer	Principal Contractor & Contractor
24.	17(8)(c)	Suspended platform expert	Principal Contractor & Contractor
25.	17(13)	Outrigger expert	Principal Contractor & Contractor
26.	20(1)	Bulk mixing plant supervisor	Principal Contractor & Contractor
27.	20(2)	Bulk mixing plant operator	Principal Contractor & Contractor
28.	21(2)(b)	Explosive actuated fastening device expert	Principal Contractor & Contractor
29.	21(2) (g) (i)	Explosive actuated fastening device controller	Principal Contractor & Contractor
30.	22(a)	Tower crane supervisor	Principal Contractor & Contractor
31.	22(e)	Tower crane operator	Principal Contractor & Contractor
32.	23(1)(d)(i)	Construction vehicle and mobile plant operator	Principal Contractor & Contractor
33.	23(1)(k)	Construction vehicle and mobile plant inspector	Principal Contractor & Contractor
34.	24(d)	Temporary electrical installations inspector	Principal Contractor & Contractor
35.	24 (e)	Temporary electrical installations controller	Principal Contractor & Contractor

36.	28 (a)	Stacking and storage supervisor	Principal Contractor & Contractor
37.	29 (h)	Fire equipment inspector	Principal Contractor & Contractor

5. DUTY TO INFORM

Without derogating from any specific duty imposed on the Contractor by this Act, the Principal Contractor shall:

- As far as is reasonably practicable, cause every employee to be made conversant with the SHE hazards attached to any work which he has to perform, any article or substance which he has to produce, process, use, handle, store or transport and any plant or machinery which he is required or permitted to use, as well as with the precautionary measures which should be taken and observed with respect to those hazards;
- Inform the SHE representatives concerned beforehand of inspections, investigations or formal inquiries of which he has been notified by an inspector, and of any application for exemption made by him in terms of section 40 of the Act; and
- Inform a SHE representative as soon as reasonably practicable of the occurrence of an incident in the workplace or section of the workplace for which such representative has been designated.

Duty not to interfere with, damage or misuse things —

The Principal Contractor shall ensure that no person under his/her control shall intentionally or recklessly interfere with, damage or misuse anything, which is provided in the interest of SHE protection.

6. RESPONSIBILITIES

6.1. Client

- The Client or his appointed Agent on his behalf will appoint each Principal Contractor for this project or phase/section of the project in writing for assuming the role of Principal Contractor as intended by the Construction Regulations and determined by the Bills of Quantities.
- The Client or his appointed Agent on his behalf shall discuss and negotiate with the Principal Contractor the contents of the health and safety plan of the both Principal Contractor and Contractor for approval.
- The Client or his appointed Agent on his behalf, will take reasonable steps to ensure that the health and safety plan of both the Principal Contractor and Contractor is implemented and maintained. The steps taken will include periodic audits at intervals of at least once every month.
- The Client or his appointed Agent on his behalf, will prevent the Principal Contractor and/or the Contractor from commencing or continuing with construction work should the Principal Contractor and/or the Contractor at any stage in the execution of the works be found to:
- have failed to have complied with any of the administrative measures required by the Construction Regulations in preparation for the construction project or any physical preparations necessary in terms of the Act;
- have failed to implement or maintain their health and safety plan;
- have executed construction work which is not in accordance with their health and safety plan; or
- Act in any way which may pose a threat to the health and safety of any person(s) present on the site of the works or in its vicinity, irrespective of him/them being employed or legitimately on the site of the works or in its vicinity.

6.2. Principal Contractor

- The Principal Contractor shall accept the appointment under the terms and Conditions of Contract. The Principal Contractor shall sign and agree to those terms and conditions and shall, before commencing work, notify the Department of Labour of

the intended construction work in terms of Regulation 4 of the Construction Regulations, which stipulates “Notification of Construction Work” form. The Principal Contractor shall submit the notification in writing prior to commencement of work and inform the Client or his Agent accordingly.

- The Principal Contractor shall ensure that he is fully conversant with the requirements of this Specification and all relevant health and safety legislation. This Specification is not intended to supersede the Act nor the Construction Regulations or any part of either. Those sections of the Act and the Construction Regulations which apply to the scope of work to be performed by the Principal Contractor in terms of this contract (entirely or in part) will continue to be legally required of the Principal Contractor to comply with. The Principal Contractor will in no manner or means be absolved from the responsibility to comply with all applicable sections of the Act, the Construction Regulations or any Regulations proclaimed under the Act or which may perceivable be applicable to this contract.
- The Principal Contractor shall provide and demonstrate to the Client a suitable and sufficiently documented health and safety plan based on this Specification, the Act and the Construction Regulations, which shall be applied from the date of commencement of and for the duration of execution of the works. This plan shall, as appendices, include the health and safety plans of all Sub-contractors for which he has to take responsibility in terms of this contract.
- The Principal Contractor shall provide proof of his registration and good standing with the Compensation Fund or with a licensed compensation insurer prior to commencement with the works.
- The Potential Principal Contractor shall, in submitting his tender, demonstrate that he has made provision for the cost of compliance with the specified health and safety requirements, the Act and Construction Regulations. (Note: This shall have to be contained in the conditions of tender upon which a tenderer’s offer is based.)
- The Principal Contractor shall consistently demonstrate his competence and the adequacy of his resources to perform the duties imposed on the Principal Contractor in terms of this Specification, the Act and the Construction Regulations.

- The Principal Contractor shall ensure that a copy of his health and safety plan is available on site and is presented upon request to the Client, an Inspector, Employee or Subcontractor.
- The Principal Contractor shall ensure that a health and safety file, which shall include all documentation required in terms of the provisions of this Specification, the Act and the Construction Regulations, is opened and kept on site and made available to the Client or Inspector upon request. Upon completion of the works, the Principal Contractor shall hand over a consolidated health and safety file to the Client.
- The Principal Contractor shall, throughout execution of the contract, ensure that all conditions imposed on his Sub-contractors in terms of the Act and the Construction Regulations are complied with as if they were the Principal Contractor.
- The Principal Contractor shall from time to time evaluate the relevance of the Health and Safety Plan and revise the same as required, following which revised plan shall be submitted to the Client and/or his/her Agent for approval.

7. HEALTH AND SAFETY REPRESENTATIVE(S)

The Principal Contractor and all Contractors shall ensure that Health and Safety Representative(s) are appointed under consultation and trained to carry out their functions **(applicable when 20 or more persons are employed).** The appointment must be in writing. The Health and Safety Representative shall carry out regular inspections, keep records and report all findings to the Responsible Person forthwith and at health & safety meetings. The duties and responsibilities of the SHE representative are defined in section 19 of the Act. The Client may request the appointment of a Health and Safety Representative if there are less than 20 employees on the construction site.

8. HEALTH AND SAFETY COMMITTEES

The Principal Contractor shall ensure that project health and safety meetings are held monthly and minutes are kept on record meetings must be organized and chaired by The Principal Contractor's Responsible Person **(applicable when 50 or more persons are employed)**. All Contractors Responsible Persons and Health & Safety Representatives shall attend the monthly health & safety committees in accordance with the OHS Act 85/1993 and minutes of their meetings shall be forwarded to the Principal Contractor on a monthly basis.

Members of this committee shall be appointed in writing and shall meet at least monthly and the meeting Agenda shall contain the following but not limited to:

Agenda:

- Opening & Welcome;
- Present/Apologies/Absent;
- Minutes of previous Meeting;
- Matters Arising from the previous Minutes;
- SHE Representatives Reports;
- Incident Reports & Investigations;
- Incident /Injury Statistics;
- Other Matters;
- Endorsement of Registers and other statutory documents by a representative of the Principal Contractor;
- Close/Next Meeting.

9. SITE SPECIFIC WORKS INFORMATION

These specifications are applicable to the specific scope of work pertaining to the construction of Internal Water Reticulation.

9.1. EXTENT OF THE WORKS

This project comprises the construction of the following:

a. Installation of approximately 75 to 200mm diameter water pipelines. All pipes are mPVC with pressure ratings PN9 to PN12

b. Ancillary works such as valve champers with pipe work relevant control mechanisms, thrust blocks

c. Valve boxes and chambers

d. Fire hydrants

e. Yard connections

f. Construction of river ,channel and road crossings

g. Disinfecting of the pipe line

h. Testing of the pipe line

The Principal contractor should outline on the SHE plan the handling and storing of the above material.

10. HEALTH AND SAFETY FILE

The Principal Contractor must, in terms of Construction Regulation 7(1)(b), keep a Health & Safety File on site at all times that must include all documentation required in terms of the Act and

Regulations and must also include a list of all Contractors on site that are accountable to the Principal Contractor and the agreements between the parties and details of work being done.

A more detailed list of documents and other legal requirements that must be kept in the Health and Safety File. The file must contain the following documents but not limited to:

- Notification of Construction Work/Construction permit
- Copy of Act and applicable Regulations;
- Proof of Registration and letter of good standing with a compensation fund;
- Occupational Health & Safety Plan agreed with the Client including the underpinning Risk Assessment/s & (Copies of SHE Committee and other relevant Minutes;
- Copy of SHE policies, HIV/AIDS policy
- Accident and incident register and investigation forms
- Appointment forms
- Completed inspection checklists, audits
- Training and competency records
- Designs / drawings;
- Risk/Hazard assessment plan.
- A list of Contractors (Sub-Contractors) including copies of the agreements between the parties and the type of work being done by each Contractor
- Copies of 37(2) appointments in terms of Act
- Monthly Statistical monitoring of OHS incidents
- Section 37.2 agreements
- Monthly contractor reports of close outs to OHS Non-conformities reported by SHE agents.

Upon completion of the Works, the Contractor shall hand over the consolidated health and safety file to the Employer.

11. HAZARD IDENTIFICATION AND RISK ASSESSMENT

This section of the specification provides guidelines for The Principal Contractor in preparation of risk assessments in order to ensure compliance with Regulation 9 of the Construction Regulations, 2014. Risk is the overall process of risk identification, risk

analysis, and risk evaluation. This section highlights the principles related to the preparation of suitable and sufficient risk assessments. The Principal Contractor Staff intending to prepare risk assessments should be trained and suitably experienced in the application envisaged.

11.1. Development of Risk Assessments

Every Principal Contractor / Contractor performing Construction Work shall, before the commencement of any Construction Work or work associated with the aforesaid Construction Work and during such work, cause a Risk Assessment to be performed by a competent person, appointed in writing, and the Risk Assessment shall form part of the SHE Plan and be implemented and maintained as contemplated in applicable Construction Regulation. A copy of the risk assessment shall be available on site at all times for inspection.

The risk assessment (inclusive of impact assessment) shall include (at a minimum):

- Identification of the relevant Sekhukhune District Municipality Project with regard to Contract name, Number, Project name and area;
- Date on which risk assessments were conducted / reviewed;
- The identification of the risks / hazards and aspects / impacts to which persons may be exposed to per activity;
- The analysis and evaluation of the risks / hazards and aspects / impacts identified;
- Existing control measures and proposed corrective measures;
- A plan to review the risk assessments as the work progresses and changes are introduced; • Identification of significant risks (e.g. high; exceeding 75%);
- A documented plan of Safe Working Procedures (SWP)', and its relevance to the risk assessment, inclusive of method statements, to mitigate, reduce or control the risks and hazards that have been identified;
- A plan to monitor the application of the Safe Working Procedures (SWP);
- Signature of appointed competent person conducting risk assessment; and

- Signature of approval by Principal Contractor management and employees involved in risk assessment.

Based on the Risk Assessments, the Principal Contractor / Contractor shall develop a set of site-specific Safe Work Procedures (SWP's)/ that will be applied to regulate the SHE aspects of the construction.

The Contractor shall at all times carry out the Works in a manner to avoid the risk of physical harm to persons or risk of damage to any property or the environment.

The Contractor shall take all precautions, which are necessary and adequate to eliminate any conditions which contribute to the risk of injury to persons or damage to property or the environment.

The risk assessments, together with the site-specific occupational health and safety rules, must be submitted to the Municipality before mobilisation on site commences. These will be included in the SHE plan. The Contractor shall ensure through his risk management process the hierarchy of controls stipulated as follows, are implemented:

- Eliminate - The complete elimination of the hazard.
- Substitute - Replacing the material or process with a less hazardous one.
- Redesign - Redesign the equipment or work process.
- Separate - Isolating the hazard by guarding or enclosing it.
- Administrate - Providing control such as training, procedures etc.
- Personal Protective Equipment (PPE) - Use of appropriate and properly fitted PPE where other controls are not practical. (PPE as the last resort) The Principal Contractor will be required to carry out the following three forms of risk assessment:
- Baseline risk assessment;
- Issue based risk assessment;
- Continuous risk assessments.

11.2. Forms of Risk Assessment

In order to ensure compliance with the Construction Regulations, The Principal Contractor will be required to carry out the following three forms of risk assessment:

1. Baseline risk assessment

The Principal Contractor will be required to carry out activity-based risk assessment before the commencement of construction activities on the Works, this risk assessment will form part of The Principal Contractor Health and Safety Plan. The risks and hazards to which persons, plant, vehicles and facilities may be exposed during the construction of the Works should be identified and evaluated. Measures to reduce or control these risks or hazards should be defined during this assessment. The effectiveness of the measures defined and the baseline risk assessment prepared by the client shall be monitored and reviewed from to time to ensure that it remains relevant and accurate.

2. Issue based risk assessments

The Principal Contractor will be required to carry out separate risk assessments during construction of the Works when methods and procedures are varied, for example when:

- Designs are amended,
- New machines are introduced,
- Plant is periodically cleaned and maintained,
- Plant is started-up or shut-down,
- Systems of work change or operations alter,
- Incidents or near-misses occur

3. Continuous risk assessments

Occupational Health and Safety Act specifically requires that employers shall provide and maintain working environments that are safe and risk to health. The general awareness of hazards needs to be raised as work ethic to maintain a safe and risk-free environment on an ongoing basis. This is achieved by continuous risk assessment, the most important form

of risk assessment that takes place as an integral part of day-to-day management. Examples of continuous risk assessment include:

- Regular audits,
- Maintaining general hazard awareness,
- Pre-work risk assessment

11.3. Review of Risk Assessments

The Principal Contractor / Contractor shall review the Hazard Identification, Risk Assessments and SWP's as the construction work develops and progresses and each time changes are made to the designs, plans and construction methods and processes.

The Principal Contractor / Contractor shall provide the Sekhukhune District Municipality and other Contractors with copies of any changes, alterations or amendments of the above-mentioned review.

12. HAZARDS AND POTENTIAL SITUATIONS

The Principal Contractor shall immediately notify other Contractors as well as the Clients Agent of any hazardous or potentially hazardous situations that may arise during performance of construction activities. Hazards to be taken into account;

- **Machine Hazards, (**Moving machinery Machine running out of control. Machine coming in contact with operator or employees body parts etc.**),**
- **Energy Hazard**s**, (**Live electricity underground overhead, portable generators and hand tools etc.**),**
- **Material Handling Hazards** (heavy loads and hot materials),

- **Work Practices Hazards,** (Working at heights and elevated positions, excavations tripping and falling, Plant and Tools, noise, Insects, Snakes, Ticks, Bees and ergonomics**)**
- **Moving Vehicle Hazards,** (Vehicles generating fumes and dust, unguarded machine parts and belts etc,**),**
- **Hazardous Chemical Hazards,** (Asbestos dust on ceilings, Asbestos containing materials, Lead dust, dust, Cement, mortar, concrete and other chemicals to be used)
- **Weather conditions.** (Extreme hot and cold weather conditions)

13. NOTIFICATION OF CONSTRUCTION WORK

The Principal Contractor shall, where the Contract meets the requirements laid down in the Construction Regulation, within 5 working days of appointment, notify the Department of Labour of the intention to carry out construction work and use the applicable form (from applicable Construction Regulations) for the purpose. A copy shall be kept on file.

14. AUDITING, REPORTING AND CORRECTIVE ACTIONS

The client will conduct at least, a once monthly Health & Safety audit of the work operations including a full audit of physical site activities as well as an audit of the administration of health & safety. The Principal Contractor is obligated to conduct similar audits or all contractors appointed by it. Detailed reports of the audit findings and results shall be reported on at all levels of project management meetings/forums. Copies of the Client audit reports shall be kept in the Primary Project Health & Safety File while the Principal Contractor audit reports shall be kept in their File, a copy being forwarded to the Client. Contractors have to audit their sub-contractors and keep records of these audits in their health & safety files, available on request. These audits must be conducted by a competent person.

Inspections by SHE Representative's and Other Appointees

Occupational Health and Safety Representatives shall conduct weekly inspections of their areas of responsibility and report thereon to their foreman or supervisor whilst other appointees shall conduct inspections and report thereon as specified in their appointments e.g. vehicle, plant and machinery drivers, operators and users must conduct daily inspections before start-up.

Recording and Review of Inspection Results

All the results of the abovementioned inspections are to be reported in writing, reviewed by the Occupational Health and Safety Committee, endorsed by the chairman of the meeting and kept on file.

15. CONSULTATION, COMMUNICATION AND LIAISON

All SHE liaison between the Client, the Principal Contractor, other Contractors, the Designer, the Principal Agent and other concerned parties shall be through the SHE committee.

In addition to the above, communication may be directly to the Client or his appointed Agent, in writing, as and when the need arises.

Consultation with the workforce on SHE matters shall be through their Supervisors, SHE Representatives, the SHE committee and their elected Trade Union Representatives, if any.

The Principal Contractor / Contractor shall be responsible for the dissemination of all relevant SHE information to other Contractors e.g. design changes agreed with the Client and the Designer, instructions by the Client and/or his/her Agent, exchange of information between Contractors, the reporting of hazardous/dangerous conditions/situations etc.

16. TRAINING, AWARENESS, PROMOTION AND COMPETENCE

The Principal Contractor/Contractor shall include training certificates of appointed/designated personnel in the Health and Safety Plan.

16.1. Site Specific SHE Induction Training

The Principal Contractor / Contractor shall develop project specific SHE Induction Training based on the Risk Assessments and ensure that all employees receive induction training. No employees shall be allowed on site unless in possession of valid proof of induction training and identification at all times.

16.2. Other Training

All operators, drivers and users of construction vehicles, mobile plant and other equipment shall be in possession of valid proof of training.

All employees in jobs requiring training in terms of the Act and Regulations shall be in possession of valid proof of training.

Failure to adhere to the above mentioned will result in the operator's eviction from site and no delay claims will be entertained by the client.

OH&S Training Requirements: (as required by the applicable Construction Regulations and as indicated by the OH&S Specification & the Risk Assessment/s):

- General Induction (Section 8 of the Act)
- Site/Job Specific Induction (also visitors) (Sections 8 & 9 of the Act)
- Site/Project Manager
- Construction Supervisor
- SHE Representatives (Section 18 (3) of the Act)
- Operators & Drivers of Construction Vehicles & Mobile Plant (Construction Regulation)

- Basic Fire Prevention & Protection (Applicable Environmental Regulations and Construction regulation)
- Basic First Aid (General Safety Regulations)
- Storekeeping Methods & Safe Stacking (Construction Regulation) • Emergency, Security and Fire Co-coordinator

16.3. Awareness & Promotion

The Principal Contractor / Contractor shall develop and implement a SHE promotion and awareness scheme for all employees and others affected by work activities. The following are some of the methods that may be used:

- Toolbox Talks
- SHE Posters
- Videos
- Competitions
- Suggestion schemes
- Participative activities such as SHE circles.

16.4. Competence

The Principal Contractor / Contractor shall ensure that his and other Contractors personnel appointed are competent and that all training required to do the work safely and without risk to health, has been completed before work commences.

The Principal Contractor / Contractor shall ensure that follow-up and refresher training is conducted as construction work progresses and the work situation changes. Records of all training shall be kept in the OH&S file for auditing purposes.

16.5. Medical certificate of fitness

The Principal Contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3 of the Construction Regulations 2014.

17. LEGAL INSPECTION REGISTERS

The Principal Contractor / Contractor shall conduct all prescribed inspections. All registers shall be kept on file and Sekhukhune District Municipality reserves the right to inspect all legal compliance registers.

- Accident/Incident Register (Annexure 1 of the General Administrative Regulations);
- OH&S Representatives Inspection Register;
- Asbestos Demolition & Stripping Register;
- Batch Plant Inspections;
- Construction Vehicles & Mobile Plant Inspections by Controller;
- Daily Inspection of Vehicles. Plant and other Equipment by the operator/Driver/User;
- Demolition Inspection Register;
- Designer's Inspection of Structures Record;
- Electrical Installations, -Equipment & -Appliances (including Portable Electrical Tools);
- Excavations Inspection;
- Explosive Powered Tool Inspection/Maintenance/Issue/Returns Register (incl. cartridges & nails);
- Fall Protection Inspection Register;
- First Aid Box Contents;
- Fire Equipment Inspection & Maintenance;
- Formwork & Support work Inspections;
- Hazardous Chemical Substances Record;

- Ladder Inspections;
- Lifting Equipment Register;
- Materials Hoist Inspection Register;
- Machinery Safety Inspection Register (incl. machine guards, lock-outs etc.);
- Scaffolding Inspections;
- Stacking & Storage Inspection;
- Inspection of Structures;
- Inspection of Suspended Platforms;
- Inspection of Tunnelling Operations;
- Inspection of Vessels under Pressure;
- Welding Equipment Inspections;
- Oxy-Acetylene equipment inspections;
- Inspection of Work conducted on or Near Water;
- All other applicable records;

18. INCIDENT INVESTIGATION AND REPORTING

The Principal Contractor shall report all incidents where an employee is injured on duty to the extent that he/she:

- Dies;
- Becomes unconscious;
- Loses a limb or part of a limb;
- Is injured or becomes ill to such a degree that he/she is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he/she was usually employed.
  or where:
- a major incident occurred;
- the health or safety of any person was endangered (this could be a near miss);
- where a dangerous substance was spilled;

- the uncontrolled release of any substance under pressure took place;
- machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects;
- machinery ran out of control.

to the Provincial Director of the Department of Labour within seven days and at the same time to

the Client or its Agent.

19. SITE RULES AND OTHER RESTRICTIONS

19.1. Site OH&S Rules

The Principal Contractor must develop a set of site-specific Health and Safety Rules that will be applied to regulate the Health and Safety Plan and associated aspects of the construction project.

When required for a site by law, visitors and non-employees upon entering the site shall be issued with the proper Personal Protective Equipment (PPE) as and when necessary.

19.2. Security Arrangements

- The Principal Contractor must establish site access rules and implement and maintain these throughout the construction period. Access control must include the rule that nonemployees shall at all times be provided with fulltime supervision while on site;
- Additional Access Rules may be imposed by the Project Manager or Client Agent in the interest of the safety of the employees, visitors and customers;
- The Principal Contractor must develop a set of Security rules and procedures for their allocated site and maintain these throughout the construction period. These security rules must be submitted to the Client for approval. Additional security measures or rules may be specified for risk minimisation purposes;

- If not already tasked to the H&S Officer appointed in terms of Construction Regulation 8(6), the Principal Contractor must appoint a competent Emergency Controller who must develop contingency plans for any emergency that may arise on site as indicated by the risk assessments. These must include a monthly practice/testing programme for the plans e.g. January: trench collapse, February: flooding etc. and practiced/tested with all persons on site at the time, participating.

20. EMERGENCY PROCEDURES

The Principal Contractor shall prepare a detailed emergency procedure prior to commencement of work on site and it shall be included in, and form part of, the H&S plan. The procedure shall be updated whenever changes occur and it shall detail the emergency response plans. The emergency procedures shall not be limited to, but shall include, the following key elements:

- List of key competent personnel on site;
- Details of the nearest emergency services, including their physical addresses and phone numbers;
- Actions or steps to be taken in the event of each specific type of emergency;
- Information on hazardous materials/situations that may be encountered on site.

Emergency procedures shall include, but shall not be limited to, fire, spills, accidents to employees, use of hazardous substances, bomb threats, and major incidents/accidents.

A contact list of all service providers (Fire Department, Ambulance, Police, Medical and Hospital, etc) must be maintained and be readily available to site personnel at all times that there are persons on site i.e. it must not be located in an area which may be inaccessible outside of normal working hours.

The Principal Contractor shall advise the Client and the Engineer in writing forthwith, and thereafter at the project and H&S meetings, of any emergencies that occurred, together with a record of the action taken. Copies of all reports on emergencies shall be kept in the Project H&S File.

21. FIRST AID BOXES AND FIRST AID EQUIPMENT

The Principal Contractor and all other Contractors shall appoint First Aider(s) in writing. All Contractors with more than 10 employees shall have a trained, certified First Aider on site at all times. The appointed First Aider(s) are to be sent for accredited first aid training. Copies of the valid First Aid certificates for each First Aider are to be kept in the Project H&S File. The Principal Contractor shall provide an on-site First Aid Station with First Aid facilities, including first aid boxes adequately stocked at all times. All Contractors with more than 5 employees shall supply their own first aid box(es).

The Contractor shall provide a safety notice board where safety notices, site regulations concerning safe working practices and information on the nearest first aid station, ambulance, doctor and telephone numbers of the safety officer and other relevant persons can be conspicuously displayed to all its staff.

The Contingency Plan of the Principal Contractor / Contractor shall include the arrangements for speedily and timeously transporting injured / ill person/s to a medical facility or of getting emergency medical aid to person/s that may require it.

The Principal Contractor / Contractor shall have firm arrangements with his other contractors in place regarding the responsibility of the other Contractor's injured / ill employees.

22. FIRE PREVENTION AND PROTECTION

Subject to the provisions of the Environmental Regulations for Workplaces promulgated by Government Notice No. R.2281 of 16 October 1987, as amended. The Principal Contractor / Contractor shall at all times ensure that:

- All appropriate measures are taken to avoid the risk of fire;
- Sufficient and suitable storage is provided for flammable liquids, solids and gases;
- Smoking is prohibited and notices in this regard are prominently displayed in all places containing readily combustible or flammable materials;
- In confined spaces and other places in which flammable gases, vapours or dust can cause danger:
- Only suitably protected electrical installations and equipment, including portable lights, are used;
- There are no flames or similar means of ignition;
- There are conspicuous notices prohibiting smoking;
- Oily rags, waste and other substances liable to ignite are without delay removed to a safe place; and
- Adequate ventilation is provided;
- Combustible materials do not accumulate on the construction site;
- Welding, flame cutting and other hot work are done only after the appropriate precautions as required have been taken to reduce the risk of fire;
- Suitable and sufficient fire-extinguishing equipment is placed at strategic locations or as may be recommended by the Fire Chief or local authority concerned, and that such equipment is maintained in a good working order;
- The fire equipment is inspected by a competent person, who has been appointed in writing, in the manner indicated by the manufacturer thereof;
- A sufficient number of workers are trained in the use of fire- extinguishing equipment;
- Where appropriate, suitable visual signs are provided to clearly indicate the escape routes in the case of a fire;
- The means of escape is kept clear at all times;
- There is an effective evacuation plan providing for all:
- Persons to be evacuated speedily without panic;

- Persons to be accounted for; and
- Plant and processes to be shut down; and
- A siren is installed and sounded in the event of a fire.

23. CONSTRUCTION WELFARE FACILITIES AND LIVING ACCOMODATION

The Contractor shall ensure that the requirements governing Construction welfare facilities as indicated here below are carried out in terms of the applicable Construction Regulations.

The contractor shall, depending on the number of workers and the duration of the work, provide at or within reasonable access of every construction site, the following clean and maintained facilities:

- At least one shower facility for every 15 workers;
- At least one sanitary facility for every 30 workers;
- Changing facilities for each sex; and
- Sheltered eating areas.

The Contractor shall submit to the engineer for approval plans for the layout of temporary construction buildings, facilities, fencing, access routes and anchoring systems, 10 days before installation of such temporary structures.

Fencing

The contractor shall provide temporary fencing around the site camp and for all works carried out in areas of active utilization by members of the public.

Signage

Signs warning of presence of construction hazards and requiring unauthorized persons to keep

out of the construction area shall be posted on the fencing.

Living Accommodation

No employee accommodation will be allowed on site.

24. PERSONAL & OTHER PROTECTIVE EQUIPMENT

The Principal Contractor shall identify the hazards in the workplace and deal with them. Personal Protective equipment (PPE) should, however, be the last resort and there should always first be an attempt to apply engineering and other solutions to mitigating hazardous situations before the issuing of PPE is considered.

Where it is not possible to create an absolutely safe and healthy workplace the Contractor shall inform employees regarding this and issue, free of charge, suitable equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.

It is a further requirement that the Contractor maintain the said equipment, that he instructs and trains the employees in the use of the equipment and ensures that the prescribed equipment is used by the employee/s.

Employees do not have the right to refuse to use/wear the protective equipment prescribed by the employer and, if it is impossible for an employee to use or wear prescribed protective equipment through health or any other reason, the employee cannot be allowed to continue working under the hazardous condition/s for which the equipment was prescribed but an alternative solution has to be found that may include relocating or discharging the employee.

The Contractor may not charge any fee to an employee for protective equipment prescribed by him/her but may charge for equipment under the following conditions:

- Where the employee requests additional issue in excess of what is prescribed
- Where the employee has patently abused or neglected the equipment leading to early failure • Where the employee has lost the equipment

All employees shall, as a minimum, be required to wear the following PPE on site:

- **Hard hats** - All employees of the Contractor shall wear hard hats in areas where appropriate hazard notices are displayed. The Representative/Agent shall have the right to ban certain colours if they are similar to the Client's identifying colours. Hard hats shall not be painted or otherwise defaced.
- **Eye protection** - Suitable eye protection shall be worn in areas where appropriate hazard notices are displayed, or when grinding, chipping, breaking, drilling, arc-welding, cutting with oxyacetylene equipment of similar activities are taking place.
- **Musk**- Suitable and appropriate musk shall be worn in areas where appropriate hazard notices are displayed.
- **Hearing protection** - Suitable hearing protection shall be worn in areas where appropriate hazard notices are displayed.
- **Foot wear** - All employees of the Contractor shall wear undamaged, laced-up safety boots or safety shoes, suitable for the intended purpose, in prescribed areas where appropriate hazard notices are displayed.
- **Gloves** - All employees of the Contractor's shall wear suitable protective gloves in areas where appropriate hazard notices are displayed or when handling hot or hazardous materials or chemicals.
- **Clothing** - All employees of the Contractor shall wear suitable protective clothing when working in proximity of machinery, power tools, hazardous materials or chemicals.

Information and Training

Employees should be provided with the instructions/training on how to use their PPE safely. Workers who are required to wear personal protective equipment must be trained on how to do the following:

- Use protective equipment properly,
- Know what kind of protective equipment is necessary,
- How to put on, adjust, wear, and take off personal protective equipment,

- Understand the limitations of personal protective equipment in protecting workers from hazards exposed to

PPE Maintenance and Storage

Without proper maintenance, the effectiveness of PPE cannot be assured. All PPE must be regularly inspected, kept clean, maintained and easily accessible and stored in accordance with the manufacturer's specifications. Where PPE is shared, such as visitor hard hats, laboratory coats etc., the relevant supervisor must ensure that the PPE is maintained in a clean and hygienic condition.

Replacement of PPE

The employer must ensure that they replace employee PPE in every 6 months in a year, meaning that employee must be given PPE twice a year. There are however some basic warning signs that that shows that PPE needs replacing such as, rips, tears, holes, discoloration, degrading and soiling.

As an employer it's also your responsibility to train your staff about how to use, care and store their PPE, to ensure optimal safe usage and disposal of the product.

At the end of the day, you must ensure that PPE is provided to your team, they are using it and that it is clean, hygienic and in good working order. PPE is there to minimise any risks to your staff so it's best to keep a close eye on how your employees treat, care for and use their PPE.

25. PUBLIC AND SITE VISITOR HEALTH & SAFETY

Both the Client and the Principal Contractor have a duty in terms of the OHS Act to do all that is reasonably practicable to prevent members of the public and site visitors from being adversely affected by the construction activities.

The Principal Contractor shall ensure that every person working on or visiting the site, as well as the public in general, shall be made aware of the dangers likely to arise from site activities, including the precautions to be taken to avoid or minimise those dangers.

A site visitor's register is to be kept on site and steps are to be taken to ensure that all visitors sign the visitors' register before entering the site.

The Contractor shall not undertake any night work without prior arrangement and a written work permit from Engineer. The Contractor shall ensure that adequate lighting is provided for all night work and failure to do so shall result in work being stopped

The construction site shall be suitably and sufficiently fenced off/ barricaded and or provided with controlled access points to prevent the entry of unauthorized persons.

26. ALCOHOL AND OTHER DRUGS

An employer or a user, as the case may be, shall not permit any person who is or who appears to be under the influence of intoxicating liquor or drugs, to enter or remain at a workplace.

No person at a workplace shall be under the influence of or have in his possession or partake of or offer any other person intoxicating liquor or drugs.

An employer or user, as the case may be, shall in the case where a person is taking medicines, only allow such person to perform duties at the workplace if the side effects of such medicine do not institute a threat to the health or safety of the person concerned or other persons at such workplace.

27. HIV/AIDS MANAGEMENT

27.1. HIV/AIDS Policy

The Contractor shall submit to the Engineer a HIV/AIDS policy signed by the Chief executive of the Company.

The HIV/AIDS Policy shall address but not limited to the following:

- HIV prevention and precaution programme;
- Education and awareness programme;
- Statements on job access for applicants with HIV;
- Statement on job security of employees;
- Statement on HIV testing of employees and applicants;
- Confidentiality and or disclosure policy; and
- Statement on safety of co-workers.

27.2. HIV/AIDS Management Plan

The Contractor shall submit a HIV/AIDS management plan to the Engineer within 10 days of receiving a letter of appointment and before commencement of work.

PART B – SITE SPECFIFIC REQUIREMENTS

28. Laying of Pipes

Principal Contractor should ensure that the laying of pipes is executed safely.

- Pipe transportation from the construction site to the actual works site should be with a plant machinery that is road worthy and that is inspected to ensure that it is capable to carry such a load
- The temporary storage of pipes on the actual works site should be levelled and barricaded. The pipe should not be placed directly on the ground surface as that could pose an ergonomic hazard should the contractor use manual procedure.
- The trench bedding should be clear of any debris for at least 400mm from the trench
- If the contractor will be using manual method to lay pipes inside the trench , a suitable personal protective equipment should be provided to the employees however if the laying of pipes will be conducted by the machinery, ensure that a proper induction is conducted and the operator has the right competency.
- Any near miss, incident or accident that could occur during the laying of pipes, should be immediately recorded and the construction manager should alert the relevant stakeholders accordingly.

The contractor should in their she plan elaborate on how they plan to ensure that the laying of pipe will be conducted safety and submit method statement and safe work procedure on how this activity will be executed before they commence.

29. CONFINED SPACE ENTRY

- Enclosed space work necessitates a Confined Space Permit. This may only be obtained from the authorized person nominated in writing.
- The responsibility for safe procedure, both at the time of entry and during the entire operation of entering and working in confined spaces, rests with the Contractor.
- The Contractor shall be sure that adequate steps have been taken to eliminate or control hazards.
- Before working in an area that contains dust, the area is to be ventilated and hosed down to settle and dampen the dust.
- The Contractor shall provide all necessary equipment to manage confined spaces, including all necessary monitoring and rescue equipment (such as tripods, breathing equipment and the like).
- The Contractor shall ensure all persons working in a confined space or managing entry to a confined space are appropriately trained.
- Compulsory - Continuous monitoring, trained rescue teams, radio communication & adequate ventilation.

Pump sumps & valve chambers

Ventilation

- All available manholes or ventilation covers must be removed and the compartment ventilated for 10 (ten) to 15 (fifteen) minutes, using compressed air or a portable blower.
- Such ventilation must be continued while personnel are in the compartment.
- Ensure that exhaust fumes from blower do not enter the confined space.
- Before entering any sump or compartment, the atmosphere must be tested by the Principal Contractor's competent person (trained by the supplier of the gas monitoring equipment) by lowering the gas monitoring equipment to the bottom of the sump or compartment by means of a rope.
- A register must be kept indicating that the atmosphere has been tested and that the sump or compartment is fit to work in.
- The Principal Contractor's construction supervisor must check and co-sign this register each time he visits a site to ensure that the atmosphere is continuously being monitored.

Entering sump

- When entering a sump the person entering the sump must wear the safety harness, gas detector as well as a self-rescuer.
- A lifeline must be attached to the safety harness and a person on the surface must be in continuous contact with the person in the sump.
- At least one person on the surface must be trained in basic first aid and CPR and a first aid kit with resuscitation equipment must be available outside the entrance of the confined space for emergencies.
- Should the alarm sound when a person is in the confined space, the area must be evacuated immediately and the atmosphere re-tested and certified safe before re-entry into the confined space.
- In no circumstance shall any person remain within a sump for a period of more than one hour at a time.
- A five-minute rest on the surface must be taken after this period before re-entering.
- No naked lights, smoking or unprotected electrical apparatus which may cause sparks, shall be permitted in any sump or in their vicinity.

Underground tanks, digesters

Lock-out

- The electrical switch must be locked out in the MCC room when emptying and filling a digester.
- No work shall be done in any digester or closed tank without the necessary permit issued by the Maintenance Manager of the facility.
- The Principal Contractor's construction supervisor must check and co-sign the permit.

Ventilation

- All available manhole or ventilation covers, and in the case of a digester, the "Varig" (pressure relief) valve must be removed and the compartment force ventilated for at least 4 (four) hours.
- Such ventilation must be continued while there are people in the confined space.
- Before entering the confined space, the atmosphere must be tested by lowering the gas monitoring equipment to the bottom of the confined space by means of a rope.
- The compartment may only be entered if it has been certified safe by a competent person (certified competent by supplier of gas monitoring equipment).

- The first person to enter the confined space must wear the gas monitoring equipment on his person while inside the confined space.
- A person trained in the use thereof, inside the digester, must also wear an emergency oxygen kit. Another emergency oxygen kit must be available on the surface.
- No person may enter any digester or closed tank unaccompanied and at least two other persons must be present on the surface to make continuous contact with the persons in the confined space.

Entering closed tank or digester

- The first person to enter a closed tank or digester must wear a safety harness with a safety rope, long enough to reach the point of exit.
- This safety rope must be monitored at all times.
- All persons subsequently entering the closed tank/digester must wear a safety harness as well as a self-rescuer.
- No person is allowed to enter the tank or digester without a safety harness or self rescuer.
- In no circumstances shall any person remain within the enclosure for a period of more than one hour at a time.
- A fifteen-minute rest on the surface must be taken before re-entry,
- No naked lights, smoking or unprotected electrical apparatus which may cause sparks shall be permitted in any confined space or in their vicinity.

Confined spaces & water chambers

General

- All employees working in confined spaces or sewer manholes must be issued with gas monitoring equipment and safety harnesses and self- rescuers where applicable.
- All these employees must be trained in their use.
- Where over pumping between manholes is involved, only leakage free pumping machines and conveyance tubes will be allowed.
- Under no circumstances may any confined space be entered unless it has been certified safe to work in.
- Safety harnesses and attachments must be checked for damage to webbing, metal fittings and ropes on a monthly basis and the findings recorded in a register.
- Should a harness be damaged, it must be reported to the construction supervisor immediately.

The following records shall be taken and maintained by the Principal Contractor:

- Confined space entry permits
- Confined space entry registers
- Safety harness registers Ventilation
- All available manholes or ventilation covers must be removed and the chamber ventilated for 10 (ten) to 15 (fifteen) minutes, using compressed air or a portable blower.
- Such ventilation must be continued while personnel are in the chamber.
- Ensure that exhaust fumes from blower do not enter the confined space.
- Before entering any chamber, the atmosphere must be tested by the Principal Contractor's competent person (trained by the supplier of the gas monitoring equipment) by lowering the gas monitoring equipment to the bottom of the chamber by means of a rope.
- A register must be kept indicating that the atmosphere has been tested and that the area is fit to work in.
- The Principal Contractor's construction supervisor must check and co-sign this register every time he visits the site to ensure that the atmosphere is continuously being monitored.
- Fumes must be extracted from the chamber while welding. Entering chamber
- When entering a chamber the person entering the chamber must wear a safety harness as well as the gas detector.
- A lifeline must be attached to the safety harness and a person on the surface must be in continuous contact with the person in the manhole.
- At least one person on the surface must be trained in basic first aid and CPR and a first aid kit with resuscitation equipment must be available outside the entrance of the confined space for emergencies.
- In no circumstances shall any person remain within a chamber for a period of more than one hour at a time. A five-minute rest on the surface must be taken after this period before re-entering.
- Should the alarm sound when a person is in the confined space, the area must be evacuated immediately and the atmosphere re-tested and certified safe before re-entry into the confined space.
- When the activity to undertake inside the pipeline includes the use of any hazardous chemical substances or substances, which might cause hazardous fumes or gasses the contractor, must comply with 5.24 Hazardous Chemical Substances.

Safety equipment

- All teams must be issued with gas monitoring equipment and safety harnesses and self-rescuers where applicable.
- All employees must be trained in the use thereof.

30. BARRICADING

- Barricading plans are to be presented by the Principal Contractor for any major operations involving site works for approval by Sekkhukhune District Municipality Where areas are unsafe, they should be enclosed with barricading. Examples are people working overhead, welding splatter etc.
- Where there is a risk of injury, the area should be barricaded off with secure solid barricades.
- Barricading for the prevention of access into areas with a potential risk of injury shall as a minimum be constructed of a handrail, knee-rail and appropriately supported as to prevent any person from falling into the restricted/risk area.
- Appropriate signage shall be affixed to the barricade indicating the risk associated (i.e. deep excavation, lifting operations etc.) and the responsible Supervisor and contact details shall be displayed. All barricading shall have a “No Entry” signs on all sides and at each change of direction. Signage shall be placed at 20 m intervals where lengths exceed. All signage shall be a minimum size of 290 mm x 290 mm.
- Danger tape shall not be utilised to prevent personnel from entering into areas.
- Where no risk exists of injury to personnel such as stacking and storage areas, the use of wire for hand and knee rails netting shall be acceptable to demarcate the area.
- All barricades will have a dedicated entrance where it is required that personnel enter the areas.
- Appropriate signage shall be placed at the entrance indicating which Contractor has right of entry.
- It is the Contractor’s responsibility to remove all redundant barricades directly after use. The Contractor’s Safety Officers will maintain a marked-up site plan indicating where barricades are erected.

- It will be a requirement that the contractor protects employees against contact with exposed rebar and poles by the installation of rebar-caps on all exposed areas where there is a potential that an employee could be injured.

31. FALL PROTECTION

A pre-emptive Risk Assessment shall be required for any work carried out above two metres from the ground or any floor level and will be classified as “Work in Elevated Positions”.

As far as is practicable, any person working in an elevated position shall work from a platform, ladder or other device that is at least as safe as if he/she is working at ground level and whilst working in this position be wearing a single belt with lanyard that shall be worn to prevent the person falling from the platform, ladder or other device utilized. This safety belt shall be, as far as is possible, secured to a point away from the edge over which the person might fall and the lanyard shall be of such a length that the person will not be able to move over the edge.

Alternatively, any platform, slab, deck or surface forming an edge over which a person may fall may be fitted with guard rails at two different heights as prescribed in SANS 1085: Code of Practice for the Design, Erection, Use and Inspection of Access Scaffolding.

Where the above-mentioned requirement is not practicable, the person shall be provided with a full body harness that shall be worn and attached above the wearer’s head at all times and the lanyard must be fitted with a shock absorbing device. Only double lanyard fall arrest harnesses are permitted on site.

Where the above-mentioned requirements are not practicable, a suitable catch net shall be erected. Workers working in elevated positions shall be trained to use this safely and without risk to safety and health. Where work on roofs is carried out, the Risk Assessment shall take

into account the possibility of persons falling through fragile material, skylights and openings in the roof.

Where ladders are used – they are to be of good construction, sound material and adequate strength and suitable to the purpose for which it is used (e.g. electricians shall use suitable insulated ladders). Fitted with non-skid devices at the bottom of the stiles or with hooks or similar devices at the tops of the stiles.

Except for extension ladders, no ladder shall be used which is longer than 4,5m and no ladder shall have its reach extended by tying together two or more ladders. All ladders shall be inspected weekly and a log shall be kept of the inspections.

32. STRUCTURES

The Principal Contractor shall ensure that:

- All reasonably practicable steps are taken to prevent the uncontrolled collapse of any new or existing pipe work or structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying of construction work.
- No structure will be overloaded that it may become unsafe.
- He/she has received from the designer the following information:
- Information on known or anticipated hazards relating to the construction work and the relevant information required for the safe execution of the construction work.
- A geo-scientific report (where applicable).
- The loading the structure is designed to withstand.
- The methods and sequence of the construction process.
- Drawings will be kept on site and made available for inspection by an inspector, contractors, client, client's agent or employee.

33. TEMPORATY WORKS

- A contractor must appoint a temporary works designer in writing to design, inspect and approve the erected temporary works on site before use.
- A contractor must ensure that all temporary works operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose.
- A contractor must ensure that—
- all temporary works structures are adequately erected, supported, braced and maintained by a competent person so that they are capable of supporting all anticipated vertical and lateral loads that may be applied to them, and that no loads are imposed onto the structure that the structure is not designed to withstand;
- all temporary works structures are done with close reference to the structural design drawings, and where any uncertainty exists the structural designer should be consulted;
- detailed activity specific drawings pertaining to the design of temporary works structures are kept on the site and are available on request to an inspector, other contractors, the client, the client's agent or any employee;
- all persons required to erect, move or dismantle temporary works structures are provided with adequate training and instruction to perform those operations safely;
- all equipment used in temporary works structure are carefully examined and checked for suitability by a competent person, before being used;
- all temporary works structures are inspected by a competent person immediately before, during and after the placement of concrete, after inclement weather or any other imposed load and at least on a daily basis until the temporary works structure has been removed and the
- results have been recorded in a register and made available on site;
- no person may cast concrete, until authorization in writing has been given by the competent person contemplated in paragraph (a);

34. EXCAVATIONS

Hidden Hazards Penetration

In order to minimize the impact of hidden hazards when performing penetration or excavation activities the following process should be followed:

- a drawing review of the affected area,
- a site investigation,
- detection using instrumentation (as appropriate),
- the use of appropriate tools
- the use of PPE.

Workers engaging in excavation or penetration activities shall use tools, which are in good working condition and utilise PPE, electrically rated gloves and double insulated tools as appropriate.

To mitigate risk, the contractor shall ensure that adequate site investigation, utilising methods that would not penetrate hidden hazards (e.g. visual inspection, detection using instrumentation) is performed prior to any excavation or penetration activity. If hidden hazards cannot be identified through site investigation, the Client shall be notified prior to excavation or penetration activities and appropriate PPE shall be worn during the work activity.

Authorisation

Where excavations will exceed 1,5 m in depth, the Principal Contractor shall submit a Method Statement for approval before commencing with the excavation. Permission to proceed will only be granted once the Risk Assessment and Method Statement are approved.

The Principal Contractor shall ensure that all excavation work is carried out under the supervision of a competent person who has been appointed in writing.

The Principal Contractor shall evaluate, as far as is reasonably practicable, the stability of the ground before excavation work begins.

Every Principal Contractor / Subcontractor who performs excavation work shall:

- Take suitable and sufficient steps in order to prevent, as far as is reasonably practicable, any person from being buried or trapped by a fall or dislodgement of material in an excavation;
- Not require or permit any person to work in an excavation which has not been adequately shored or braced: Provided that shoring and bracing may not be necessary where:
- The sides of the excavation are sloped to at least the maximum angle of repose measured relative to the horizontal plane; or such an excavation is instable material:

  Provided that: -

a. Permission being given in writing by the appointed competent person contemplated in applicable *Construction Regulation* upon evaluation by him or her of the site conditions; and

b. Where any uncertainty pertaining to the stability of the soil still exists, the decision from a professional engineer or a professional technologist competent in excavations shall be decisive and such a decision shall be noted in writing and signed by both the competent person contemplated in the applicable *Construction Regulation* and the professional engineer or technologist, as the case may be;

- Take steps to ensure that the shoring or bracing contemplated in the above paragraph is designed and constructed in such a manner rendering it strong enough to support the sides of the excavation in question;

- Ensure that no load, material, plant or equipment is placed or moved near the edge of any excavation where it is likely to cause its collapse and thereby endangering the safety of, any person, unless precautions such as the revision of sufficient and suitable shoring or bracing are taken to prevent the sides from collapsing;

- Ensure that where the stability of an adjoining building, structure or road is likely to be affected by the making of an excavation, the steps are taken that may be necessary to ensure the stability of such building, structure or road and the safety of persons;

- Cause convenient and safe means of access to be provided to every excavation in which persons are required to work and such access shall not be further than 6m from the point where any worker within the excavation is working;

- Ascertain as far as is reasonably practicable the location and nature of electricity, water, gas or other similar services which may in any way be affected by the work to be performed, and shall before the commencement of excavation work that may affect any such service, take the steps that may be necessary to render the circumstances safe for all persons involved;

• Cause every excavation, including all bracing and shoring, to be inspected:

- daily, prior to each shift;
- after every blasting operation;
- after an unexpected fall of ground; • after substantial damage to supports; and
- after rain.

  by the competent person contemplated in sub regulation (1), in order to pronounce the safety of the excavation to ensure the safety of persons, and those results are to be recorded in a register kept on site and made available to an inspector, client, client's agent, contractor or employee upon request;
- Cause every excavation which is accessible to the public or which is adjacent to public roads or thoroughfares, or whereby the safety of persons may be endangered, to be:

- Adequately protected by a barrier or fence of at least one metre in height and as close to the excavation as is practicable; and
- Provided with warning illuminates or any other clearly visible boundary indicators at night or when visibility is poor

Upon entering an excavation, the requirements of General Safety Regulation 5 of the Act shall be observed:

35. STACKING AND STORAGE

The Principal Contractor must ensure that:

- A competent person is appointed in writing to supervise all stacking and storage on a construction site;
- Adequate storage areas are provided and demarcated;
- The storage areas are kept neat and under control;

- The base of any stack is level and capable of sustaining the weight exerted on it by the stack;
- The items in the lower layers can support the weight exerted by the top layers;
- Cartons and other containers that may become unstable due to wet conditions are kept dry;
- Pallets and containers are in good condition and no material is allowed to spill out;
- The height of any stack does not exceed 3 times the base unless stepped back at least half the depth of a single container at least every fifth tier or the approval of an inspector has been obtained to build the stacks higher with the aid of a machine. The operator of the machine must be protected against items falling from overhead off the stack and no items may overhang;
- The articles that make up a single tier are consistently of the same size, shape and mass;
- Structures for supporting stacks are structurally sound and able to support the mass of the stack;
- No articles are removed from the bottom of the stack first but from the top tier first;
- Anybody climbing onto a stack must do it in a safe manner, taking reasonable safety precautions, and ensuring that the stack is stable and capable of supporting him or her
- Stacks that are in danger of collapsing are broken down and restacked;
- Stability of stacks are not threatened by vehicles or other moving plant and machinery;
- Stacks are built in a header and stretcher fashion and that corners are securely bonded;
- Stacks are stepped back at least half the depth of a single container at least every fifth tier; and
- Persons climbing onto stacks do not approach unguarded moving machinery or electrical installations.
- Laydown area is allocated for Contractor-supplied items.
- At all times, the Contractor shall be responsible for the safe and adequate storage of all materials and equipment on site which he is to install, whether they are supplied by himself or others.
- The safe handling, unloading and loading of material receipts and dispatches at site or storage areas shall be the Contractors' responsibility.

The Contractor shall provide a suitable and adequate lock-up store for the storage of items of equipment and material, which would be damaged or pilfered if stored in the open. The Principal Contractor shall provide all facilities required for weather-proofing, dust proofing or vermin proofing.

The Contractor is responsible for the proper storage and maintenance of all equipment until issue of the Certificate of Practical Completion.

All equipment and materials will be stored on suitable wood poles or pallets which will not protrude more than a meter from any of the stored material. Safe access ways shall be maintained between all stored items preventing employees from having to climb over or under equipment to retrieve the necessary.

36. HOUSEKEEPING

The Principal Contractor / Contractor to ensure that:

- Housekeeping is continuously implemented;
- Materials & equipment are properly stored;
- Scrap, waste & debris are removed regularly;
- Materials placed for use are placed safely and not allowed to accumulate or cause obstruction to free flow of pedestrian and vehicular traffic;
- Waste & debris not to be removed by throwing from heights but by chute or crane;
- Construction sites in built-up areas, adjacent to a public way, are suitably and sufficiently fenced off and provided with controlled access points to prevent the entry of unauthorized persons;
- A catch platform or net is erected above an entrance or passageway or above a place where persons work or pass under, or fence off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that all persons are kept safe in the case of danger or possibility of persons being struck by falling objects.
- An unimpeded work space is maintained for every employee;
- Every workplace is kept clean, orderly and free of tools etc. that are not required for the work being done materials;
- As far as is practicable, every floor, walkway, stair, passage and gangway is kept in good state of repair, skid-free and free of obstruction, waste and materials;
- The walls and roof of every indoors workplace is sound and leak-free;
- Openings in floors, hatchways, stairways and open sides of floors or buildings are barricaded, fences, boarded over or provided with protection to prevent persons from falling.

37. DEMOLITION WORK

The Principal Contractor /Contractor shall ensure that they appoint a competent person in writing to supervise and control all demolition work on site.

The Contractor shall 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. During the demolition, a competent person shall check the structural integrity of the structure at intervals determined in the method statement contemplated in sub regulation (2), in order to avoid any premature collapses.

Every contractor who performs demolition work shall:
With regard to a structure being demolished, take steps to ensure that:

- No floor, roof or other part of the structure is overloaded with debris or material in a manner which would render it unsafe;
- All reasonably practicable precautions are taken to avoid the danger of the structure collapsing when any part of the framing of a framed or partly framed building is removed, or when reinforced concrete is cut; and
- Precautions are taken in the form of adequate shoring or such other means as may be necessary to prevent the accidental collapse of any part of the structure or adjoining structure;
- Not require or permit any person to work under overhanging material or structure, which has not been adequately supported, shored or braced;
- Where the stability of an adjoining building, structure or road is likely to be affected by demolition work on a structure, take such steps as may be necessary to ensure the stability of such structure or road and the safety of persons;
- Ascertain as far as is reasonably practicable the location and nature of electricity, water, gas or other similar services which may in anyway, be affected by the work to be performed, and shall before the commencement of demolition work that may affect any such service, take the steps that may be necessary to render circumstances safe for all persons involved;
- Cause every stairwell used and every floor where work is being performed in a building being demolished, to be adequately illuminated by either natural or artificial means;
- Cause convenient and safe means of access to be provided to every part of the demolition site in which persons are required to work; and
- Erect a catch platform or net above an entrance or passageway or above a place where persons work or pass under, or fence off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that all persons are kept safe where there is a danger or possibility of persons being struck by falling objects.

- The contractor shall ensure that no material is dropped to any point, which falls outside the exterior walls of the structure, unless the area is effectively protected.

Waste and debris shall not be disposed from a high place by a chute unless the chute:

- Is adequately constructed and rigidly fastened;
- If inclined at an angle of more than 45 degrees to the horizontal, is enclosed on its four sides;
- If of the open type, is inclined at an angle of less than 45 degrees to the horizontal;
- Where necessary, is fitted with a gate at the bottom end to control the flow of material; and
- Is discharged into a container or an enclosed area surrounded by barriers.

The contractor shall ensure that every chute used to dispose of rubble is designed in such a manner that rubble does not free-fall and that the chute is strong enough to withstand the force of the debris travelling along the chute.

The contractor shall ensure that equipment is not used on floors or working surfaces, unless such floors or surfaces are of sufficient strength to support the imposed loads.

Where the risk assessment indicates the presence of asbestos, the contractor shall ensure that all asbestos related work is conducted in accordance with the provisions of the Asbestos Regulations promulgated by Government Notice No. R.155 of 10 February 2002, as amended. Regulation 21:

- Demolition of asbestos may only be carried out by a registered (with the Department of Labour) Asbestos Contractor;
- All asbestos materials likely to become airborne must be identified;
- A Plan of Work must be submitted for approval to an Approved Asbestos Inspection Authority (AAIA) (approved by the Department of Labour) 30 days prior to commencement of demolishing work unless the Plan was drawn up by an AAIA and a signed (by all parties) copy must be submitted to the Department of Labour 14 days before commencement of the demolishing.

During Demolition Work:

- All asbestos containing material shall be disposed of safely.
- Employees shall be issued with appropriate PPE and the proper use thereof enforced.

- After the demolition has been completed the area/premises shall be thoroughly checked to ensure that all asbestos waste has been removed.
- No person is allowed to:
- Use compressed air or permit the use of compressed air to remove asbestos dust from any surface or person;
- Smoke, eat, drink or keep food or beverages in an area not specifically designated for this;
- Apply asbestos by spraying.

Where the risk assessment indicates the presence of lead, the contractor shall ensure that all lead related work is conducted in accordance with the provisions of the Lead Regulations promulgated by Government Notice No. R.236 of 28 February 2002, as amended.

Where the demolition work involves the use of explosives, a method statement is to be developed in accordance with the applicable explosives legislation, by an appointed person who is competent in the use of explosives for demolition work and the procedures therein are adhered to.

The contractor shall ensure that all waste and debris is as soon as reasonably practicable removed and disposed of from the site in accordance with the applicable legislation.

38. SPEED RESTRICTIONS, SIGNAGE AND PROTECTION

The Principal Contractor shall ensure that all persons in its employ, all Contractors, and all those that are visiting the site are aware and comply with the site speed restriction(s).

Separate vehicle and pedestrian access routes shall be provided, maintained, controlled, and enforced. Signage shall be provided and should comply as per OHS Act and the South African Road Traffic legislation with specific reference to Manual 13.

39. ACCESS SCAFFOLDING

Access Scaffolding shall be erected, used and maintained safely in accordance with Construction Regulation and SA Bureau of Standards Code of Practice, SANS 1085 entitled, “The Design, Erection, Use & Inspection of Access Scaffolding.

Every contractor using access scaffolding, shall ensure that such scaffolding, when used, complies with the safety standards incorporated for this purpose into these Regulations under section 44 of the Act.

Detailed consideration shall be given to all scaffolding to ensure that it is properly planned to meet the working requirements, designed to carry the necessary loadings and maintained in a sound condition. It shall also be ensured that there is sufficient material available to erect the scaffolding properly.

The contractor shall ensure that all scaffolding work operations are carried out under the supervision of a competent person who has been appointed in writing and that all scaffold erectors, team leaders and inspectors are competent to carry out their work.

The Contractor shall ensure that all contractors that erect scaffolding are in compliance to SANS 10085-1 and have on site a copy of SANS 10085-1 as amended.

- The Contractor shall ensure that all contractors that make use of scaffolding have on site a copy of SANS 10085-1 as amended.
- The Contractor shall ensure that all contractors ensure that all scaffolding is in compliance to SANS 1008-1.

NB The Contractor shall ensure that a notice board containing the names and contact details of their Scaffolding erectors and scaffolding inspectors are clearly displayed and securely fixed to their scaffolding.

40. PLANT AND MACHINERY

39.1. Construction Vehicles & Mobile Plant

"Construction Plant" includes all types of plant including but not limited to, fixtures, fittings, implements, equipment, tools and appliances, and also anything which is used for any purpose in connection with such plant cranes, piling rigs, excavators, road vehicles, and all lifting equipment etc.

The Principal Contractor shall ensure that all such plant complies with the requirements of the OHS Act 85/1993, Driven Machinery Regulations and Construction Regulations (February 2014). The Principal Contractor and all relevant contractors shall inspect and keep records of inspections of the construction plant used on site. Only authorized/competent persons are to use machinery under proper supervision. Appropriate PPE and Clothing must be provided and maintained in good condition at all times. No unsafe or dangerous machinery, equipment, plant or tools may be brought onto, allowed or used on the construction site.

Construction Vehicles and Mobile Plant shall be inspected by a competent person prior to being allowed on a project site and suppliers of hired vehicles, plant and equipment will be required to comply with this specification as well as the Act and Regulations.

Bulk Mixing Plants

The Principal Contractor / Contractor shall erect, operate and maintain Bulk Mixing Plants in accordance with the requirements of Construction Regulation 20.

Explosive Powered Tools (EPT)

No contractor shall use or permit any person to use an explosive powered tool, unless—

a) It is provided with a protective guard around the muzzle end, which effectively confines any flying fragments or particles; and

b) The firing mechanism is so designed that the explosive powered tool will not function unless—

- It is held against the surface with a force of at least twice its weight; and
- The angle of inclination of the barrel to the work surface is not more than 15 degrees from a right angle

- Provided that the provisions of this sub regulation shall not apply to explosive powered tools in which the energy of the cartridge is transmitted to the bolts, nails or similar relevant objects by means of an intermediate piston which has a limited distance of travel.

The Contractor or user shall ensure that:

- Only cartridges suited for the explosive powered tool and the work to be performed are used;
- The explosive powered tool is cleaned and examined daily before use and as often as may be necessary for its safe operation by a competent person who has been appointed;
- That the safety devices are in proper working order prior to use;
- When not in use, the explosive powered tool and the cartridges are locked up in a safe place, which is inaccessible to unauthorised persons;
- The explosive powered tool is not stored in a loaded condition;
- A warning notice is displayed in a conspicuous manner wherever the explosive powered tool is used;
- The issuing and collection of cartridges and nails or studs is—
- Controlled and done in writing by a person having been appointed in writing; and
- Recorded in a register and that the recipient has accordingly signed for the receipt thereof as well as the returning of any spent and unspent cartridges.

- No contractor shall permit or require any person to use an explosive powered tool unless such person has been—
- Provided with and uses suitable protective equipment; and
- Trained in the operation, maintenance and use of such a tool.

Fire Extinguishers and Fire Fighting Equipment

The Principal Contractor and relevant Contractors must ensure all appropriate measures are taken to avoid the risk of fire shall provide adequate, regularly serviced firefighting equipment located at strategic points on site, specific to the classes of fire likely to occur. The appropriate notices and signs must be posted up as required. the fire equipment contemplated in previous paragraph is inspected by a competent person, who has been appointed in writing for that purpose, in the manner indicated by the manufacturer thereof and a sufficient number of workers are trained in the use of fire-extinguishing equipment.

Hired Plant and machinery

The Principal Contractor shall ensure that any hired plant and machinery used on site is safe for use. The necessary requirements as stipulated by the OHS Act 85/1993 and Construction Regulations (February 2014) shall apply. The Principal Contractor shall ensure that operators hired with machinery are competent and that certificates are kept on site in the health & safety file. All relevant Contractors must ensure the same.

Lifting Machines and Tackle (where and if required)

The Principal Contractor and all Contractors shall ensure that lifting machinery and tackle is inspected before use and thereafter in accordance with the Driven Machinery Regulations and the Construction Regulations (section 20). A competent lifting machinery and tackle inspector need to be appointed in writing and must inspect the equipment daily or before use, taking into account that:

- All lifting machinery and tackle have a safe working load clearly indicated;
- Regular inspection and servicing are carried out;
- Records are kept of inspections and of service certificates;
- There is a proper supervision in terms of guiding the loads that includes a trained banksman to direct lifting operations and check lifting tackle;
- The tower crane bases have been approved by an engineer;
- The operators are competent as well as physically and psychologically fit to work and in possession of a medical certificate of fitness to be available on site.

General Machinery

The principal Contractor and relevant Contractors shall ensure compliance with the Driven Machinery Regulations, which include inspecting machinery regularly, appointing a competent person to inspect and ensure maintenance, issuing PPE or clothing, and training those who use machinery.

Electrical Installations and Works

Electrical installation work (by definition: "installation work" means

(a) the installation, extension, modification or repair of an electrical installation;

(b) the connection of machinery at the supply terminals of such machinery; or *(e)* the inspection, testing and verification of electrical installations for the purpose of issuing a certificate of compliance;

shall be carried out by competent persons, and controlled by a competent person (Registered Person) that has been appointed to do so in writing, in accordance with Electrical Installation Regulations and the Electrical Machinery Regulations.

Temporary electrical installations shall be inspected at least once per week by a competent person and a record of the inspections kept in the Occupational Health & Safety File.

The Contractor shall ensure that:

- existing electrical services are located and marked before construction commences and during the progress thereof. Where this is not possible, workers with jackhammers etc. are to be protected against electric shock by the use of suitable protective equipment like insulated handles, rubber mats etc.
- electrical installations and -machinery are sufficiently robust to withstand working conditions on site.
- all electrical machinery used on site is inspected before start-up on a daily basis by a competent person and that a record of the inspection is kept in the Occupational Health & Safety File.

A system of control shall be established in order that no unauthorized person can energize a circuit, open a valve, or activate a machine on which people are working or doing maintenance, even if equipment, plant or machinery is out of commission for any period, thus eliminating injuries and damage to people and equipment as far as is reasonably practicable.

Physical/mechanical lock-out systems shall be part of the safety system and included in training. Lockouts shall be tagged and the system tested before commencing with any work or repairs. This lock-out procedure shall be adhered to by all Contractors on site.

41. HAZARDOUS CHEMICAL AGENTS(HCA)

The Principal Contractor and other relevant Contractors shall provide the necessary training and information regarding the use, transport, and storage of HCA. The Principal Contractor shall ensure that the use, transport, and storage of HCA are carried out as prescribed by the HCA Regulations. The Contractor shall ensure that all hazardous chemicals on site have a safety Data Sheet (SDS) on site and the users are made aware of the hazards and precautions that need to be taken when using the chemicals. The First Aiders must be made aware of the SDS and how to treat HCA incidents appropriately.

42. USE & STORAGE OF FLAMMABLES

The contractor shall ensure that—

- Where flammable liquids are being used, applied or stored at the workplace concerned, this is done in such a manner which would cause no fire or explosion hazard, and that the workplace is effectively ventilated: Provided that where the workplace cannot effectively be ventilated.
- Every employee involved is provided with a respirator, mask or breathing apparatus of a type approved by the chief inspector, and Steps are taken to ensure that every such employee, while using or applying flammable liquid, uses the apparatus supplied to him or her;
- No person smokes in any place in which flammable liquid is used or stored, and such contractor shall affix a suitable and conspicuous notice at all entrances to any such areas prohibiting such smoking;
- Flammable liquids on a construction site is stored in a well-ventilated reasonably fireresistant container, cage or room and kept locked with proper access control measures in place;
- An adequate amount of efficient fire-fighting equipment is installed in suitable locations around the flammable liquids store with the recognized symbolic signs;
- Only the quantity of flammable liquid needed for work on one day is to be taken out of the store for use;
- All containers holding flammable liquids are kept tightly closed when not in actual use and, after their contents have been used up, to be removed from the construction site and safely disposed of;

- Where flammable liquids are decanted, the metal containers are bonded or earthed; and
- No flammable material such as cotton waste, paper, cleaning rags or similar material is stored together with flammable liquids.
- Stored in a locked well-ventilated reasonably fire-resistant container, cage or room conspicuously demarcated as “Flammable Store – No Smoking or Naked Lights”;
- the flammables store to be constructed of two-hour fire-retardant walls and roof and separated from adjoining rooms or workplaces by means of a two-hour fire-retardant fire wall;
- All electrical switches and fittings to be of a flameproof design;
- Any work done with tools in a flammables store or work areas to be of a non-sparking nature;
- The flammable store to be designed and constructed to, in the event of spillage of liquids in the store, to contain the full quantity + 10% of the liquids stored;
- A sign indicating the capacity of the store to be displayed on the door;
- Containers (including empty containers) to be kept closed to prevent fumes/vapours from escaping and accumulating in low lying areas;
- Welding and other flammable gases to be stored segregated as to type of gas and empty and full cylinders.

43. ENVIRONMENTAL

All Construction debris/rubble is to be stored in a skip.

In the event of large demolition or excavation work and where this is not possible, debris/rubble is to be stored in a safe manner, to prevent any form of injury to personnel or equipment.

When transporting rubble to a landfill site, reasonable care is to be taken to ensure that spillage of rubble from such skip or truck is avoided.

Timber, brick-work, dry walling, non-asbestos insulation, clean concrete, and similar debris shall be transported to a landfill, authorized to receive such waste. Reasonable effort shall be made to separate recoverable metals from construction debris.

Personnel waste such as papers and food containers should be bagged, removed from the site, and properly disposed of by the Contractor.

Fluorescent, sodium, mercury vapour and incandescent light bulbs shall be removed from light fixtures and managed as Chemical waste. These items shall be boxed and then labelled to identify the contents.

Equipment containing oil or other petroleum products shall be drained of oil, and managed as residue material. Drained oil shall be managed as chemical waste.

44. Project Close Out

Upon completion of the project, the contractor is required to hand over a consolidated project file to the Client with all the working documents for retention.

PART C4 SITE INFORMATION

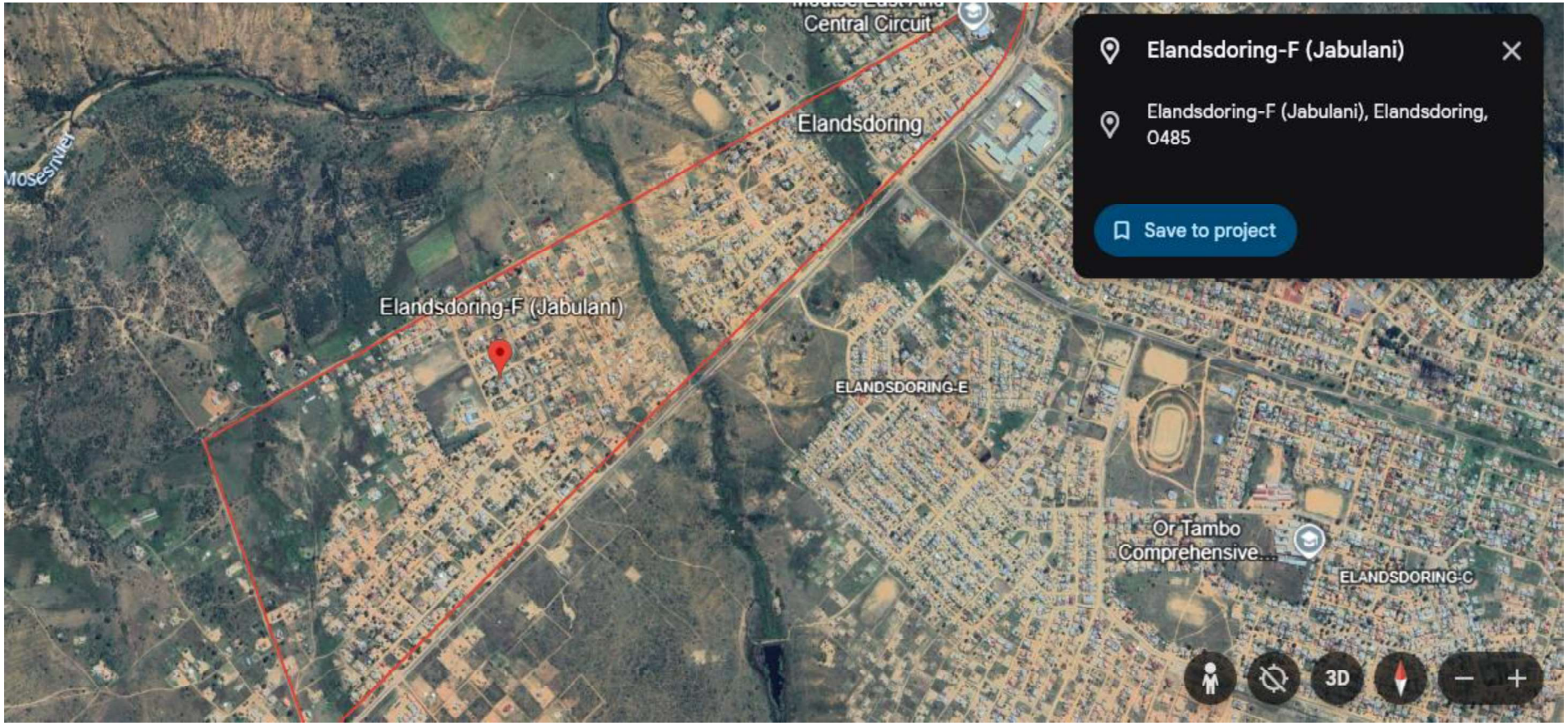
SECTION CONTENTS

C4.1 Locality Plan 357

C4.1 Locality Plan

The site coordinates are as follows:

Latitude : 29^{0}07’39’’ E
Longitude : 25^{0}15’29’’ S



PART C5 ANNEXURES

(For Information Purposes Only)

SECTION CONTENTS

Annexure A Abstracts of the Mine Health and Safety Act No. 29 of 1996 and Amendment Act No. 72 of 1997

Annexure A **Abstracts of the Mine Health and Safety Act No. 29 of 1996 and Amendment Act No. 72 of 1997**

DEFINITIONS:

Section 102 of the Mine Health and Safety Act refers.

"mine" means, when –

(a) "used as a noun-

(i) any borehole, or excavation, in any tailing or in the earth, including the portion of the earth that is under the sea or other water, made for the purpose of searching for or winning a mineral, whether is being worked or not, or

(ii) any other place where a mineral deposit is being exploited, including the mining area and all buildings, structures, machinery, mine dumps, access roads or objects situated on or in that area that are used or intended to be used in connection with searching, winning, exploiting or processing of a mineral, or for health and safety purposes. But, if two or more excavations, boreholes or places are being worked in conjunction with one another

(iii) a works; and

(b) used as a verb, the making of any excavation or borehole referred to in paragraph (a) (i), or the exploitation of any mineral deposit in any other manner, for the purpose of winning a mineral including prospecting in connection with the winning of a mineral.

(a) whether that substance is in solid, liquid or gaseous form;

(b) that occurs naturally in or on the earth, in or under water or in tailings, and

(c) that has been formed by or subjected to a geological process.

"processing" means the recovering, extracting, concentrating, refining, calcimining, classifying, crushing, milling, screening, washing, reduction, smelting or gasification or any mineral, and "process" has a similar meaning

"works" means any place, excluding a mine, where any person carries out-

(a) The transmitting and distributing to another consumer of any form of power from a mine, by the owner thereof, to the terminal point of bulk, to the power supply meter on any such other consumer's premises, or

(b) Training at any central rescue station, or

(c) The making, repairing, re-opening or closing of any subterranean tunnel, or

(d) Any operations necessary in connection with any of the operational listed in this paragraph.

EXAMPLE FOR USE BY CONTRACTOR WHEN APPOINTING SUB-ORDINATES IN TERMS OF THE MINE HEALTH AND SAFETY ACT (1996) AS AMENDED.
(To printed on Contractors letter head)

APPOINTMENT IN TERMS OF SUB-ORDINATE MANAGER: REGULATION 2.6.1 IN FORCE IN TERMS OF SCHEDULE 4 OF THE MINE HEALTH AND SAFETY ACT (ACT NO. 29 OF 1996) AS AMENDED BY THE HEALTH SAFETY AMENDMENT ACT (ACT NO. 72 OF 1997)

I, ... in my capacity as **Commercial Manager**, having been appointed in terms of **Section 3(1)** of the Act (as amended), by the Deputy Director General who is our client, Sekhukhune District Municipality and owner of the Mine(s) to be worked under the requirements of the above mentioned Acts hereby, in terms of **Regulation 2.6.1** of the Act as amended, appoint ..... as Sub-Ordinate Manager of the Contractor, ... of address, ... and contact number, ... on contract no SK8/3/1-22/2024/25 **FOR CONSTRUCTION OF MOUTSE EAST AND WEST WATER RETICULATION PHASE 2: ELOKHISHINI, PHOOKO AND PHOOKWANE CONTRACT 2D**

In accordance with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996), you are also appointed in terms of Section 7(2) of the Mine Health and Safety Act, 1996 to perform the following functions, assigned to the Mine Manager in terms of Section 7(1), 10(2) (b) and (c) and 11 (1) in so far as your area of responsibilities are concerned:-

1. You must identify the hazards, assess the risk and record the hazards to health and safety to which employees may be exposed while they are at work, and

2. To the extent that is reasonable, you must ensure that every employee is properly trained:

   a. In the measures necessary to eliminate, control and minimise those risks to health and safety.
   b. In the procedures to be followed to perform the employee's work.

3. To the extent that is reasonably practical, you must:

   Ensure that every employee becomes familiar with the work-related hazards and risk and the measures that must be taken to eliminate, control and minimise those hazards and risks.

4. To the extent that is reasonably practical, you must:

   Ensure that every employee under your control complies with the requirements of the Act.

   Institutes the measures necessary to secure, maintain and enhance health and safety.

   Considers and employees training and capabilities in respect of health and safety before assigning a task to that employee.

   Ensure that work is performed under the general supervision of a person trained to understand the hazards associated with the work, and who has the authority to ensure that the precautionary measures laid down by the Manager are implemented.

   You will be responsible for the control, management and direction of all the activities and employees connected with work and you are required to ensure that all such activities take place in accordance with the provisions of the Mine Health and Safety Act and the Regulations are complied with.

You are further required to inform the Manager, …… as soon as practicable, of any breach of any provision of these Regulation, to enable him to inform the Principal Inspector of Mines, Department of Minerals and Energy, or take such steps as may be necessary.

Please acquaint yourself with the relevant Regulations, Standards and Procedures, which have a bearing on your appointment. You must ensure that you are fully conversant with the requirements of the Procedures for Reporting Accidents.

SIGNED: .....

DATE: .....

WITNESS: 1. ..... 2.....

NAME(Print): 1. ..... 2.....

I, ..., having been appointed in terms of Regulation 2.6.1 of the act (as amended) to perform all functions entrusted to .....
In terms of the Act (as amended) hereby accept the above appointment.

SIGNED: .....

DATE: .....

WITNESS: 1. ..... 2.....

NAME(Print): 1. ..... 2.....

EXAMPLE FOR USE BY CONTRACTOR WHEN APPOINTING SUB-ORDINATES IN TERMS OF THE MINE HEALTH AND SAFETY ACT (1996) AS AMENDED.
(To printed on Contractors letter head)

APPOINTMENT OF RESPONSIBLE MINE SURVEYOR / COMPETENT PERSON: REGULATION 2.12.2 AND 2.12.6 IN FORCE IN TERMS OF SCHEDULE 4 OF THE MINE HEALTH AND SAFETY ACT, (ACT NO.29 OF 1996) AS AMENDED BY THE HEALTH AND SAFETY AMENDMENT ACT (ACT NO. 72 OF 1997)

I, ...in my capacity as Commercial Manager, having been appointed in terms of Section 3(1) of the Act (as amended), by the Deputy Director General, who is our client, 'Sekhukhune District Municipality and owner of the Mine(s) to be worked under the requirements of the above mentioned Acts hereby, in terms of Regulations 2.12.2 and 2.12.6 of the Act as amended, appoint ..... as Competent Person responsible for mine survey for the Contractor, ... of address ..... and contact number, ... on all contracts in Limpopo that are undertaken by the Contractor.

Please confirm this appointment by signing at the bottom.

SIGNED: ..... DATE:.....

NAME:.....

SIGNED: ..... DATE:.....

NAME:.....

SDM:	Witness 1:	Witness 2:	Tenderer:	Witness 1:	Witness 2:

EXAMPLE FOR USE BY CONTRACTOR WHEN APPOINTING SUB-ORDINATES IN TERMS OF THE MINE HEALTH AND SAFETY ACT (1996) AS AMENDED.
(To printed on Contractors letter head)

APPOINTMENT AS COMPETENT PERSON IN CHARGE OF MACHINERY IN TERMS OF REGULATION 2.13.2 IN FORCE IN TERMS OF SCHEDULE 4 OF THE MINE HEALTH AND SAFETY ACT (ACT NO. 29 OF 1996) AS AMENDED BY THE HEALTH AND SAFETY AMENDMENT ACT (ACT NO. 72 OF 1997)

I, ... in my capacity as **Commercial Manager**, having been appointed in terms of **Section 3(1)** of the Act (as amended), by the Deputy Director General, who is our client, 'Sekhukhune District Municipality and owner of the Mine(s) to be worked under the requirements of the above mentioned Acts hereby, in terms of **Regulations 2.13.2** of the Act as amended, appoint ..... as Competent Person in charge of machinery for the Contractor, ... of address ..... and contact number, ... on all contracts in Limpopo that are undertaken by the Contractor.

You are to report any accident to the mine manager immediately and personally visit the scene of the accident without delay.

You must familiarise yourself with the Mine Health and Safety Act and the Minerals Act and the Regulations and ensure that you have a copy in your possession and you must take all reasonable measures to ensure that the provisions of this Act are complied with.

Your attention is further drawn to Regulation 2.13.4.1 as well as the requirements of Chapter 18,20 and 21.

Please confirm this appointment by signing at the bottom.

SIGNED: ..... DATE:.....

NAME:.....

SIGNED: ..... DATE:.....

NAME:.....

SEKHUKHUNE
District Municipality
Private Bag X8611 Groblersdal 0470, 3 West Street Groblersdal 0470
Tel : (013) 262 7300, Fax: (013) 262 3688
E-Mail : sekinfo@sekhukhune.co.za

BID NUMBER: SK8/3/1-19/2024/25

CONSTRUCTION OF MOUTSE EAST AND WEST WATER RETICULATION PHASE 2: PHOOKO, PHOOKWANE AND ELOKHISHIN EXT. CONTRACT 2D DRAWINGS

CLIENT:

SEKHUKHUNE DISTRICT MUNICIPALITY
3 West Street
GROBLERSDAL
0470

PROFFESSIONAL SERVICE PROVIDER:

RENDEALS FOUR CONSULTING
PLOT 46
TWEEFONTEIN
POLOKWANE
0700

2. SPECIFIC WATER REQUIREMENTS

2.1. For standard details refer to Johannesburg Water standard drawings **DWG 1, 2, 3, & 4**.

2.2. Protection of fittings and mains;

2.2.1. Steel mains: Copon lined and suitably wrapped per specification.

2.2.2. Steel fittings: Copon coated internally and suitably wrapped per specification.

2.2.3. Galvanised fittings: suitably wrapped per specification.

2.3. All valve and below ground hydrant chambers to be watertight.

2.4. Position of across the road erf connections to be marked by a **W** cut into the kerbstone.

2.5. The contractor shall not operate any water valve or other fittings without the permission of Johannesburg Water (Pty) Ltd.

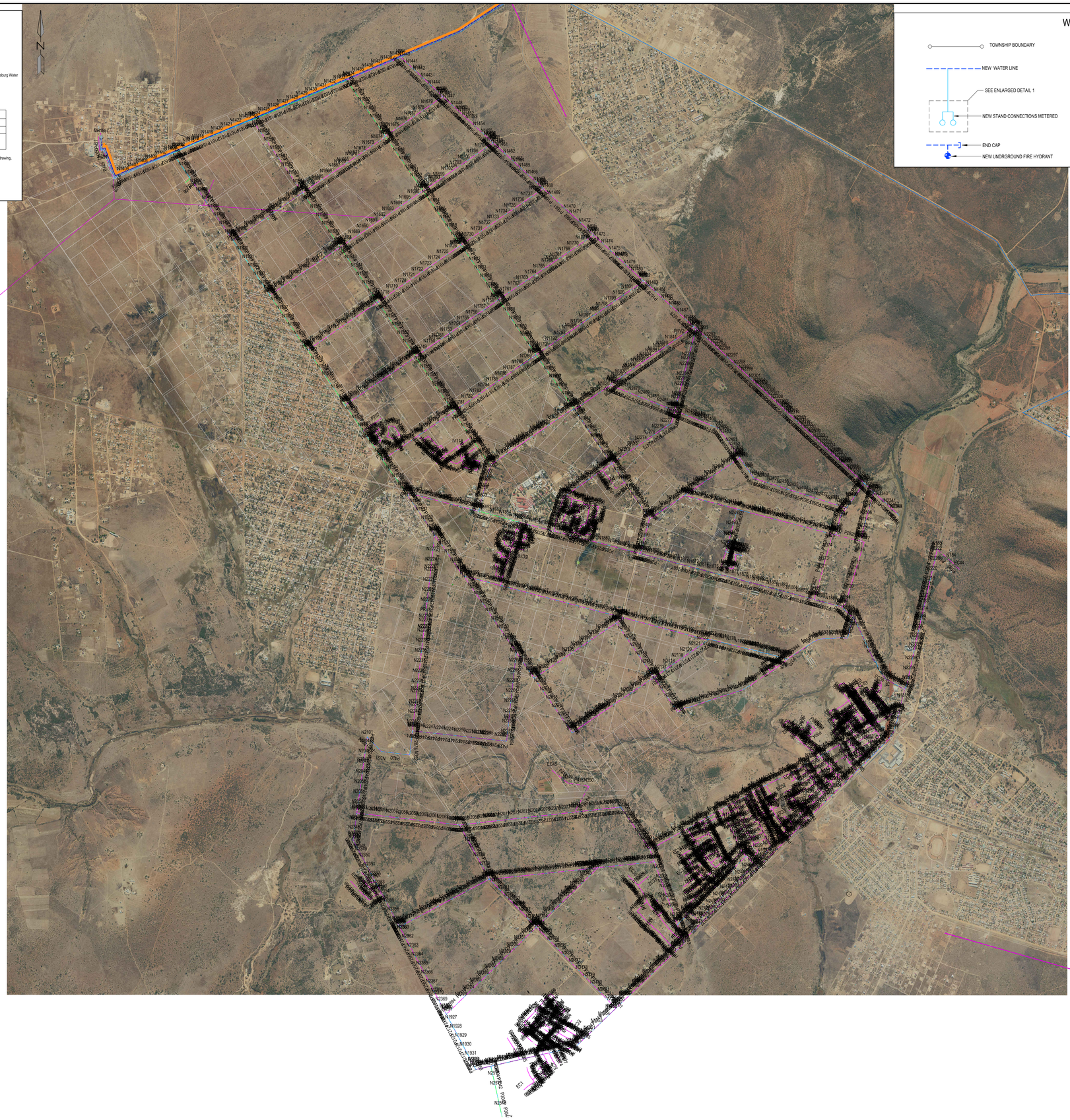
2.6. Cover to water mains;

The depths listed are depths to final ground level **inclusive** of **any landscaping** undertaken on the site.

	Minimum (mm)	Maximum (mm)
Gravel Road	1000	1500
Tarred roads and traffic areas	800	1500
Pedestrian areas and other areas		
no used by vehicular traffic	600	1500

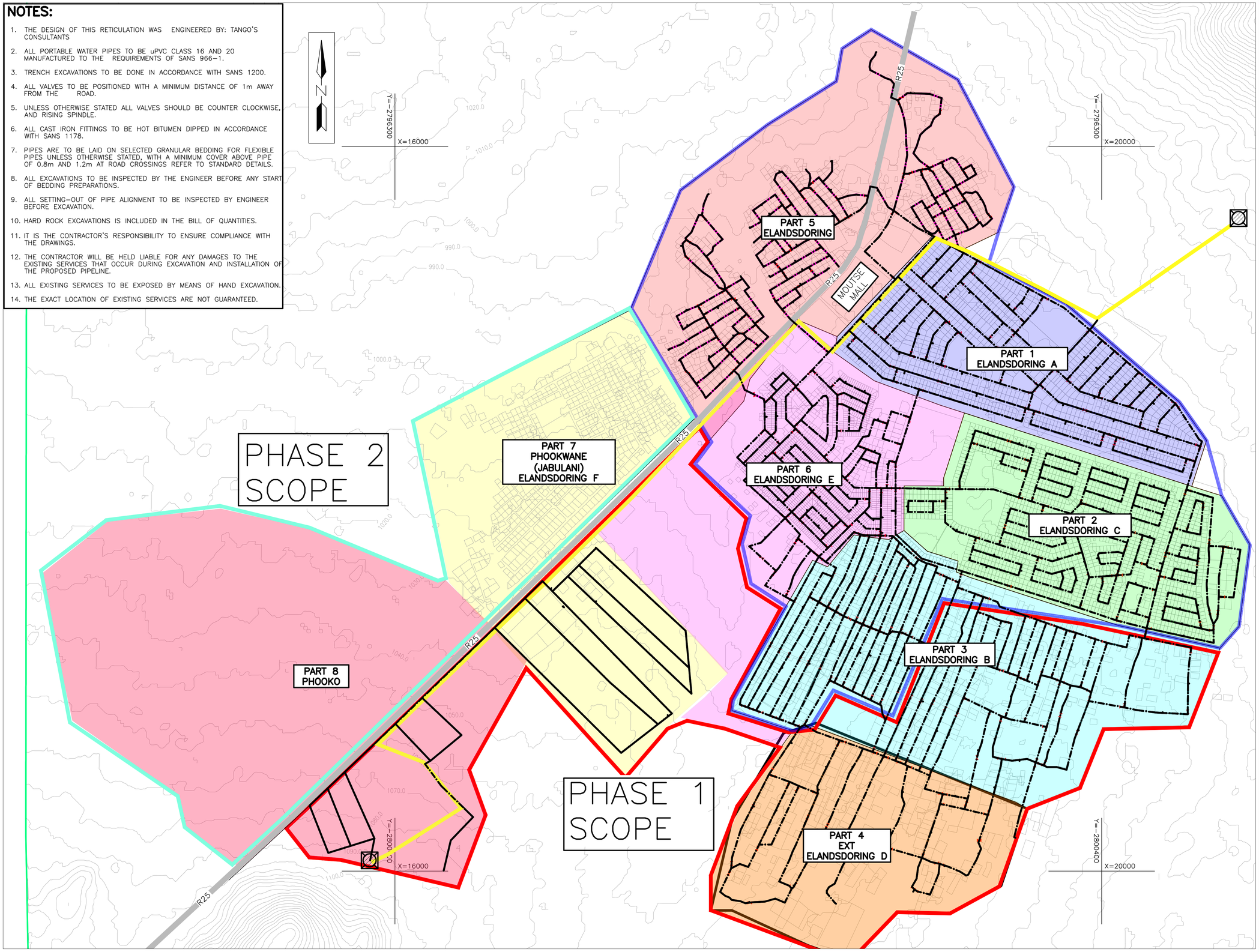
2.7. All water mains are to be installed at 2 meters from erf boundaries unless otherwise shown on the drawing.

2.8. Any anchor blocks constructed are to properly shuttered and cast against undisturbed ground. Any over excavation is to be filled with mass concrete.



NOTES:

1. THE DESIGN OF THIS RETICULATION WAS ENGINEERED BY: TANGO'S CONSULTANTS
2. ALL PORTABLE WATER PIPES TO BE uPVC CLASS 16 AND 20 MANUFACTURED TO THE REQUIREMENTS OF SANS 966–1.
3. TRENCH EXCAVATIONS TO BE DONE IN ACCORDANCE WITH SANS 1200.
4. ALL VALVES TO BE POSITIONED WITH A MINIMUM DISTANCE OF 1m AWAY FROM THE ROAD.
5. UNLESS OTHERWISE STATED ALL VALVES SHOULD BE COUNTER CLOCKWISE, AND RISING SPINDLE.
6. ALL CAST IRON FITTINGS TO BE HOT BITUMEN DIPPED IN ACCORDANCE WITH SANS 1178.
7. PIPES ARE TO BE LAID ON SELECTED GRANULAR BEDDING FOR FLEXIBLE PIPES UNLESS OTHERWISE STATED, WITH A MINIMUM COVER ABOVE PIPE OF 0.8m AND 1.2m AT ROAD CROSSINGS REFER TO STANDARD DETAILS.
8. ALL EXCAVATIONS TO BE INSPECTED BY THE ENGINEER BEFORE ANY START OF BEDDING PREPARATIONS.
9. ALL SETTING–OUT OF PIPE ALIGNMENT TO BE INSPECTED BY ENGINEER BEFORE EXCAVATION.
10. HARD ROCK EXCAVATIONS IS INCLUDED IN THE BILL OF QUANTITIES.
11. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE COMPLIANCE WITH THE DRAWINGS.
12. THE CONTRACTOR WILL BE HELD LIABLE FOR ANY DAMAGES TO THE EXISTING SERVICES THAT OCCUR DURING EXCAVATION AND INSTALLATION OF THE PROPOSED PIPELINE.
13. ALL EXISTING SERVICES TO BE EXPOSED BY MEANS OF HAND EXCAVATION.
14. THE EXACT LOCATION OF EXISTING SERVICES ARE NOT GUARANTEED.



ELOKHISHINI KEY PLAN

SCALE 1:10 000

SCALE 1:10 000 0 100 200 300 400 500 1 000 2 000m

LEGEND:

- ELANDSDORING PROPOSED SUPPLY LINE
- PROPOSED RETICULATION PN 9
- INITIAL SCOPE (2012)
- REVISED SCOPE (2020)
- PHASE 2 SCOPE (2024)
- R25 MAIN ROAD
- ELOKHISHINI PART 1
- ELOKHISHINI PART 2
- ELOKHISHINI PART 3
- ELOKHISHINI PART 4
- ELOKHISHINI PART 5
- ELOKHISHINI PART 6
- ELOKHISHINI PART 7
- ELOKHISHINI PART 8
- CONTOUR LINE
- ERF BOUNDARY
- WEDGE GATE VALVE
- FIRE HYDRANT
- NODES
- PROPOSED ELEVATED TANK

Revisions

No.	Date	Description	By	Chk	App
A	08/08/24	DETAIL DESIGN REPORT	LP	KJM	NS

Reference

Drg No.	Description
C1401–086	TO ELOKHISHINI LAYOUT PLAN
C1401–080	FROM ELOKHISHINI LAYOUT PLAN

Designed	Drawn	Checked	Approved	Date	Scale
F.B	LP	K.J.M	N.S	08/08/24	AS SHOWN

Client:
SEKHUKHUNE DISTRICT MUNICIPALITY
PRIVATE BAGE X8611
GROBLERSDALE
0470
PHONE: (013) 262 7600

Project:
MOUTSE EAST AND WEST VILLAGES RETICULATION SYSTEMS

Drawing Title:
ELOKHISHINI RETICULATION KEY PLAN

Consultant:
rendeals four consulting
44 Gladiator Street
Rhodesfield, Kempton Park
P.O Box 2106< Johannesburg 2000
Tel. No. 011 394 5009
Fax No. 011 394 5068

Size	Project No.	Drawing No.	Sheet No.	Revision
A1	C1401–007		1 OF 1	A

2. SPECIFIC WATER REQUIREMENTS

2.1. For standard details refer to Johannesburg Water standard drawings **DWG 1, 2, 3, & 4**.
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2.4. Position of across the road erf connections to be marked by a **W** cut into the kerbstone.
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2.6. Cover to water mains;

The depths listed are depths to final ground level **inclusive** of **any landscaping** undertaken on the site.

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Pedestrian areas and other areas		
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2.8. Any anchor blocks constructed are to properly shuttered and cast against undisturbed ground. Any over excavation is to be filled with mass concrete.

TABLE 1

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P1	1094.654	1094.588	6.378	1.023%	75mm Class 9
P2	1110.784	1111.274	26.445	-1.850%	75mm Class 9
P3	1100.781	1101.239	27.598	-1.657%	75mm Class 9
P4	1101.239	1101.197	3.980	1.061%	75mm Class 9
P5	1111.234	1111.501	14.811	-1.798%	160mm Class 9
P6	1106.327	1106.077	8.652	2.871%	160mm Class 9
P7	1095.970	1096.358	15.532	-2.497%	75mm Class 9
P8	1096.904	1097.760	28.234	-3.032%	75mm Class 9
P9	1105.668	1105.026	15.463	4.145%	160mm Class 9
P10	1089.170	1089.093	13.367	0.576%	160mm Class 9
P11	1099.450	1100.015	19.897	-2.835%	75mm Class 9
P12	1100.406	1101.081	19.537	-3.450%	75mm Class 9
P13	1089.093	1088.995	14.852	0.659%	160mm Class 9
P14	1082.566	1082.488	13.289	0.586%	160mm Class 9
P15	1076.152	1076.468	21.771	-1.453%	75mm Class 9
P16	1076.655	1076.965	10.573	-2.918%	75mm Class 9
P17	1082.488	1082.385	20.995	0.498%	160mm Class 9
P18	1077.531	1077.658	22.120	-0.577%	160mm Class 9
P19	1052.925	1053.213	21.145	-1.360%	75mm Class 9
P20	1053.324	1053.579	16.488	-1.546%	75mm Class 9

TABLE 2

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P21	1077.658	1077.665	15.415	-0.046%	160mm Class 9
P22	1068.941	1068.880	9.565	0.635%	160mm Class 9
P23	1063.074	1063.697	4.770	-0.470%	160mm Class 9
P24	1099.962	1100.781	24.392	-3.355%	160mm Class 9
P25	1080.544	1080.776	11.030	-2.103%	75mm Class 9
P26	1100.781	1100.776	11.800	0.047%	160mm Class 9
P27	1095.743	1095.970	17.282	-1.307%	160mm Class 9
P28	1080.165	1080.255	13.111	-0.685%	75mm Class 9
P29	1095.970	1096.266	21.766	-1.359%	160mm Class 9
P30	1099.711	1099.450	17.403	1.499%	160mm Class 9
P31	1067.691	1068.120	17.118	-2.503%	75mm Class 9
P32	1099.450	1098.887	28.235	1.991%	160mm Class 9
P33	1076.638	1076.152	11.938	4.064%	160mm Class 9
P34	1057.169	1057.814	18.516	-3.478%	75mm Class 9
P35	1076.152	1075.549	16.212	3.710%	160mm Class 9
P36	1053.806	1052.925	17.676	4.980%	160mm Class 9
P37	1047.988	1048.221	10.611	-2.194%	75mm Class 9
P38	1051.055	1051.117	17.365	-0.356%	75mm Class 9
P39	1051.117	1050.235	105.368	0.837%	75mm Class 9
P40	1052.925	1052.231	14.851	4.670%	160mm Class 9

TABLE 3

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P41	1045.930	1046.175	24.184	-1.011%	160mm Class 9
P42	1045.195	1044.506	12.623	5.446%	75mm Class 9
P43	1027.318	1026.781	57.579	0.933%	75mm Class 9
P44	1028.854	1029.468	14.444	-4.243%	75mm Class 9
P45	978.359	978.697	20.490	-1.647%	75mm Class 9
P46	993.437	994.880	70.245	-2.054%	75mm Class 9
P47	994.880	995.234	19.731	-1.789%	75mm Class 9
P48	995.234	995.519	106.415	-0.268%	75mm Class 9
P49	998.116	998.752	12.740	-4.986%	75mm Class 9
P50	998.752	999.365	9.068	-6.747%	75mm Class 9
P51	1005.317	1005.489	95.343	-0.181%	75mm Class 9
P52	1014.900	1016.517	9.630	-17.010%	75mm Class 9
P53	1016.517	1017.472	5.953	-16.186%	75mm Class 9
P54	1029.468	1029.863	8.358	-4.720%	75mm Class 9
P55	1046.175	1046.315	77.352	-0.181%	110mm Class 9
P56	1042.547	1042.193	14.488	2.438%	110mm Class 9
P57	1045.743	1045.064	13.638	4.826%	75mm Class 9
P58	1012.214	1012.069	24.277	0.599%	75mm Class 9
P59	1014.900	1015.162	8.092	-3.238%	75mm Class 9
P60	1017.417	1020.323	63.094	-4.608%	75mm Class 9

TABLE 4

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P61	1042.193	1042.243	10.503	1.429%	110mm Class 9
P62	1106.451	1106.971	9.951	-5.214%	110mm Class 9
P63	1111.671	1111.234	25.938	1.681%	110mm Class 9
P64	1099.533	1100.284	9.694	-7.743%	75mm Class 9
P65	1105.575	1105.668	14.378	-0.640%	75mm Class 9
P66	1089.853	1090.388	13.683	-3.901%	75mm Class 9
P67	1088.705	1089.283	12.880	-3.004%	75mm Class 9
P68	1074.895	1075.193	18.710	-1.590%	75mm Class 9
P69	1082.020	1082.468	17.116	-2.723%	75mm Class 9
P70	1019.906	1018.933	17.633	5.518%	75mm Class 9
P71	1008.708	1008.659	19.993	0.245%	75mm Class 9
P72	1006.659	1006.701	101.630	1.926%	75mm Class 9
P73	988.950	988.873	5.348	1.424%	75mm Class 9
P74	1036.866	1036.874	27.288	-0.028%	75mm Class 9
P75	1036.874	1037.109	13.638	-1.721%	75mm Class 9
P76	1035.653	1035.351	7.722	3.901%	75mm Class 9
P77	1035.351	1034.963	9.870	3.915%	75mm Class 9
P78	1019.906	1018.535	32.022	4.279%	75mm Class 9
P79	1046.464	1047.217	26.757	-2.812%	75mm Class 9
P80	1031.765	1031.726	7.320	0.534%	75mm Class 9

TABLE 5

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P81	1024.903	1024.806	17.095	0.570%	75mm Class 9
P82	1031.396	1031.355	13.180	0.312%	75mm Class 9
P83	1031.355	1031.379	14.187	-0.171%	75mm Class 9
P84	1031.356	1031.002	10.155	3.472%	75mm Class 9
P85	1007.364	1006.486	31.707	2.768%	75mm Class 9
P86	993.776	993.564	9.578	2.207%	75mm Class 9
P87	981.068	980.940	21.318	0.598%	75mm Class 9
P88	981.019	980.186	44.439	1.873%	75mm Class 9
P89	1020.525	1020.328	11.698	1.674%	75mm Class 9
P90	1017.617	1017.753	18.054	-0.754%	75mm Class 9
P91	1017.753	1017.806	7.811	-0.670%	75mm Class 9
P92	1018.529	1018.500	24.970	0.118%	75mm Class 9
P93	1018.500	1017.907	74.243	0.798%	75mm Class 9
P94	1017.086	1016.911	19.006	0.918%	75mm Class 9
P95	1016.949	1015.506	93.975	1.535%	75mm Class 9
P96	1014.433	1014.034	24.975	1.596%	75mm Class 9
P97	1014.034	1013.534	21.584	2.312%	75mm Class 9
P98	997.463	997.624	7.020	-2.274%	75mm Class 9
P99	999.158	1000.452	63.001	-2.053%	75mm Class 9
P100	1000.452	1001.522	66.124	-1.617%	75mm Class 9

TABLE 6

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P101	1001.522	1002.421	69.138	-1.299%	75mm Class 9
P102	1002.421	1003.400	61.394	-1.595%	75mm Class 9
P103	1003.400	1004.460	63.194	-1.677%	75mm Class 9
P104	1004.460	1005.860	70.635	-1.981%	75mm Class 9
P105	1005.860	1006.997	61.363	-1.852%	75mm Class 9
P106	1006.997	1007.171	30.289	-0.575%	75mm Class 9
P107	1007.171	1007.916	31.685	-2.347%	75mm Class 9
P108	1009.782	1011.078	58.437	-2.215%	75mm Class 9
P109	1012.786	1013.381	23.160	-2.562%	75mm Class 9
P110	1013.381	1015.233	67.703	-2.735%	75mm Class 9
P111	1021.098	1020.787	15.705	1.975%	75mm Class 9
P112	1000.799	1000.856	17.984	-0.318%	75mm Class 9
P113	1000.856	1001.310	112.324	-0.404%	75mm Class 9
P114	1001.310	1001.525	8.764	-2.447%	75mm Class 9
P115	1001.525	1002.486	39.852	-2.409%	75mm Class 9
P116	1002.486	1002.784	15.980	-1.861%	75mm Class 9
P117	1002.784	1004.057	53.136	-2.395%	75mm Class 9
P118	1004.057	1004.578	15.987	-3.257%	75mm Class 9
P119	1004.578	1005.653	45.383	-2.367%	75mm Class 9
P120	1005.653	1006.004	15.995	-2.192%	75mm Class 9

TABLE 7

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P121	1006.004	1007.077	47.163	-2.272%	75mm Class 9
P122	1007.077	1007.428	15.995	-2.193%	75mm Class 9
P123	1007.428	1008.803	52.488	-2.620%	75mm Class 9
P124	1006.852	1009.137	15.987	-1.781%	75mm Class 9
P125	1009.137	1009.484	12.576	-2.754%	75mm Class 9
P126	1009.484	1009.555	3.209	-2.189%	75mm Class 9
P127	1010.560	1010.726	9.702	-1.701%	75mm Class 9
P128	1011.169	1011.576	18.020	-2.252%	75mm Class 9
P129	1011.576	1012.285	44.263	-1.601%	75mm Class 9
P130	1012.285	1013.333	46.541	-2.249%	75mm Class 9
P131	995.859	998.261	89.301	-2.690%	75mm Class 9
P132	998.261	998.663	15.786	-2.536%	75mm Class 9
P133	998.663	1001.361	121.213	-2.226%	75mm Class 9
P134	1001.361	1001.806	21.368	-2.079%	75mm Class 9
P135	1001.806	1003.027	128.682	-0.949%	75mm Class 9
P136	999.897	1000.703	41.263	-1.952%	75mm Class 9
P137	1000.703	1002.713	77.711	-2.586%	75mm Class 9
P138	1002.713	1003.146	15.853	-2.727%	75mm Class 9
P139	1003.146	1006.481	139.163	-2.397%	75mm Class 9
P140	1006.481	1007.599	87.800	-1.272%	75mm Class 9

TABLE 8

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P141	996.334	996.426	7.389	-1.244%	75mm Class 9
P142	998.142	998.663	15.897	-3.266%	75mm Class 9
P143	998.663	1000.368	47.968	-3.555%	75mm Class 9
P144	1000.368	1000.999	23.178	-2.719%	75mm Class 9
P145	1000.999	1002.624	43.516	-3.732%	75mm Class 9
P146	1002.624	1003.146	15.640	-3.333%	75mm Class 9
P147	1003.146	1005.032	55.800	-3.380%	75mm Class 9
P148	1059.322	1058.835	14.475	3.357%	75mm Class 9
P149	1029.932	1029.766	17.287	0.955%	75mm Class 9
P150	1029.766	1029.719	8.280	0.575%	75mm Class 9
P151	997.518	997.225	54.142	0.539%	75mm Class 9
P152	1000.835	1000.811	11.549	-1.522%	75mm Class 9
P153	1005.166	1004.750	16.383	2.533%	75mm Class 9
P154	1004.750	1004.576	6.464	2.688%	75mm Class 9
P155	1010.923	1011.159	13.346	-1.761%	110mm Class 9
P156	1073.049	1073.183	13.967	-0.961%	110mm Class 9
P157	1059.322	1058.795	21.658	2.423%	75mm Class 9
P158	1058.795	1058.578	8.950	2.419%	75mm Class 9
P159	1033.514	1033.176	15.733	2.142%	110mm Class 9
P160	1073.049	1073.190	30.580	-0.463%	110mm Class 9

TABLE 9

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P161	1065.975	1065.757	5.465	3.971%	75mm Class 9
P162	1050.429	1050.050	17.627	2.142%	75mm Class 9
P163	1025.653	1024.564	23.145	4.705%	75mm Class 9
P164	1024.564	1024.251	13.057	2.392%	75mm Class 9
P165	1021.831	1021.344	16.584	-2.680%	75mm Class 9
P166	1015.345	1014.530	26.581	3.061%	75mm Class 9
P167	1013.651	1012.325	42.592	3.112%	75mm Class 9
P168	1012.325	1011.702	26.015	2.391%	75mm Class 9
P169	1008.013	1006.649	36.492	3.736%	75mm Class 9
P170	1001.911	1003.715	28.625	-6.305%	75mm Class 9
P171	1003.269	1003.769	60.116	-0.831%	75mm Class 9
P172	1003.786	1004.818	42.471	-2.429%	75mm Class 9
P173	1004.818	1005.893	36.754	-2.921%	75mm Class 9
P174	1008.430	1008.705	44.946	-0.613%	75mm Class 9
P175	1008.830	1007.344	61.391	1.441%	75mm Class 9
P176	1007.344	1006.154	22.428	-0.932%	75mm Class 9
P177	1007.370	1006.478	55.322	1.612%	75mm Class 9
P178	1003.606	1002.337	54.812	2.314%	75mm Class 9
P179	1002.337	1002.143	6.521	2.960%	75mm Class 9
P180	1002.143	1001.047	38.845	2.819%	75mm Class 9

TABLE 10

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P181	1000.431	1000.162	6.970	3.838%	75mm Class 9
P182	1000.169	997.394	105.997	2.618%	110mm Class 9
P183	981.658	980.500	26.601	4.354%	75mm Class 9
P184	975.462	975.217	65.254	0.374%	75mm Class 9
P185	974.655	974.220	28.913	1.505%	75mm Class 9
P186	995.657	988.573	108.557	6.537%	75mm Class 9
P187	988.573	983.352	181.570	2.876%	75mm Class 9
P188	968.258	970.502	35.985	-6.242%	75mm Class 9
P189	972.817	973.215	28.220	-1.408%	75mm Class 9
P190	974.429	974.552	9.167	-1.341%	75mm Class 9
P191	974.552	974.689	10.140	-1.341%	75mm Class 9
P192	1045.766	1045.235	23.341	2.272%	75mm Class 9
P193	1045.235	1045.278	27.493	-0.156%	75mm Class 9
P194	1048.028	1048.521	17.923	-2.748%	75mm Class 9
P195	1048.521	1048.795	10.423	-2.618%	75mm Class 9
P196	1057.209	1057.152	19.244	0.297%	75mm Class 9
P197	1057.152	1057.092	13.959	0.430%	75mm Class 9
P198	1067.731	1068.677	26.321	-3.591%	75mm Class 9
P199	1068.677	1068.830	4.042	-3.753%	75mm Class 9
P200	1080.205	1080.453	26.660	-0.930%	75mm Class 9

TABLE 11

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P201	1080.453	1080.504	8.128	-0.618%	75mm Class 9
P202	1080.560	1080.565	18.929	-0.025%	75mm Class 9
P203	1080.571	1080.579	3.885	-0.204%	75mm Class 9
P204	1080.034	1079.422	78.541	0.779%	75mm Class 9
P205	1078.544	1078.099	55.518	-1.000%	75mm Class 9
P206	1083.674	1083.939	38.528	-0.688%	160mm Class 9
P207	1083.939	1084.356	40.241	-1.037%	160mm Class 9
P208	1094.614	1096.177	27.120	-2.074%	200mm Class 9
P209	1095.177	1096.145	48.564	-1.992%	200mm Class 9
P210	1113.761	1113.437	13.011	2.489%	200mm Class 9
P211	1111.128	1110.151	89.315	1.093%	75mm Class 9
P212	1106.619	1106.510	24.408	0.446%	75mm Class 9
P213	1106.451	1105.844	61.129	0.993%	200mm Class 9
P214	1100.138	1099.533	23.217	2.606%	160mm Class 9
P215	1099.533	1099.207	15.912	2.043%	160mm Class 9
P216	1090.166	1089.853	16.705	1.868%	160mm Class 9
P217	1089.853	1089.498	16.711	2.120%	160mm Class 9
P218	1075.241	1074.895	13.714	2.518%	160mm Class 9
P219	1074.895	1074.540	11.296	3.126%	160mm Class 9
P220	1055.755	1055.615	16.743	0.837%	160mm Class 9

TABLE 12

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P221	1045.996	1046.143	10.393	-1.405%	75mm Class 9
P222	1046.481	1046.658	22.248	-0.794%	75mm Class 9
P223	1032.193	1031.932	12.614	2.064%	75mm Class 9
P224	1025.418	1024.903	16.873	3.046%	75mm Class 9
P225	1024.903	1024.504	12.931	3.081%	75mm Class 9
P226	1002.356	1001.816	15.176	3.550%	75mm Class 9
P227	1049.360	1049.044	18.010	1.756%	75mm Class 9
P228	1005.149	1005.482	11.441	-2.906%	75mm Class 9
P229	1017.206	1017.291	12.370	-0.688%	75mm Class 9
P230	1017.291	1017.342	12.583	-0.404%	75mm Class 9
P231	1026.419	1029.766	19.006	-1.821%	75mm Class 9
P232	1029.766	1029.960	10.560	-1.823%	75mm Class 9
P233	1032.193	1031.432	38.995	1.951%	110mm Class 9
P234	1012.671	1012.043	14.856	4.216%	110mm Class 9
P235	1012.043	1010.813	29.295	4.200%	110mm Class 9
P236	998.786	999.158	138.139	-0.267%	75mm Class 9
P237	1002.784	1002.250	119.198	0.448%	75mm Class 9
P238	1002.250	1002.128	17.964	0.678%	75mm Class 9
P239	1002.128	1001.522	137.566	0.441%	75mm Class 9
P240	1004.578	1003.831	120.020	0.622%	75mm Class 9

TABLE 13

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P241	1003.831	1003.784	17.954	0.263%	75mm Class 9
P242	1003.784	1002.421	136.736	0.997%	75mm Class 9
P243	1006.004	1005.219	120.750	0.650%	75mm Class 9
P244	1005.219	1005.027	17.956	1.070%	75mm Class 9
P245	1005.027	1003.400	136.032	1.198%	75mm Class 9
P246	1007.428	1006.570	121.491	0.706%	75mm Class 9
P247	1006.570	1006.457	17.954	0.628%	75mm Class 9
P248	1006.457	1004.460	135.239	1.476%	75mm Class 9
P249	1009.137	1009.111	7.835	0.323%	75mm Class 9
P250	1007.881	1007.791	17.945	0.497%	75mm Class 9
P251	1007.791	1005.860	134.393	1.437%	75mm Class 9
P252	1011.576	1009.023	112.946	2.260%	75mm Class 9
P253	1009.023	1007.791	80.166	1.536%	75mm Class 9
P254	1007.791	1007.484	15.964	1.922%	75mm Class 9
P255	1007.484	1006.457	54.640	1.879%	75mm Class 9
P256	1006.457	1006.051	15.956	2.540%	75mm Class 9
P257	1006.051	1005.027	47.199	2.169%	75mm Class 9
P258	1005.027	1004.867	15.968	0.999%	75mm Class 9
P259	1004.867	1003.784	45.395	2.384%	75mm Class 9
P260	1003.784	1002.128	69.152	2.394%	75mm Class 9

TABLE 14

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P261	1002.128	1001.662	15.969	2.913%	75mm Class 9
P262	1001.662	1000.799	48.060	1.795%	75mm Class 9
P263	1000.799	1000.369	15.996	2.684%	75mm Class 9
P264	1000.369	998.786	46.977	3.368%	75mm Class 9
P265	998.786	998.187	16.003	3.738%	75mm Class 9
P266	998.187	996.890	38.365	3.377%	75mm Class 9
P267	996.720	996.649	7.249	0.875%	75mm Class 9
P268	997.463	997.494	6.652	-0.462%	75mm Class 9
P269	991.857	990.380	24.218	6.101%	75mm Class 9
P270	992.187	992.970	11.809	-6.626%	75mm Class 9
P271	992.954	993.875	20.287	-4.537%	75mm Class 9
P272	999.896	1000.210	17.889	-1.749%	75mm Class 9
P273	1000.210	999.765	77.542	0.573%	75mm Class 9
P274	997.575	997.395	15.638	1.147%	75mm Class 9
P275	997.395	996.963	8.153	5.283%	75mm Class 9
P276	993.595	993.818	22.872	-0.971%	75mm Class 9
P277	993.801	995.878	80.622	-2.576%	75mm Class 9
P278	995.878	996.334	15.701	-2.897%	75mm Class 9
P279	996.334	998.282	84.017	-2.319%	75mm Class 9
P280	998.946	998.979	2.766	-1.160%	75mm Class 9

TABLE 15

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P281	999.290	1000.429	89.241	-1.276%	75mm Class 9
P282	1000.827	1001.131	8.401	-3.595%	75mm Class 9
P283	1003.027	1005.259	53.783	-4.149%	75mm Class 9
P284	1005.259	1005.170	13.963	0.637%	75mm Class 9
P285	1005.170	1003.971	118.089	1.015%	75mm Class 9
P286	1003.971	1003.688	21.388	1.318%	75mm Class 9
P287	1003.688	1001.056	113.980	2.309%	75mm Class 9
P288	1001.056	1000.417	23.229	2.748%	75mm Class 9
P289	1000.417	998.109	103.720	2.225%	75mm Class 9
P290	995.470	1000.951	121.012	-4.533%	75mm Class 9
P291	1000.951	1001.549	17.791	-3.354%	75mm Class 9
P292	1001.549	998.402	194.391	1.619%	75mm Class 9
P293	996.539	1003.268	121.471	-5.216%	75mm Class 9
P294	1003.268	1003.594	24.592	-1.323%	75mm Class 9
P295	1003.594	1002.764	58.761	1.412%	75mm Class 9
P296	1002.764	999.908	123.718	2.308%	75mm Class 9
P297	999.908	999.429	16.127	2.964%	75mm Class 9
P298	999.446	997.979	165.524	0.886%	75mm Class 9
P299	997.979	998.126	23.077	-0.634%	75mm Class 9
P300	992.954	993.032	7.121	-1.103%	75mm Class 9

TABLE 16

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P301	994.877	995.470	12.504	-4.738%	75mm Class 9
P302	999.315	1005.223	123.709	-4.618%	75mm Class 9
P303	1005.023	1005.503	17.828	-2.688%	75mm Class 9
P304	1000.210	1000.319	7.617	-1.424%	75mm Class 9
P305	1001.278	1001.549	15.949	-1.693%	75mm Class 9
P306	1001.549	1003.288	53.414	-3.253%	75mm Class 9
P307	1003.286	1003.714	22.693	-1.886%	75mm Class 9
P308	1003.714	1005.470	37.549	-3.050%	75mm Class 9
P309	1005.470	1005.503	5.199	-0.640%	75mm Class 9
P310	1005.503	1006.580	50.283	-2.140%	75mm Class 9
P311	1006.580	1006.975	16.289	-2.422%	75mm Class 9
P312	1006.975	1007.909	40.680	-2.293%	75mm Class 9
P313	1007.909	1008.329	18.057	-2.326%	75mm Class 9
P314	996.354	997.511	59.143	-1.956%	75mm Class 9
P315	997.511	997.401	15.943	0.687%	75mm Class 9
P316	997.401	998.720	33.743	-3.907%	75mm Class 9
P317	998.720	998.828	20.585	-0.527%	75mm Class 9
P318	995.687	996.716	23.244	-4.425%	75mm Class 9
P319	996.716	997.401	15.973	-4.284%	75mm Class 9
P320	997.401	1000.530	64.439	-4.859%	75mm Class 9

TABLE 17

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P321	1001.720	1003.806	38.911	-5.364%	75mm Class 9
P322	1003.806	1004.397	14.064	-4.188%	75mm Class 9
P323	1004.397	1008.033	114.696	-3.171%	75mm Class 9
P324	1008.033	1008.329	14.611	-2.024%	75mm Class 9
P325	1008.329	1005.237	127.234	2.431%	75mm Class 9
P326	1005.237	1005.146	5.750	1.574%	75mm Class 9
P327	1005.146	1004.178	55.983	2.693%	75mm Class 9
P328	1004.178	1002.419	70.280	2.499%	75mm Class 9
P329	1002.419	1001.970	15.632	2.868%	75mm Class 9
P330	1001.970	1000.647	32.565	4.061%	75mm Class 9
P331	1004.397	1003.378	66.528	1.530%	75mm Class 9
P332	1003.378	1003.085	12.073	2.427%	75mm Class 9
P333	1003.085	1006.696	102.003	-3.541%	75mm Class 9
P334	1006.696	1006.575	17.800	-1.567%	75mm Class 9
P335	1006.575	1004.997	94.091	2.102%	75mm Class 9
P336	1004.997	1004.915	9.827	0.826%	75mm Class 9
P337	1004.915	1004.624	26.550	1.097%	75mm Class 9
P338	1004.624	1004.176	10.852	4.113%	75mm Class 9
P339	1004.915	1004.373	13.335	4.060%	75mm Class 9
P340	1004.373	1003.457	42.117	2.173%	75mm Class 9

TABLE 18

PIPE LIST-WATER

| PIPE NAME | START INVERT LEVEL | END INVERT LEVEL | 3

TABLE 25

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P481	1019,203	1019,590	8,694	-4,437%	75mm Class 9
P482	1019,845	1020,043	14,151	-1,392%	75mm Class 9
P483	1020,043	1020,063	1,902	-1,037%	75mm Class 9
P484	1020,063	1020,416	26,645	-1,325%	75mm Class 9
P485	1020,416	1021,073	127,114	-0,517%	75mm Class 9
P486	1021,073	1020,453	29,878	2,074%	75mm Class 9
P487	1020,453	1019,720	35,270	2,077%	75mm Class 9
P488	1019,720	1019,697	10,713	0,213%	75mm Class 9
P489	1019,697	1019,461	14,310	1,649%	75mm Class 9
P490	1019,461	1019,086	16,295	2,300%	75mm Class 9
P491	1019,086	1018,704	20,457	1,862%	75mm Class 9
P492	1018,704	1018,465	41,799	0,571%	75mm Class 9
P493	1018,465	1018,188	38,324	0,724%	75mm Class 9
P494	1018,188	1018,058	24,856	0,520%	75mm Class 9
P495	1018,058	1018,220	7,145	-2,251%	75mm Class 9
P496	1018,220	1017,800	36,867	1,138%	75mm Class 9
P497	1017,800	1017,586	9,500	2,244%	75mm Class 9
P498	1017,586	1016,918	29,567	2,256%	75mm Class 9
P499	1016,918	1016,329	22,516	2,614%	75mm Class 9
P500	1020,043	1019,546	22,214	2,232%	75mm Class 9

TABLE 26

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P501	1019,546	1018,852	32,084	2,162%	75mm Class 9
P502	1018,852	1018,665	11,284	1,658%	75mm Class 9
P503	1017,989	1017,800	7,928	2,380%	75mm Class 9
P504	1018,994	1018,428	35,866	1,575%	75mm Class 9
P505	1018,428	1017,987	28,716	1,537%	75mm Class 9
P506	1017,987	1017,841	8,082	1,794%	75mm Class 9
P507	1017,841	1017,100	29,322	2,526%	75mm Class 9
P508	1017,100	1016,864	33,693	0,699%	75mm Class 9
P509	1016,864	1015,948	19,225	4,767%	75mm Class 9
P510	1017,402	1017,493	1,569	5,660%	75mm Class 9
P511	1017,493	1018,994	68,711	2,184%	75mm Class 9
P512	987,107	987,302	54,172	1,466%	75mm Class 9
P513	987,107	988,754	53,231	-3,093%	75mm Class 9
P514	988,754	989,453	27,852	-2,508%	75mm Class 9
P515	989,453	989,035	31,243	1,336%	75mm Class 9
P516	989,035	988,647	32,543	1,193%	75mm Class 9
P517	988,311	988,997	45,782	1,496%	75mm Class 9
P518	988,647	988,311	14,482	2,310%	75mm Class 9
P519	1058,125	1058,969	5,443	2,494%	75mm Class 9
P520	1057,413	1057,430	10,551	-0,153%	75mm Class 9

TABLE 27

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P521	1057,430	1056,434	49,216	2,023%	75mm Class 9
P522	1056,434	1055,410	28,127	3,637%	75mm Class 9
P523	1055,410	1055,558	4,223	-3,467%	75mm Class 9
P524	1055,558	1054,333	38,847	3,153%	75mm Class 9
P525	1054,333	1054,751	21,243	-1,969%	75mm Class 9
P526	1054,751	1053,165	51,421	3,085%	75mm Class 9
P527	1053,165	1053,072	3,064	3,003%	75mm Class 9
P528	1053,072	1050,912	59,884	3,607%	75mm Class 9
P529	1050,912	1050,305	32,592	1,864%	75mm Class 9
P530	1050,305	1050,910	39,750	-1,522%	75mm Class 9
P531	1050,910	1051,434	28,132	-1,863%	75mm Class 9
P532	1051,434	1051,627	28,140	-0,683%	75mm Class 9
P533	1051,627	1051,682	11,236	-0,488%	75mm Class 9
P534	1051,682	1052,708	30,534	-3,360%	75mm Class 9
P535	1052,708	1053,017	14,682	-2,098%	75mm Class 9
P536	1053,017	1053,343	37,147	-0,876%	75mm Class 9
P537	1053,343	1053,291	36,974	0,138%	75mm Class 9
P538	1053,291	1053,266	12,378	0,203%	75mm Class 9
P539	1053,266	1053,286	4,757	-0,423%	75mm Class 9
P540	1053,286	1053,264	2,731	0,814%	75mm Class 9

TABLE 28

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P541	1053,264	1052,614	53,309	1,218%	75mm Class 9
P542	1052,614	1052,395	26,562	0,824%	75mm Class 9
P543	1052,395	1052,611	11,867	-1,812%	75mm Class 9
P544	1052,611	1053,182	24,838	-2,299%	75mm Class 9
P545	1053,182	1054,113	26,524	-3,509%	75mm Class 9
P546	1054,113	1055,594	47,893	-3,091%	75mm Class 9
P547	1055,594	1056,017	12,549	-3,364%	75mm Class 9
P548	1056,017	1056,591	22,039	-2,601%	75mm Class 9
P549	1056,591	1057,483	35,537	-2,511%	75mm Class 9
P550	1057,483	1058,087	47,277	-1,277%	75mm Class 9
P551	1058,087	1058,961	24,784	-3,522%	75mm Class 9
P552	1058,961	1059,071	4,518	-2,422%	75mm Class 9
P553	1059,071	1059,615	23,067	-2,356%	75mm Class 9
P554	1059,615	1059,695	1,872	-4,184%	75mm Class 9
P555	1059,695	1060,952	41,249	-3,047%	75mm Class 9
P556	1060,952	1060,623	51,719	0,636%	75mm Class 9
P557	1060,623	1060,101	40,713	1,281%	75mm Class 9
P558	1060,101	1059,702	16,363	2,430%	75mm Class 9
P559	1059,702	1058,919	45,648	1,715%	75mm Class 9
P560	1058,919	1056,652	22,099	1,205%	75mm Class 9

TABLE 29

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P561	1058,652	1059,174	27,657	-1,883%	75mm Class 9
P562	1059,174	1059,890	26,808	-2,670%	75mm Class 9
P563	1059,890	1060,813	34,973	-2,638%	75mm Class 9
P564	1053,072	1053,301	45,089	-0,508%	75mm Class 9
P565	1053,301	1053,508	6,884	-2,992%	75mm Class 9
P566	1053,508	1054,065	72,589	-0,767%	75mm Class 9
P567	1054,065	1054,064	27,116	0,004%	75mm Class 9
P568	1054,064	1054,296	38,076	-0,609%	75mm Class 9
P569	1054,296	1055,433	33,671	-3,374%	75mm Class 9
P570	1055,433	1055,104	13,556	2,425%	75mm Class 9
P571	1055,104	1055,091	1,770	0,700%	75mm Class 9
P572	1055,091	1055,388	9,969	-2,968%	75mm Class 9
P573	1055,388	1055,085	40,103	0,753%	75mm Class 9
P574	1055,085	1056,132	29,793	-3,511%	75mm Class 9
P575	1056,132	1055,932	15,107	1,321%	75mm Class 9
P576	1055,932	1055,594	27,428	1,232%	75mm Class 9
P577	1056,132	1056,153	1,746	-1,213%	75mm Class 9
P578	1056,153	1056,222	36,667	-0,188%	75mm Class 9
P579	1056,222	1056,267	33,291	-0,137%	75mm Class 9
P580	1056,267	1056,562	37,630	-0,783%	75mm Class 9

TABLE 30

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P581	1056,562	1058,242	58,535	-2,870%	75mm Class 9
P582	1058,242	1057,930	9,288	3,349%	75mm Class 9
P583	1057,930	1057,543	39,001	0,992%	75mm Class 9
P584	1057,543	1057,160	23,123	1,653%	75mm Class 9
P585	1057,160	1056,846	11,946	4,297%	75mm Class 9
P586	1056,846	1056,126	42,510	1,222%	75mm Class 9
P587	1056,126	1056,198	31,711	-0,225%	75mm Class 9
P588	1056,198	1057,144	36,613	-2,570%	75mm Class 9
P589	1057,144	1057,881	20,504	-3,589%	75mm Class 9
P590	1057,881	1058,570	24,642	-2,794%	75mm Class 9
P591	1058,570	1058,652	4,216	-1,950%	75mm Class 9
P592	1058,570	1058,197	27,331	1,361%	75mm Class 9
P593	1058,197	1057,413	52,287	1,499%	75mm Class 9
P594	1058,242	1058,286	1,610	-2,655%	75mm Class 9
P595	1058,286	1058,276	42,452	0,023%	75mm Class 9
P596	1058,276	1058,080	25,015	0,783%	75mm Class 9
P597	1058,080	1058,229	6,521	-2,283%	75mm Class 9
P598	1058,229	1058,087	7,339	1,926%	75mm Class 9
P599	1059,695	1059,710	21,986	-0,070%	75mm Class 9
P600	1059,710	1059,520	25,252	0,750%	75mm Class 9

TABLE 31

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P601	1053,291	1054,256	35,953	-2,794%	75mm Class 9
P602	1053,266	1052,033	40,061	3,129%	75mm Class 9
P603	1052,033	1052,072	54,688	-0,072%	75mm Class 9
P604	1052,395	1051,527	32,140	2,700%	75mm Class 9
P605	1051,527	1051,710	25,973	-0,704%	75mm Class 9
P606	1073,141	1073,045	20,974	0,453%	75mm Class 9
P607	1072,122	1071,476	46,525	1,389%	75mm Class 9
P608	1071,476	1070,427	56,056	1,870%	75mm Class 9
P609	1070,427	1069,902	18,560	2,828%	75mm Class 9
P610	1069,902	1069,562	19,145	1,772%	75mm Class 9
P611	1069,562	1068,671	40,538	2,198%	75mm Class 9
P612	1068,671	1068,796	31,200	-0,400%	75mm Class 9
P613	1068,796	1069,019	43,700	-0,510%	75mm Class 9
P614	1069,019	1069,376	34,820	-1,024%	75mm Class 9
P615	1069,376	1069,555	42,837	-0,418%	75mm Class 9
P616	1069,586	1069,610	1,769	-1,344%	75mm Class 9
P617	1069,610	1069,716	7,872	-1,344%	75mm Class 9
P618	1069,716	1069,921	32,138	-0,638%	75mm Class 9
P619	1069,921	1069,896	27,429	0,092%	75mm Class 9
P620	1069,896	1069,744	29,571	0,512%	75mm Class 9

TABLE 32

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P621	1069,744	1069,793	28,964	-0,169%	75mm Class 9
P622	1069,793	1069,471	26,408	1,219%	75mm Class 9
P623	1069,471	1069,267	23,896	0,850%	75mm Class 9
P624	1069,267	1069,198	30,989	0,224%	75mm Class 9
P625	1069,198	1068,716	20,896	2,303%	75mm Class 9
P626	1068,716	1068,357	22,227	1,616%	75mm Class 9
P627	1068,357	1068,291	4,027	1,627%	75mm Class 9
P628	1067,681	1070,342	76,252	-3,489%	75mm Class 9
P629	1068,291	1067,703	49,742	1,181%	75mm Class 9
P630	1069,902	1069,563	17,105	1,979%	75mm Class 9
P631	1069,578	1068,344	44,424	2,775%	75mm Class 9
P632	1068,344	1068,189	62,066	0,250%	75mm Class 9
P633	1068,189	1067,872	24,518	1,292%	75mm Class 9
P634	1067,872	1067,945	4,294	-1,698%	75mm Class 9
P635	1067,945	1068,079	26,723	-0,498%	75mm Class 9
P636	1068,079	1068,168	29,604	-0,300%	75mm Class 9
P637	1068,168	1068,375	4,023	-5,120%	75mm Class 9
P638	1068,375	1068,826	25,856	-1,745%	75mm Class 9
P639	1068,826	1069,264	22,191	-1,972%	75mm Class 9
P640	1069,264	1069,960	41,729	-1,714%	75mm Class 9

TABLE 33

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P641	1069,980	1070,344	36,437	-0,998%	75mm Class 9
P642	1070,344	1070,349	21,693	-0,025%	75mm Class 9
P643	1070,349	1070,233	21,233	0,548%	75mm Class 9
P644	1074,289	1074,793	18,968	-2,657%	75mm Class 9
P645	1074,440	1073,747	50,169	1,381%	75mm Class 9
P646	1073,747	1073,591	11,204	1,387%	75mm Class 9
P647	1073,591	1073,313	28,715	0,965%	75mm Class 9
P648	1073,313	1073,218	6,233	1,529%	75mm Class 9
P649	1073,218	1073,154	2,485	2,548%	75mm Class 9
P650	1073,154	1072,162	45,088	2,199%	75mm Class 9
P651	1072,162	1070,996	66,049	1,765%	75mm Class 9
P652	1070,996	1070,563	17,349	2,490%	75mm Class 9
P653	1070,563	1070,479	6,891	1,220%	75mm Class 9
P654	1070,479	1069,694	33,898	2,314%	75mm Class 9
P655	1069,694	1069,586	5,363	2,010%	75mm Class 9
P656	1069,610	1068,715	39,123	2,287%	75mm Class 9
P657	1068,715	1067,334	50,039	2,758%	75mm Class 9
P658	1070,563	1071,295	46,799	-1,562%	75mm Class 9
P659	1071,295	1071,708	27,878	-1,482%	75mm Class 9
P660	1071,708	1071,880	23,457	-0,732%	75mm Class 9

TABLE 34

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P661	1071,880	1071,095	30,712	2,554%	75mm Class 9
P662	1071,095	1069,744	47,621	2,836%	75mm Class 9
P663	1069,744	1069,704	1,522	2,627%	75mm Class 9
P664	1069,704	1068,842	28,354	3,038%	75mm Class 9
P665	1068,842	1068,059	32,404	2,414%	75mm Class 9
P666	1071,095	1071,025	32,620	0,214%	75mm Class 9
P667	1071,025	1071,134	22,488	-0,483%	75mm Class 9
P668	1071,134	1071,044	19,073	0,472%	75mm Class 9
P669	1071,044	1070,811	22,422	1,037%	75mm Class 9
P670	1070,811	1070,553	23,059	1,119%	75mm Class 9
P671	1070,553	1070,474	29,533	0,265%	75mm Class 9
P672	1070,474	1068,357	62,856	3,369%	75mm Class 9
P673	1073,218	1073,107	6,524	1,691%	75mm Class 9
P674	1071,632	1070,427	55,641	2,164%	75mm Class 9
P675	1092,157	1093,274	29,362	-3,800%	75mm Class 9
P676	1092,157	1061,998	10,269	1,546%	75mm Class 9
P677	1061,998	1062,110	12,187	-0,919%	75mm Class 9
P678	1062,444	1062,416	25,217	0,108%	75mm Class 9
P679	1062,416	1062,532	17,145	-0,673%	75mm Class 9
P680	1062,532	1061,731	25,170	3,181%	75mm Class 9

TABLE 35

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P681	1061,731	1060,191	43,627	3,529%	75mm Class 9
P682	1060,191	1059,570	12,306	5,047%	75mm Class 9
P683	1059,570	1058,993	54,706	1,053%	75mm Class 9
P684	1058,993	1059,004	12,970	-0,084%	75mm Class 9
P685	1059,004	1059,418	29,001	-1,426%	75mm Class 9
P686	1059,418	1060,581	74,584	-1,559%	75mm Class 9
P687	1060,581	1061,524	27,582	-3,415%	75mm Class 9
P688	1061,524	1062,288	27,140	-2,816%	75mm Class 9
P689	1062,288	1062,524	60,376	-0,389%	75mm Class 9
P690	1062,524	1062,532	33,956	-0,025%	75mm Class 9
P691	1060,046	1059,330	26,037	2,747%	160mm Class 9
P692	1060,046	1059,469	62,913	0,693%	75mm Class 9
P693	1059,469	1059,712	17,191	-1,412%	75mm Class 9
P694	1059,712	1060,698	32,006	-3,080%	75mm Class 9
P695	1060,698	1061,984	37,482	-3,431%	75mm Class 9
P696	1061,984	1062,827	23,250	-3,625%	75mm Class 9
P697	1062,827	1062,904	4,990	-1,515%	75mm Class 9
P698	1062,904	1062,777	5,601	2,243%	75mm Class 9
P699	1062,777	1061,978	36,580	2,184%	75mm Class 9
P700	1061,978	1064,543	83,580	-3,070%	75mm Class 9

TABLE 36

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P701	1064,543	1065,160	63,330	-0,974%	75mm Class 9
P702	1065,160	1065,277	32,386	-0,360%	75mm Class 9
P703	1065,500	1063,443	63,465	3,241%	160mm Class 9
P704	1065,277	1065,439	40,010	-0,405%	75mm Class 9
P705	1063,443	1062,411	39,377	2,620%	160mm Class 9
P706	1062,904	1063,443	94,914	-0,568%	75mm Class 9
P707	1064,543	1063,566	65,647	1,484%	75mm Class 9
P708	1065,959	1065,961	10,907	-0,022%	75mm Class 9
P709	1065,499	1065,113	31,616	1,221%	75mm Class 9
P710	1065,113	1065,077	3,170	1,114%	75mm Class 9
P711	1065,077	1064,517	41,007	1,366%	75mm Class 9
P712	1064,517	1064,443	12,735	0,577%	75mm Class 9
P713	1064,443	1063,782	38,151	1,730%	75mm Class 9
P714	1063,782	1063,553	11,100	2,063%	75mm Class 9
P715	1063,536	1063,415	3,751	3,195%	75mm Class 9
P716	1063,432	1062,607	49,205	1,677%	75mm Class 9
P717	1062,607	1062,209	22,883	1,738%	75mm Class 9
P718	1062,209	1062,151	6,219	0,929%	75mm Class 9
P719	1062,151	1061,144	56,157	1,793%	75mm Class 9
P720	1061,144	1060,338	30,874	2,607%	75mm Class 9

TABLE 37

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P721	1060,338	1059,767	28,030	2,038%	75mm Class 9
P722	1059,767	1058,945	28,508	2,881%	75mm Class 9
P723	1058,945	1058,225	27,717	2,595%	75mm Class 9
P724	1058,225	1057,261	33,625	2,865%	75mm Class 9
P725	1057,261	1056,414	32,377	2,614%	75mm Class 9
P726	1056,414	1056,121	12,329	2,376%	75mm Class 9
P727	1056,121	1054,475	56,505	2,913%	75mm Class 9
P728	1051,925	1051,720	28,493	0,720%	75mm Class 9
P729	1052,633	1051,925	19,000	3,721%	75mm Class 9
P730	1065,060	1065,462	39,229	-1,023%	75mm Class 9
P731	1065,462	1065,547	34,539	-0,246%	75mm Class 9
P732	1065,547	1065,296	19,899	1,261%	75mm Class 9
P733	1065,296	1065,097	6,224	3,175%	75mm Class 9
P734	1065,097	1065,065	28,805	0,111%	75mm Class 9
P735	1065,065	1064,272	28,229	2,808%	75mm Class 9
P736	1064,272	1064,254	2,526	0,699%	75mm Class 9
P737	1064,254	1063,981	10,596	2,569%	75mm Class 9
P738	1063,981	1063,980	3,197	0,029%	75mm Class 9
P739	1063,980	1064,219	28,389	-0,838%	75mm Class 9
P740	1064,219	1063,631	29,753	1,975%	75mm Class 9

TABLE 38

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P741	1063,631	1063,564	19,977	0,331%	75mm Class 9
P742	1063,564	1063,793	29,988	-0,762%	75mm Class 9
P743	1063,793	1063,415	41,374	0,912%	75mm Class 9
P744	1063,631	1063,395	23,320	1,007%	75mm Class 9
P745	1062,134	1062,358	39,799	-0,564%	75mm Class 9
P746	1062,358	1062,181	40,297	0,440%	75mm Class 9
P747	1062,181	1061,696	46,667	1,039%	75mm Class 9
P748	1062,192	1062,164	12,120	0,232%	75mm Class 9
P749	1062,164	1061,981	31,189	0,586%	75mm Class 9
P750	1061,981	1061,784	28,712	0,683%	75mm Class 9
P751	1061,784	1061,781	7,087	0,056%	75mm Class 9
P752	1061,781	1062,138	19,236	-1,856%	75mm Class 9
P753	1062,138	1061,711	16,485	2,587%	75mm Class 9
P754	1061,711	1061,709	2,671	0,056%	75mm Class 9
P755	1061,709	1062,315	31,959	-1,895%	75mm Class 9
P756	1062,315	1062,351	2,434	-1,423%	75mm Class 9
P757	1062,351	1063,035	39,136	-1,749%	75mm Class 9
P758	1063,035	1063,448	24,031	-1,718%	75mm Class 9
P759	1063,448	1063,428	2,719	0,717%	75mm Class 9
P760	1063,428	1063,536	28,239	-0,381%	75mm Class 9

TABLE 39

PIPE LIST-WATER

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P761	1064,426	1063,898	56,115	0,940%	75mm Class 9
P762	1063,898	1063,492	13,092	3,097%	75mm Class 9
P763	1063,492	1062,948	27,354	1,985%	75mm Class 9
P764	1059,750	1059,816	39,735	-0,165%	75mm Class 9
P765	1059,816	1059,500	11,419	2,753%	75mm Class 9
P766	1059,500	1059,421	27,507	0,289%	75mm Class 9
P767	1059,421	1059,461	3,702	-1,067%	75mm Class 9
P768	1059,461	1058,828	35,832	1,764%	75mm Class 9
P769	1058,828	1057,821	30,132	3,342%	75mm Class 9
P770	1057,821	1057,508	20,957	1,491%	75mm Class 9
P771	1057,508	1056,623	38,780	2,280%	75mm Class 9
P772	1056,623	1056,989	24,052	-1,521%	75mm Class 9
P773	1056,989	1056,248	26,352	2,812%	75mm Class 9
P774	1056,248	1055,821	13,189	3,231%	75mm Class 9
P775	1055,821	1054,338	59,175	2,506%	75mm Class 9
P776	1054,475	1052,633	63,385	2,906%	75mm Class 9
P777	1054,338	1054,458	71,134	-0,168%	75mm Class 9
P778	1060,891	1059,775	55,582	2,007%	75mm Class 9
P779	1059,775	1059,461	26,685	1,175%	75mm Class 9
P780	1059,775	1059,162	40,505	1,512%	75mm Class 9

TABLE 40

PIPE LIST-WATER

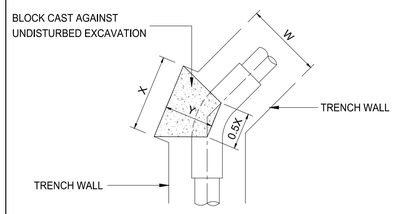
PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P781	990,203	990,517	9,636	3,247%	75mm Class 9
P782	992,091	992,164	44,127	0,164%	75mm Class 9
P783	992,164	991,839	59,859	0,541%	75mm Class 9
P784	991,839	990,282	99,378	1,567%	75mm Class 9
P785	990,282	989,601	69,900	0,974%	75mm Class 9
P786	989,601	988,453	60,158	1,906%	75mm Class 9
P787	988,453	988,524	11,070	0,637%	75mm Class 9
P788	988,524	989,068	28,543	1,903%	75mm Class 9
P789	989,068	989,483	27,412	1,514%	75mm Class 9
P790	989,968	990,158	25,835	0,735%	75mm Class 9
P791	990,158	990,144	33,828	0,041%	75mm Class 9
P792	990,144	990,358	42,716	0,501%	75mm Class 9
P793	989,483	989,968	22,802	2,123%	75mm Class 9
P794	1008,265	1008,430	22,754	0,721%	75mm Class 9
P795	1007,801	1008,265	31,536	1,470%	75mm Class 9
P796	1007,303	1007,801	24,038	2,071%	75mm Class 9
P797	1006,781	1007,303	28,210	1,845%	75mm Class 9
P798	1006,267	1006,781	30,139	1,704%	75mm Class 9
P799	1006,407	1006,267	8,459	1,641%	75mm Class 9
P800	1005,893	1006,261	30,438	1,210%	75mm Class 9

TABLE 41

PIPE LIST-WATER

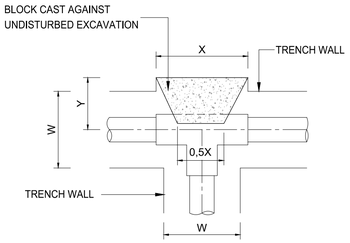
PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH TO INSIDE EDGES	SLOPE	DIAMETER AND CLASS
P801	1006,136	1003,606	80,849	3,131%	75mm Class 9
P802	1008,014	1007,370	14,391	4,469%	75mm Class 9
P803	1000,827	1000,648	26,620	0,673%	75mm Class 9
P804	1000,648	1000,664	45,452	-0,037%	75mm Class 9
P805	1000,026	999,430	43,915	1,356%	75mm Class 9
P806	999,430	999,446	10,403	-0,148%	75mm Class 9
P807	999,320	999,486	9,709	-1,701%	75mm Class 9
P808	999,486	1000,002	13,753	-3,748%	75mm Class 9
P809	990,187	989,902	11,483	2,471%	110mm Class 9
P810	982,957	978,997	101,570	3,901%	110mm Class 9
P811	975,417	975,373	15,435	0,282%	110mm Class 9
P812	975,373	975,483	47,766	-0,230%	110mm Class 9
P813	975,483	975,520	14,273	-0,256%	110mm Class 9
P814	975,520	980,315	83,736	-5,734%	110mm Class 9
P815	982,679	984,023	11,419	-11,834%	110mm Class 9
P816	988,552	990,869	51,873	-4,468%	110mm Class 9
P817	980,186	979,857	28,469	1,153%	75mm Class 9
P818	979,857	978,815	57,828	1,803%	75mm Class 9
P819	978,815	976,632	68,469	3,188%	75mm Class 9
P820	974,417	975,527	30,469	3,641%	75mm Class 9

TABLE



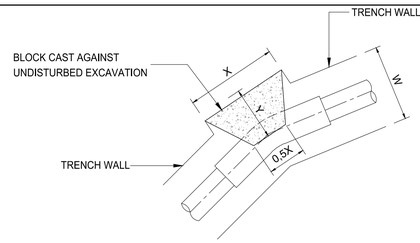
THRUST BLOCK FOR 45° BEND

NOMINAL DIAMETER Ø (mm)	DIMENSIONS				
	D (mm)	Z (mm)	X (mm)	Y (mm)	VOL. (m³)
300	1 400	700	2 000	1 000	1,400
250	1 300	650	1 600	800	0,800
200	1 200	600	1 200	600	0,430
150	1 000	500	1 000	500	0,250
100	1 000	500	350	250	0,043
75	800	400	350	200	0,028



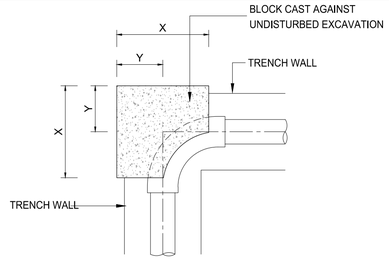
THRUST BLOCK FOR TEE

NOMINAL DIAMETER Ø (mm)	DIMENSIONS				
	D (mm)	Z (mm)	X (mm)	Y (mm)	VOL. (m³)
300	1 400	700	2 700	1 300	2,550
250	1 300	650	2 150	1 100	1,500
200	1 200	600	1 600	800	0,770
150	1 000	500	1 300	650	0,420
100	1 000	500	500	300	0,075
75	800	400	450	300	0,054



THRUST BLOCK FOR 22,5° BEND

NOMINAL DIAMETER Ø (mm)	DIMENSIONS				
	D (mm)	Z (mm)	X (mm)	Y (mm)	VOL. (m³)
300	1 400	700	1 000	500	0,350
250	1 300	650	760	400	0,200
200	1 200	600	600	400	0,150
150	1 000	500	500	300	0,075
100	1 000	400	300	200	0,024
75	800	300	300	200	0,018

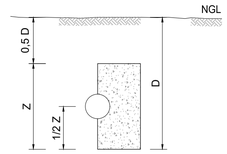


THRUST BLOCK FOR 90° BEND

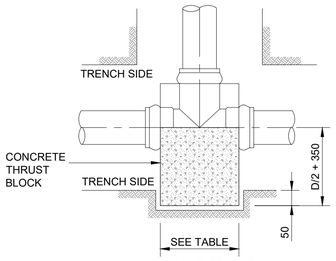
NOMINAL DIAMETER Ø (mm)	DIMENSIONS				
	D (mm)	Z (mm)	X (mm)	Y (mm)	VOL. (m³)
300	1 400	700	2 700	1 400	5,00
250	1 300	650	2 150	1 100	3,00
200	1 200	600	1 600	800	1,54
150	1 000	500	1 300	700	0,80
100	1 000	500	500	300	0,12
75	800	400	450	300	0,08

NOTES:

1. THIS TABLE WAS CALCULATED FOR ANCHOR BLOCKS IN SANDY SOILS.
2. USE 10MPa CONCRETE.
3. HALF THE DEPTH OF THE ANCHOR BLOCK NEEDS TO BE BELOW THE PIPE AXIS.
4. KEEP THE CONCRETE AWAY FROM THE COUPLINGS & THE PIPE JOINTS.
5. ANCHOR BLOCKS FOR PIPE Ø LARGER THAN 300mm & HIGHER TEST PRESSURES THAN 18 BAR NEEDS TO BE DESIGNED BY THE ENGINEER.
6. ANCHOR BLOCKS AT PADDLE FLANGES NEEDS TO BE REINFORCED & DESIGNED BY THE ENGINEER.
7. IN CASES OF SOFT CLAY & SILTY SANDS, THE ANCHOR BLOCKS NEED TO BE DESIGNED BY THE ENGINEER.



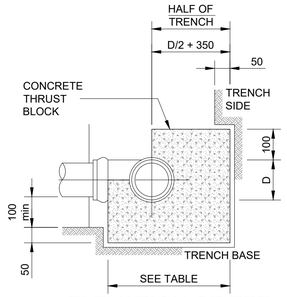
SECTION



PLAN OF TEE

EXAMPLE SHOWS A
110 EQUAL TEE

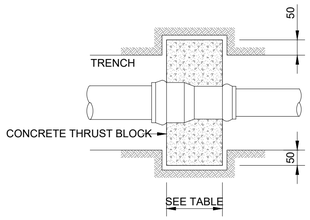
SCALE 1 : 10



ELEVATION OF TEE

EXAMPLE SHOWS
A 110 EQUAL TEE

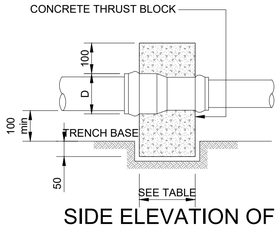
SCALE 1 : 10



PLAN OF REDUCER

EXAMPLE SHOWS A 110
TO 90 REDUCER

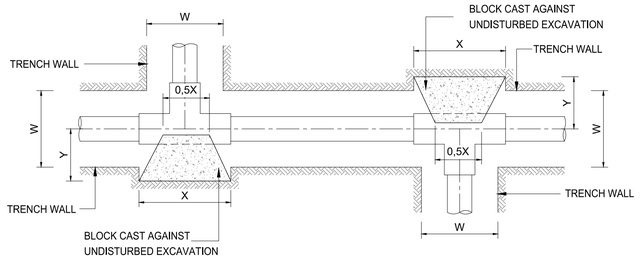
SCALE 1 : 10



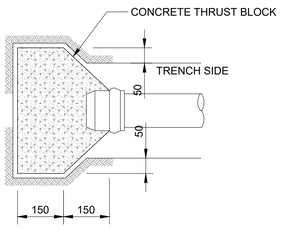
SIDE ELEVATION OF REDUCER

EXAMPLE SHOWS A 110
TO 90 REDUCER

SCALE 1 : 10



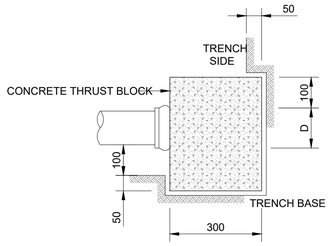
THRUST BLOCK FOR TEE



PLAN OF END CAP

EXAMPLE SHOWS
A 110 END CAP

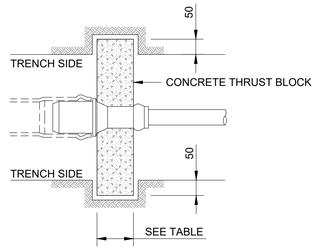
SCALE 1 : 10



ELEVATION OF END CAP

EXAMPLE SHOWS
A 110 END CAP

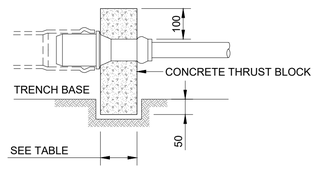
SCALE 1 : 10



PLAN OF REDUCER BUSH

EXAMPLE SHOWS A 110
TO 50 REDUCER BUSH

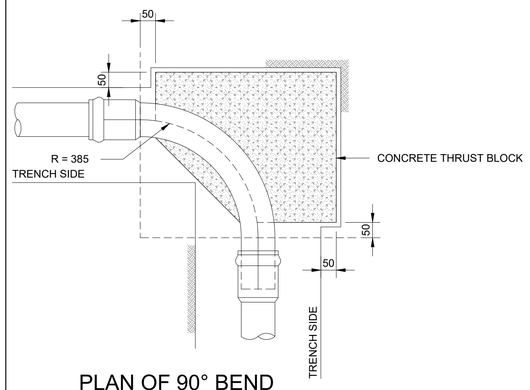
SCALE 1 : 10



SIDE ELEVATION OF REDUCER BUSH

EXAMPLE SHOWS A 110
TO 50 REDUCER BUSH

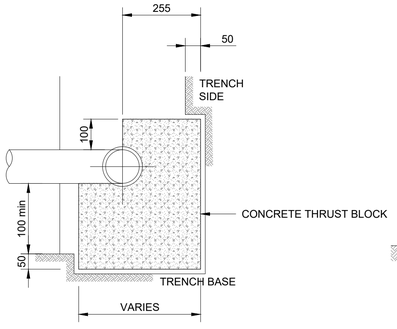
SCALE 1 : 10



PLAN OF 90° BEND

EXAMPLE SHOWS
A 110 90° BEND

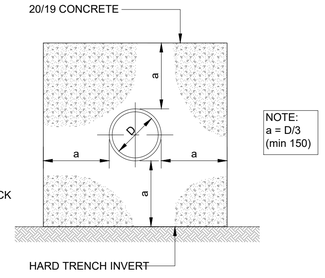
SCALE 1 : 10



SIDE ELEVATION OF 90° BEND

EXAMPLE SHOWS
A 110 90° BEND

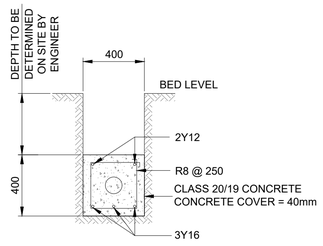
SCALE 1 : 10



NOTE:
a = D/3
(min 150)

CONCRETE ENCASING DETAILS

NOT TO SCALE



RIVERCROSSING REINFORCEMENT DETAIL

SCALE 1 : 10

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REV	DATE	COMMENTS	BY
A	20/08/24	ISSUED FOR INFORMATION	S.D

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0470
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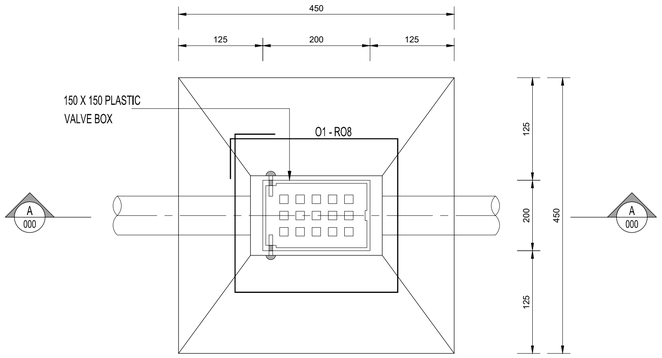
Project:
MOUTSE EAST & WEST WATER RETICULATION - PHASE 2

Drawing Title:
TYPICAL THRUST BLOCKS DETAILS

Consultant's Signature:
P. LOUW .....Pr TECH (ENG)

Drawn:	Checked:	Designed:	Scale:
S. DLAMINI	R. KHOROMBI	P. LOUW	AS SHOWN

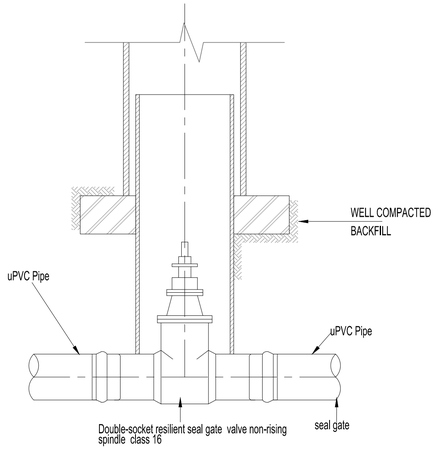
Job Number:	Discipline:	Dwg Number:	Rev:	Dwg Size:
20XXXX-LP-W	CIV	501	A	A1



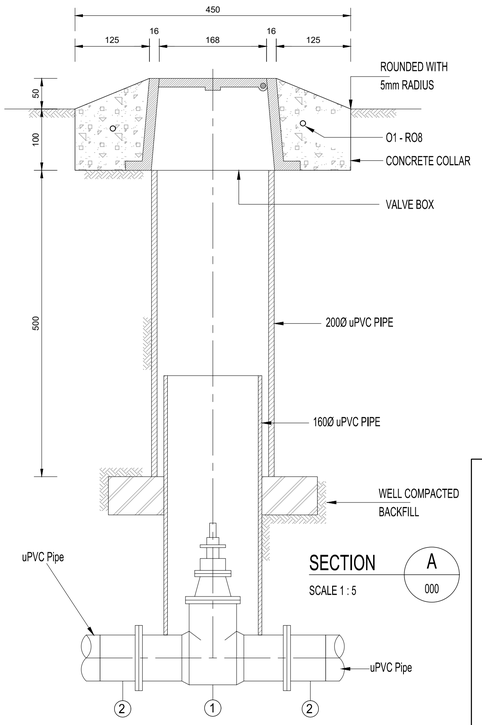
B 000

PLAN
VALVE BOX
SCALE 1 : 5

PIPE SCHEDULE		
Item No	Description	No. off
1	Flanged Resilient Seal Gate valve with non rising spindle to SABS 664 class 16 (anti-clockwise)	1
2	SG iron flange adapter to connect uPVC to galvanized pipework	2



VALVE
DOUBLE-SOCKETED PIPE ARRANGEMENT
SCALE 1 : 5

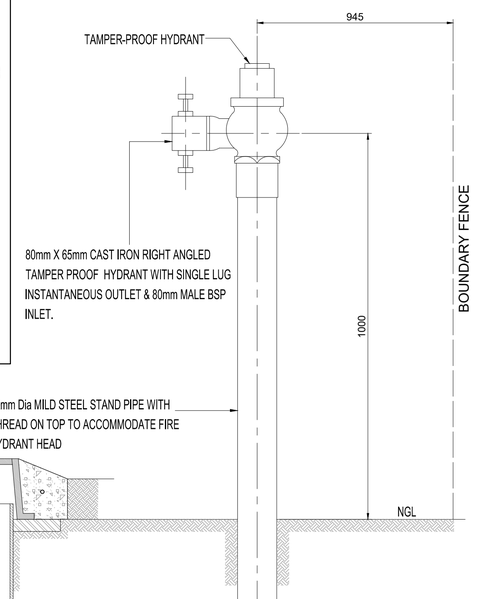


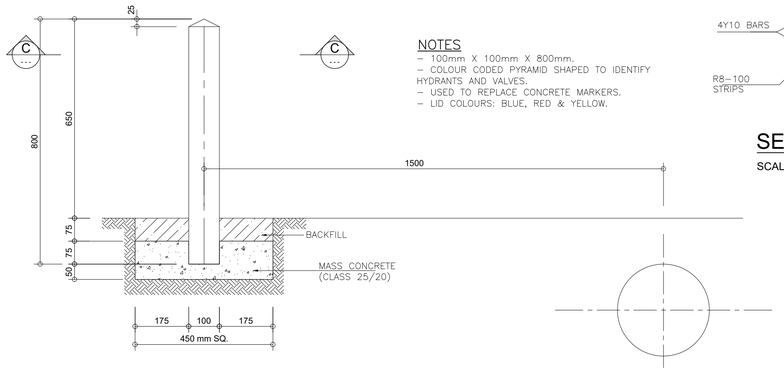
SECTION A 000
SCALE 1 : 5

VALVE
DOUBLE-FLANGED PIPE ARRANGEMENT
SCALE 1 : 5

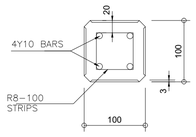
NOTES:

1. HYDRANTS MUST BE LOCATED IN COLLABORATION WITH THE CITY ELECTRICAL ENGINEERS DEPARTMENT SO THAT THEIR POSITIONS DO NOT COINCIDE WITH THOSE SELECTED FOR ELECTRICAL HOUSE CONNECTION BOXES.
2. ALL THREADED CONNECTIONS BELOW GROUND MUST BE TAPED WITH DENSOTAPE OR SIMILAR.
3. THE LETTER 'FH' IS TO BE FORMED IN THE CONCRETE KERB WITH YELLOW COLOR.



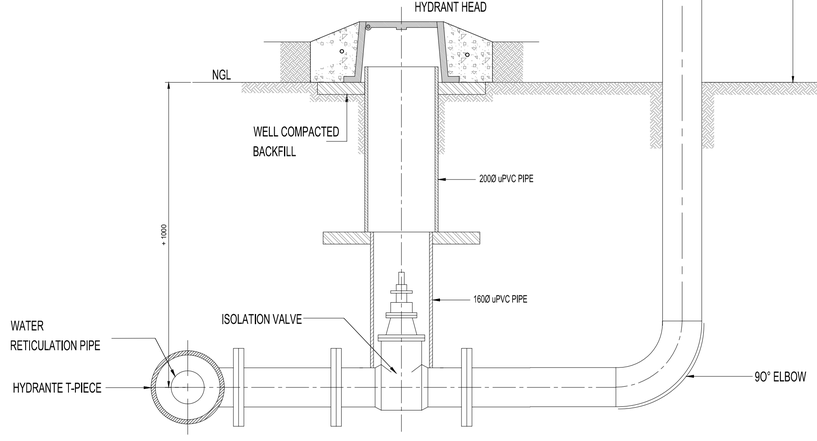


NOTES
- 100mm X 100mm X 800mm.
- COLOUR CODED PYRAMID SHAPED TO IDENTIFY HYDRANTS AND VALVES.
- USED TO REPLACE CONCRETE MARKERS.
- LID COLOURS: BLUE, RED & YELLOW.



SECTION C-C
SCALE 1 : 5

FIRE HYDRANT MARKER
SCALE 1 : 10



FIRE HYDRANT DETAIL
N.T.S

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A	20/08/24	ISSUED FOR INFORMATION	S.D

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Project:
MOUTSE EAST & WEST WATER RETICULATION - PHASE 2

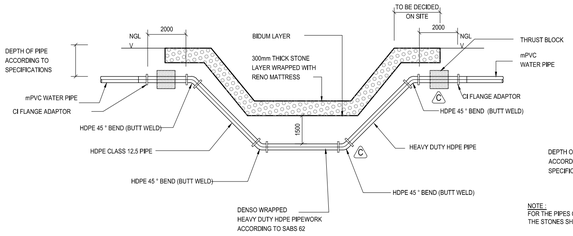
Drawing Title:
VALVES,FIRE HYDRANT & MARKER DETAILS.

Consultant's Signature:

P. LOUW .....Pr TECH (ENG)

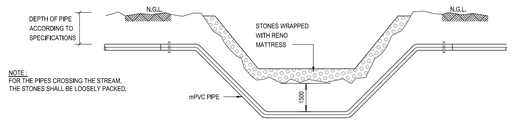
Drawn:	Checked:	Designed:	Scale:
S. DLAMINI	R. KHOROMBI	P. LOUW	AS SHOWN

Job Number:	Discipline:	Dwg Number:	Rev:	Dwg Size:
20XXXX-LP-W	CIV	502	A	A1



SECTION A FOR A RIVER CROSSING

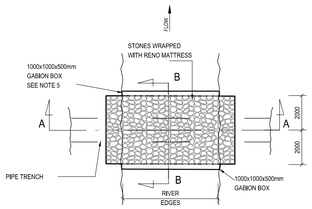
N.T.S.



NOTE :
FOR THE PIPES CROSSING THE STREAM, THE STONES SHALL BE LOOSELY PACKED.

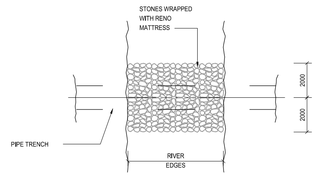
SECTION OF A STREAM CROSSING

N.T.S.



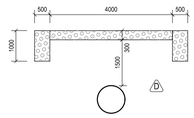
PLAN FOR A RIVER CROSSING

N.T.S.



PLAN OF A STREAM CROSSING

N.T.S.



SECTION B FOR A RIVER CROSSING

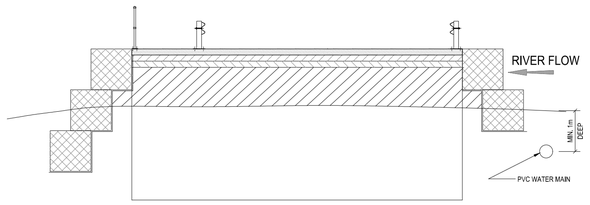
SCALE 1:50

NOTES:

1. FOR THE PIPES CROSSING THE STREAM, THE STONES SHALL BE LOOSELY PACKED.
2. ALL FLANGES TO BE DRILLED ACCORDING TO SABS 1123 TABLE 1600.
3. ALL HDPE PIPEWORK IN ACCORDENCE WITH SABS 62, AND DENSO WRAPPED.
4. ALL CONCRETE TO BE 20MPa.
5. 1x1x0.5m GABION BOX TO BE PROVIDED ON INSTRUCTION OF THE RESIDENT ENGINEER.
6. ALL PIPEWORK TO BE TESTED BEFORE DENSO-WRAPPED AND INSTALLED.

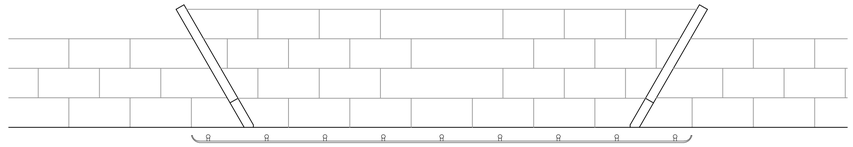
PIPE SIZE mm	MAX. WORKING PRESSURE(bar) SABS 62 (Heavy)
50	17
65	17
80	17
100	14
125	14
150	10.5

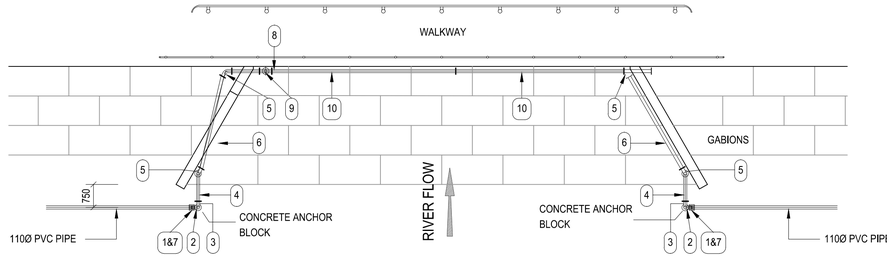
NOTE: TEST PIPEWORK FOR LEAKAGE BEFORE BACKFILL.



SECTION THROUGH GABION PROTECTED LOW-WATER ROAD CROSSING

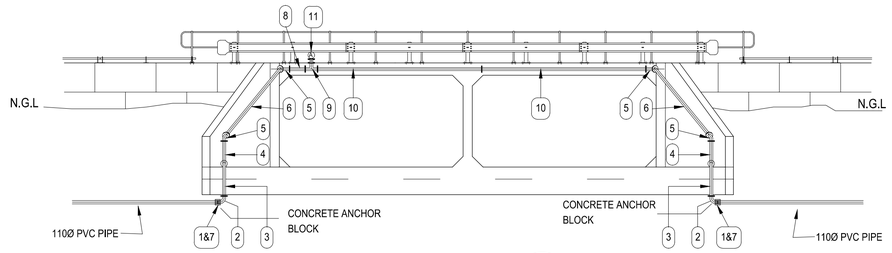
SCALE 1 : 50





PLAN

SCALE 1 : 100

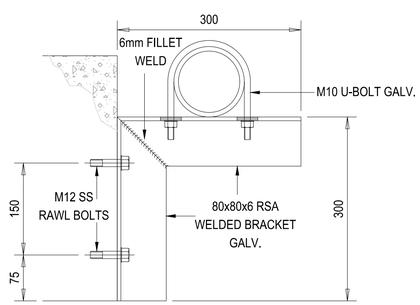


ELEVATION B

SCALE 1:100

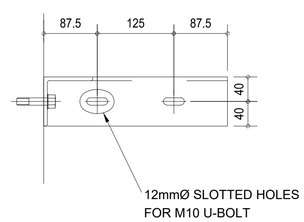
ITEM	NO	DESCRIPTION	DIMENSIONS	ITEM	NO	DESCRIPTION	DIMENSIONS
1	2	FLEXIBLE FLANGE ADAPTOR COUPLING (VJ OR SIMILAR APPROVED)	STANDARD	8	1	100Ø GALV. MS FLANGED STRAIGHT.	510, 100Ø
2	2	100Ø x 90° GALV. MS BEND ONE END FLANGED, OTHER SUITABLE FOR VJ COUPLING	200, 200, 100Ø	9	1	100Ø x 50Ø GALV. MS T-PIECE FLANGED	50Ø, 200, 100Ø, 400
3	2	100Ø x 90° GALV. MS FLANGED UNEQUAL BEND	1052, 300, 100Ø	10	2 To suit bridge or culvert span	100Ø GALV. MS PIPE ONE END FLANGED THE OTHER END SUPPLIED WITH LOOSE FLANGE CONFIRM LENGTH ON SITE	6000, 100Ø, CUT TO SUIT ON SITE
4	2	100Ø x 90° GALV. MS FLANGED UNEQUAL BEND	740, 300, 100Ø	11	1 supply and install steel cage	AIR VALVE (VENT-O-MAT) 050 RB X 25 1.1 WITH ISOLATING BALL VALVE & FLANGE OR SIMILAR APPROVED	A
5	4	100Ø x 60° GALV. MS FLANGED BEND	150, 100Ø, 120°, 120°				
6	2	100Ø GALV. MS FLANGED STRAIGHT WITH LOOSE FLANGE, CUT ANGLE TO SUIT HORIZONTAL SITE INSTALLATION AT LOOSE FLANGE	3000, 100Ø, CUT TO SUIT ON SITE				
7	2	100Ø CI FLANGE ADAPTOR TO CONNECT PVC TO GALV. PIPE WORK	STANDARD				

NOTE : ALL LENGTHS MUST BE CONFIRMED AND FINALISED ON SITE.
DIMENTIONS ARE PROVISIONAL



SIDE ELEVATION : PIPE BRACKET

SCALE 1 : 5



PLAN : PIPE BRACKET

SCALE 1 : 5

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REV	DATE	COMMENTS	BY
A	20/08/24	ISSUED FOR INFORMATION	S.D

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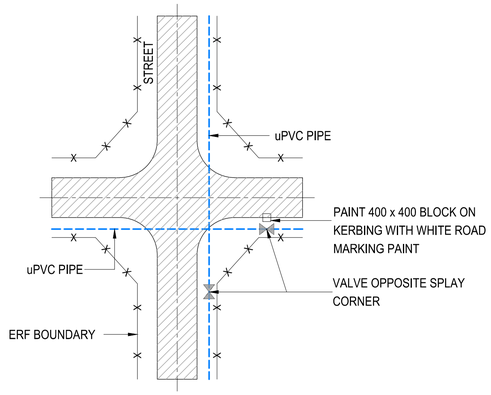
Project:
MOUTSE EAST & WEST WATER RETICULATION - PHASE 2

Drawing Title:
TYPICAL DETAILS RIVERS & STREAM CROSSING

Consultant's Signature:
P. LOUW .....Pr TECH (ENG)

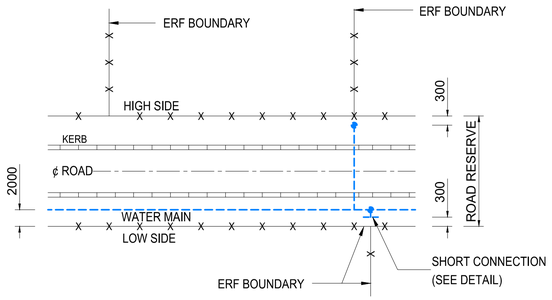
Drawn:	Checked:	Designed:	Scale:
S. DLAMINI	R. KHOROMBI	P. LOUW	AS SHOWN

Job Number:	Discipline:	Dwg Number:	Rev:	Dwg Size:
201651-LP-W	CIV	503	A	A1



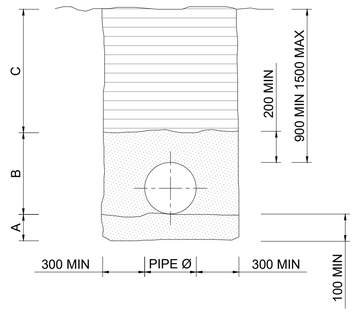
PIPE & VALVES AT INTERSECTION

NOT TO SCALE



PLAN
ROAD RESERVE

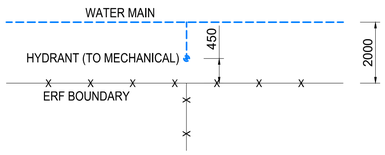
NOT TO SCALE



A: SELECTED BEDDING LAYER (UNCOMPACTED)
B: SELECTED BACK FILL (AGGREGATE MAX 10mm)
C: BACK FILL (COMPACTED)

TYPICAL CROSS SECTION OF PIPE TRENCH

NOT TO SCALE

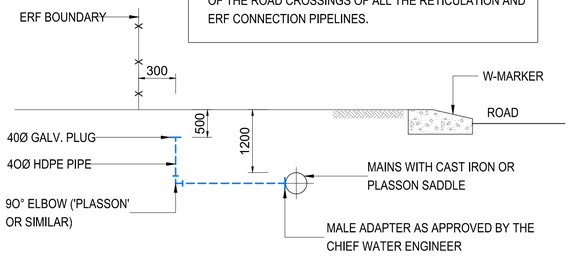


HYDRANT LOCATION

NOT TO SCALE

NOTES:

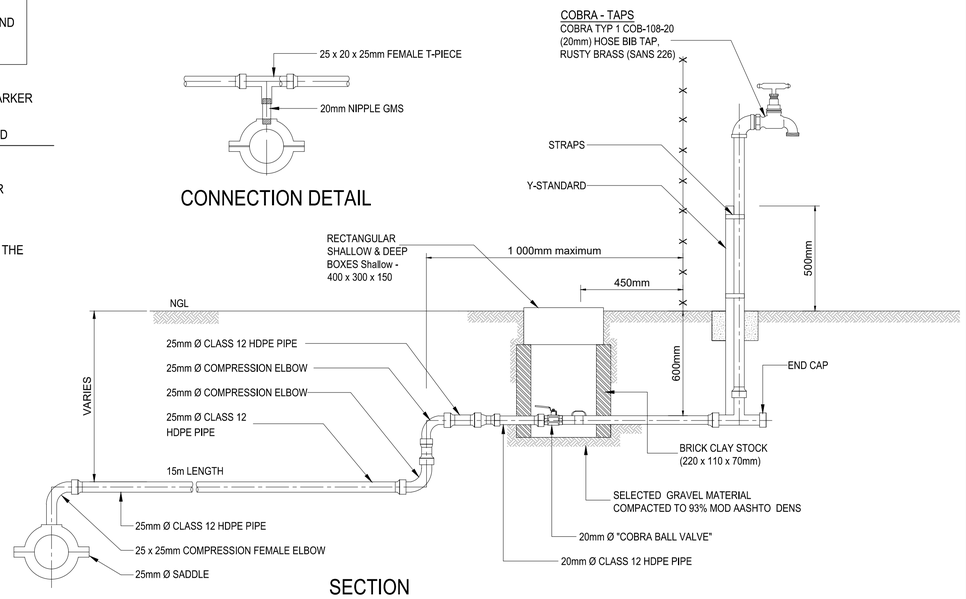
1. THE LETTER 'W' IS TO BE FORMED IN THE CONCRETE KERB BEFORE IT HAS SET, TO IDENTIFY THE POSITIONS OF THE ROAD CROSSINGS OF ALL THE RETICULATION AND ERF CONNECTION PIPELINES.



SECTION
SHORT CONNECTION

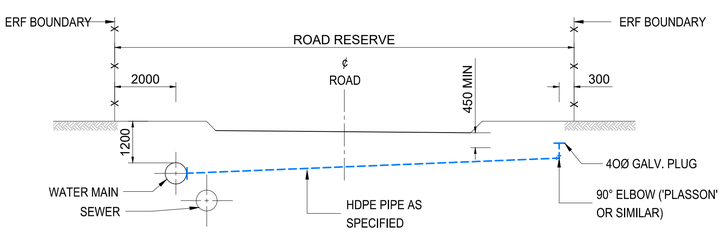
NOT TO SCALE

CONNECTION DETAIL



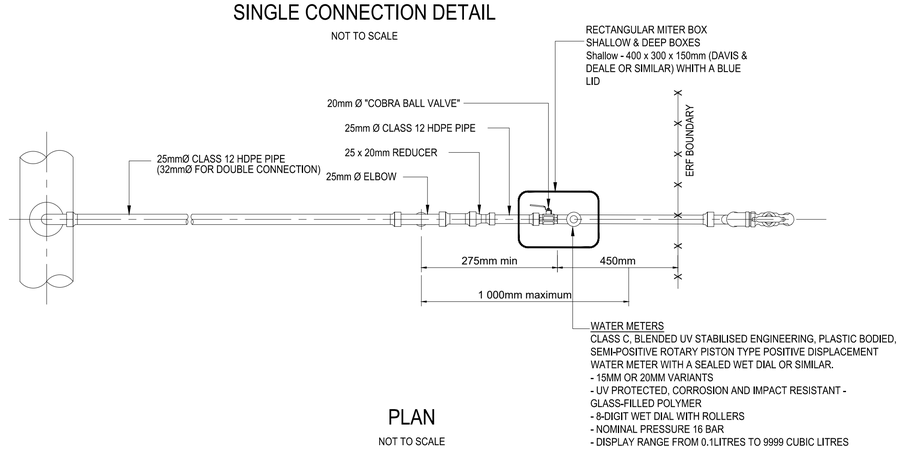
SECTION
SINGLE CONNECTION DETAIL

NOT TO SCALE



SECTION
LONG CONNECTION

NOT TO SCALE



WATER METERS
CLASS C, BLENDED UV STABILISED ENGINEERING, PLASTIC BODIED, SEMI-POSITIVE ROTARY PISTON TYPE POSITIVE DISPLACEMENT WATER METER WITH A SEALED WET DIAL OR SIMILAR.
- 15MM OR 20MM VARIANTS
- UV PROTECTED, CORROSION AND IMPACT RESISTANT - GLASS-FILLED POLYMER
- 8-DIGIT WET DIAL WITH ROLLERS
- NOMINAL PRESSURE 16 BAR
- DISPLAY RANGE FROM 0.1LITRES TO 9999 CUBIC LITRES

PLAN

NOT TO SCALE

CONNECTION FOR SINGLE

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Fax: 013 262 2524

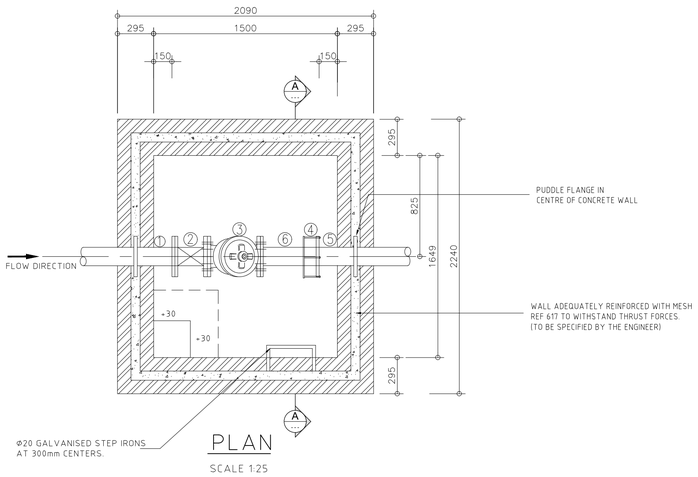
Project:
MOUTSE EAST & WEST WATER RETICULATION - PHASE 2

Drawing Title:
TYPICAL PLACEMENT OF VALVES & HOUSE CONNECTION DETAIL

Consultant's Signature:
P. LOUW .....Pr TECH (ENG)

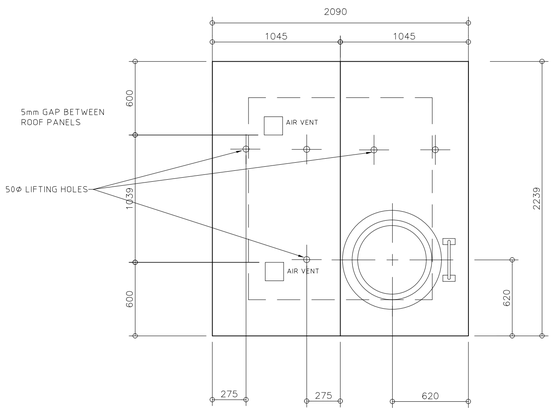
Drawn:	Checked:	Designed:	Scale:
S. DLAMINI	R. KHOROMBI	P. LOUW	AS SHOWN

Job Number:	Discipline:	Dwg Number:	Rev:	Dwg Size:
20XXXX-LP-W	CIV	504	A	A1



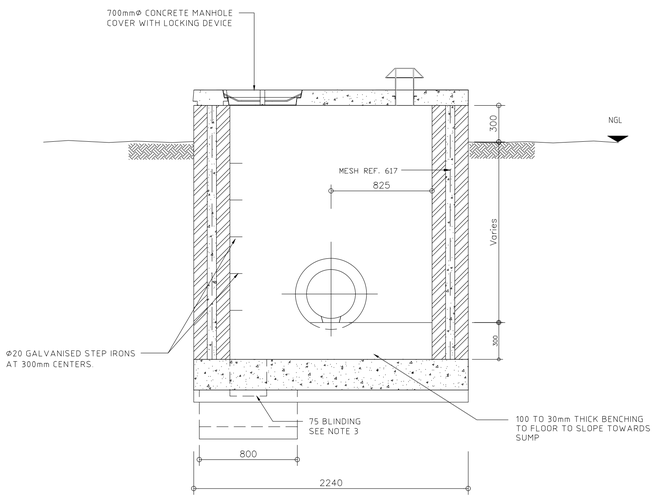
PLAN

SCALE 1:25



ROOF PLAN

SCALE 1:25



SECTION A-A

SCALE 1 : 20

TYPICAL STEEL PIPE FITTINGS AND ITEM LIST

(150ND PIPE LINE USED AS AN EXAMPLE)

ITEM NR.	DESCRIPTION	NO. OFF	DIMENSIONS
1	PIPE SPECIAL 150Φ STEEL PIPE, ONE END FLANGED OTHER END SUITABLE FOR FLANGE ADAPTOR WITH PUDDLE FLANGE IN POSITION AS INDICATED. FLANGES TO SABS 1123	1	840, 420, 150Φ
2	150Φ RSV GATE VALVE (PN16) WITH HANDWHEEL AND ANTI-CLOCKWISE CLOSING TO SABS 664. BOTH ENDS FLANGED TO SABS 1123 - 1600/3.	1	150Φ, 435
3	150Φ BERMAD WW-700 OR SIMILAR FLAT DISK PRESSURE REDUCING VALVE COMPLETE, PN25. ENDS FLANGED TO SABS 1123 - 2500/3.	1	515, 150Φ
4	150 ND "VIKING JOHNSON" FLANGE ADAPTOR COUPLING	1	2500/3
5	PIPE SPECIAL 150Φ STEEL PIPE, ONE END FLANGED OTHER END SUITABLE FOR FLANGE ADAPTOR WITH PUDDLE FLANGE IN POSITION AS INDICATED. FLANGES TO SABS 1123	1	840, 420, 150Φ
6	150Φ STEEL PIPE, ONE END FLANGED OTHER END SUITABLE FOR FLANGE ADAPTOR WITH PUDDLE FLANGE IN POSITION AS INDICATED. FLANGES TO SABS 1123	1	250, 150Φ

TYPICAL STEEL PIPE FITTINGS AND ITEM LIST

(100ND PIPE LINE USED AS AN EXAMPLE)

ITEM NR.	DESCRIPTION	NO. OFF	DIMENSIONS
1	PIPE SPECIAL STEEL PIPE WITH BOTH ENDS FLANGED, 6mm WALL THICKNESS PUDDLE FLANGE AS INDICATED	1	840, 420, 100Φ
2	100Φ RSV GATE VALVE (PN16) WITH HANDWHEEL AND ANTI-CLOCKWISE CLOSING TO SABS 664. BOTH ENDS FLANGED TO SABS 1123 - 1600/3.	1	100Φ, 635
3	100Φ BERMAD WW-700 OR SIMILAR FLAT DISK PRESSURE REDUCING VALVE COMPLETE, PN25. ENDS FLANGED TO SABS 1123 - 2500/3.	1	435, 100Φ
4	100 ND "VIKING JOHNSON" FLANGE ADAPTOR COUPLING	1	2500/3
5	PIPE SPECIAL 100Φ STEEL PIPE, ONE END FLANGED OTHER END SUITABLE FOR FLANGE ADAPTOR WITH PUDDLE FLANGE IN POSITION AS INDICATED. FLANGES TO SABS 1123	1	840, 420, 100Φ
6	PIPE SPECIAL 100Φ STEEL PIPE, ONE END FLANGED OTHER END SUITABLE FOR FLANGE ADAPTOR WITH PUDDLE FLANGE IN POSITION AS INDICATED. FLANGES TO SABS 1123	1	250, 100Φ

TYPICAL STEEL PIPE FITTINGS AND ITEM LIST

(65ND PIPE LINE USED AS AN EXAMPLE)

ITEM NR.	DESCRIPTION	NO. OFF	DIMENSIONS
1	PIPE SPECIAL STEEL PIPE WITH BOTH ENDS FLANGED, 6mm WALL THICKNESS PUDDLE FLANGE AS INDICATED	1	840, 420, 65Φ
2	65Φ RSV GATE VALVE (PN16) WITH HANDWHEEL AND ANTI-CLOCKWISE CLOSING TO SABS 664. BOTH ENDS FLANGED TO SABS 1123 - 1600/3.	1	65Φ, 635
3	65Φ BERMAD WW-700 OR SIMILAR FLAT DISK PRESSURE REDUCING VALVE COMPLETE, PN25. ENDS FLANGED TO SABS 1123 - 2500/3.	1	435, 65Φ
4	65 ND "VIKING JOHNSON" FLANGE ADAPTOR COUPLING	1	2500/3
5	PIPE SPECIAL 65Φ STEEL PIPE, ONE END FLANGED OTHER END SUITABLE FOR FLANGE ADAPTOR WITH PUDDLE FLANGE IN POSITION AS INDICATED. FLANGES TO SABS 1123	1	840, 420, 65Φ
6	PIPE SPECIAL 65Φ STEEL PIPE, ONE END FLANGED OTHER END SUITABLE FOR FLANGE ADAPTOR WITH PUDDLE FLANGE IN POSITION AS INDICATED. FLANGES TO SABS 1123	1	250, 65Φ

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NOTES

1. CONCRETE
   - STRUCTURAL TO BE GRADE 25/19
   - BLINDING TO BE 15/19
   - BENCHING TO BE 1:4 CEMENT:SAND SCREED
2. CHAMBER TO BE WATERTIGHT
3. 75mm BLINDING UNDER ALL FOUNDATIONS
4. CONCRETE FINISHES
   - ALL EXPOSED CONCRETE EDGES TO HAVE 20x20mm CHAMFER
   - SMOOTH OFF-SHUTTER TO EXPOSED VERTICAL FACES
   - ROUGH OFF-SHUTTER TO UNEXPOSED VERTICAL FACES
   - WOOD FLOAT TO TOP OF WALLS AND ROOF SLAB
   - STEEL FLOAT TO TOP OF FLOOR BENCHING
5. 6mm RUBBER INSERTION BETWEEN VALVE FEET & CONCRETE PLINTH
6. ALL METALWORK TO BE HOT DIP GALVANISED TO ISO 1461
7. FLANGES TO SABS 1123-1977 - PN 16

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Fax: 013 262 2524

Project:

MOUTSE EAST & WEST WATER RETICULATION - PHASE 2

Drawing Title:

TYPICAL DETAILS
PRESSURE REDUCING
VALVE CHAMBER DETAILS

Consultant's Signature:

P. LOUW .....Pr (ENG)

Drawn:	Checked:	Designed:	Scale:
S. DLAMINI	R. KHOROMBI	P. LOUW	AS SHOWN

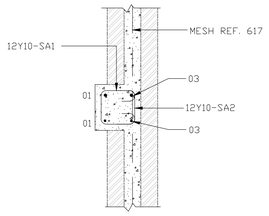
Job Number:	Discipline:	Dwg Number:	Rev:	Dwg Size:
201651-LP-W	CIV	505	A	A1

WALL STIFFNER SCHEDULE	
HEIGHT A (m)	REINFORCING
< 2.0	SEE DETAIL 1

CHAMBER ROOF SLAB SCHEDULE		
LENGTH C (m)	THICKNESS (mm)	REINFORCING
< 2.5	125	MESH REF. 617

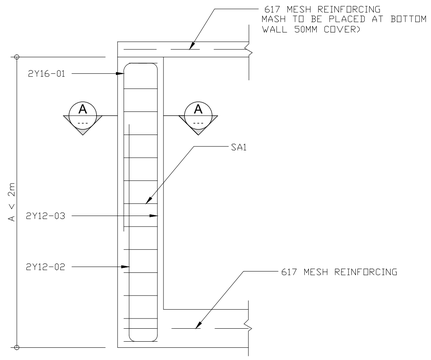
CHAMBER WALL SCHEDULE
NOTE: PROVIDE MESH REF. 617 IN ALL CONCRETE WALLS
CHAMBER WALLS = 330mm (2X 110mm BRICKWORK + 110mm CONCRETE)

CHAMBER WALL SCHEDULE

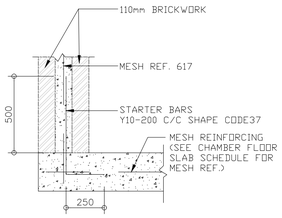


STIFFNER COLUMN TO BE PLACED AT 2.5M INTERVAL IF THE HEIGHT > 1.5M AND OR WALL > 2.5M

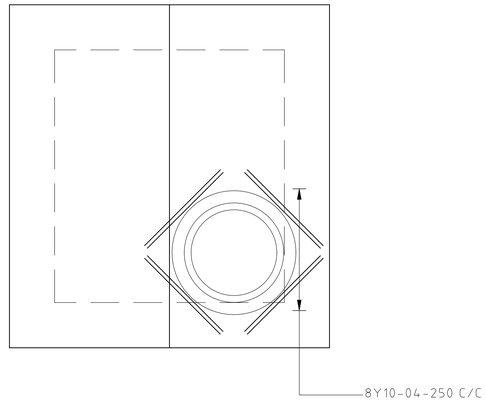
SECTION A-A
SCALE 1 : 20



DETAIL 1
SCALE 1 : 20



DETAIL 2
SCALE 1 : 20



ROOF SLAB OPENING

BENDING SCHEDULE

MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM-BER	MARK	S	C	BENDING A	B	C	D	E/r
<2m STIFFNER	1	2	Y16	1350	2	01	34		1200				
		2	Y12	1550	2	02	34		1420				
		2	Y12	2150	2	03	35		1920				
STIRRUPS		12	Y10	850	12	SA1	72		220	220			
		12	Y10	850	12	SA2	35		220				
ROOF SLAB OPENING		2	Y10	700		08	04		20	700			

NOTE: .....

Date	02/02/23
Det. by	NM
Ref Dwg	
Job No	.....
Revision	A
Schedule No	---

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NOTES:

REINFORCEMENT

1.1 ALL REINFORCEMENT TO BE CHECKED AND APPROVED BY THE ENGINEER BEFORE ANY CONCRETE IS CAST.

1.2 LAP LENGTH TO REINFORCING TO BE MIN. 50 x SMALLER DIAMETER, UNLESS OTHERWISE NOTED.

1.3 MINIMUM COVER TO REINFORCING:

STIFFNERS	50mm
WALLS.....	50mm
COLUMNS.....	50mm
FLOOR SLABS	50mm
ROOF SLABS	30mm

1.4 THE CONTRACTOR MUST TAKE PARTICULAR CARE TO ENSURE THAT THE SPECIFIED COVER TO ALL REINFORCEMENT HAS BEEN ATTAINED THROUGHOUT BEFORE THE ENGINEER IS CALLED TO SITE.

1.5 REINFORCING YIELD STRENGTH:

HIGH TENSILE 'Y'	450 MPa
MILD STEEL 'R'	250 MPa
WELDED STEEL WIRE MESH	485 MPa

1.6 BENDING AND SCHEDULING OF REINFORCEMENT SHALL BE IN ACCORDANCE WITH SANS 282:2004

1.7 ABBREVIATIONS:

T1 - HIGHEST TOP LAYER
T2 - SECOND TOP LAYER
T3 - THIRD TOP LAYER
B1 - LOWEST BOTTOM LAYER
B2 - SECOND BOTTOM LAYER
B3 - THIRD BOTTOM LAYER
EF - EACH FACE
NF - NEAR FACE
FF - FAR FACE
EW - EACH WAY
ALT - ALTERNATE BARS
ABR - ALTERNATE BARS REVERSED
STG - ALTERNATE BAR STAGGERED

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Fax: 013 262 2524

Project:
MOUTSE EAST & WEST WATER RETICULATION - PHASE 2

Drawing Title:
CHAMBER ROOF AND FLOOR SLABS, STIFFNERS AND WALL REINFORCEMENT

Consultant's Signature:
P. LOUW .....Pr (ENG)

Drawn:	Checked:	Designed:	Scale:
S. DLAMINI	R. KHOROMBI	P. LOUW	AS SHOWN

Job Number:	Discipline:	Dwg Number:	Rev:	Dwg Size:
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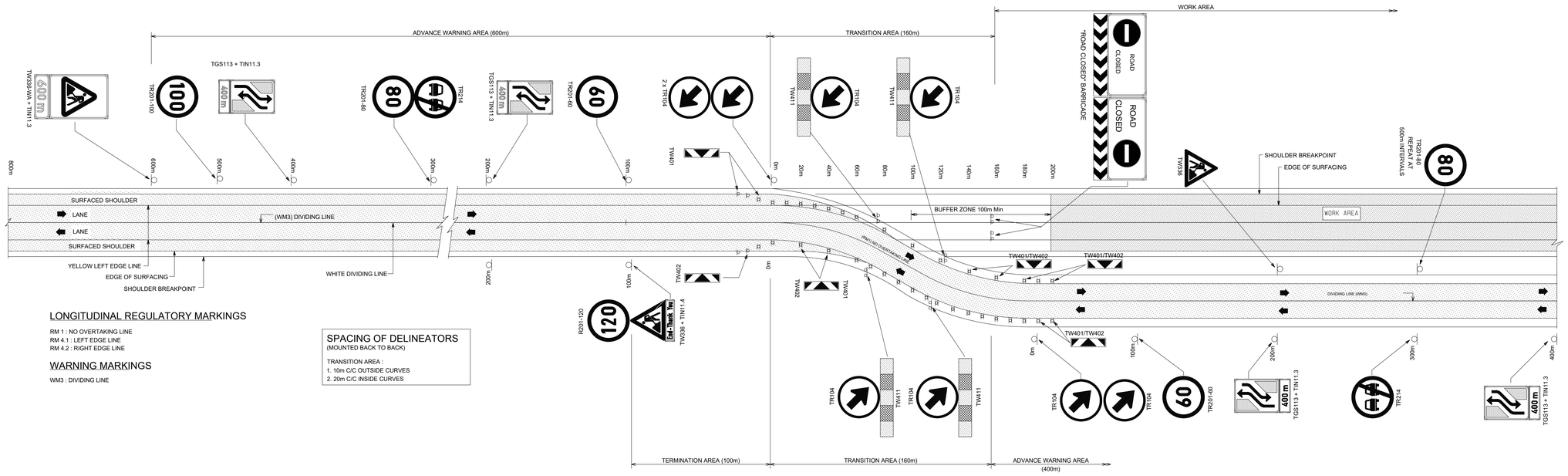


LONGITUDINAL REGULATORY MARKINGS

RM 1 : NO OVERTAKING LINE
RM 4.1 : LEFT EDGE LINE
RM 4.2 : RIGHT EDGE LINE

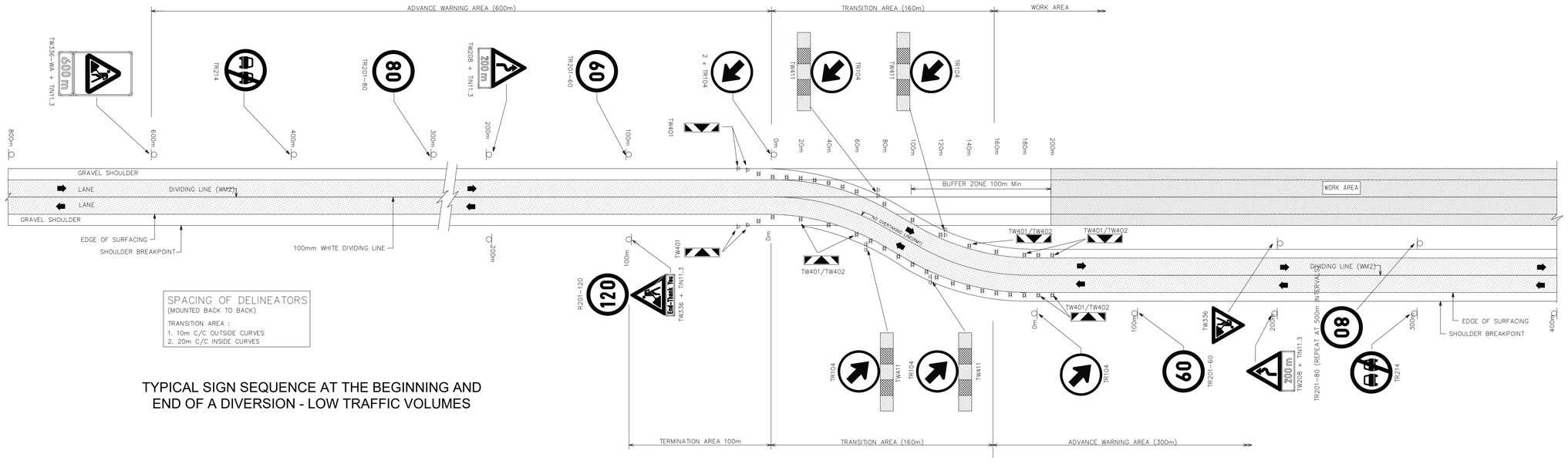
WARNING MARKINGS

WM3 : DIVIDING LINE

SPACING OF DELINEATORS
(MOUNTED BACK TO BACK)

TRANSITION AREA :
1. 10m C/C OUTSIDE CURVES
2. 20m C/C INSIDE CURVES

TYPICAL ROAD SIGN SEQUENCE AT THE BEGINNING AND END OF A DIVERSION - HIGH TRAFFIC VOLUMES



SPACING OF DELINEATORS
(MOUNTED BACK TO BACK)

TRANSITION AREA :
1. 10m C/C OUTSIDE CURVES
2. 20m C/C INSIDE CURVES

TYPICAL SIGN SEQUENCE AT THE BEGINNING AND END OF A DIVERSION - LOW TRAFFIC VOLUMES

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4. ALL WATERPROOFING AND EARTH POISONING DETAILS TO BE IN ACCORDANCE WITH THE ARCHITECT'S SPECIFICATION AND INSTRUCTIONS.

REV	DATE	COMMENTS	BY
A	20/08/24	ISSUED FOR INFORMATION	S.D

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Tel: 013 262 7300
Fax: 013 262 2524

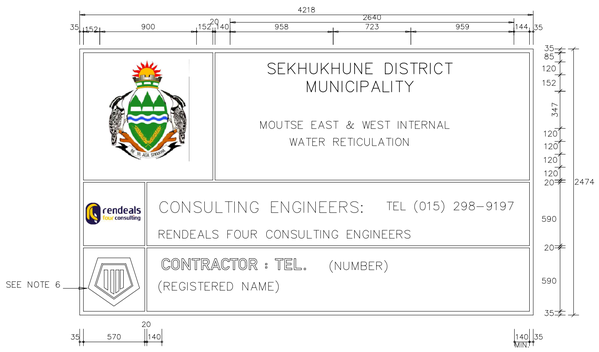
Project:
MOUTSE EAST & WEST WATER RETICULATION - PHASE 2

Drawing Title:
TYPICAL TEMPORARY ROAD SIGNAGE FOR TRAFFIC MANAGEMENT PLAN

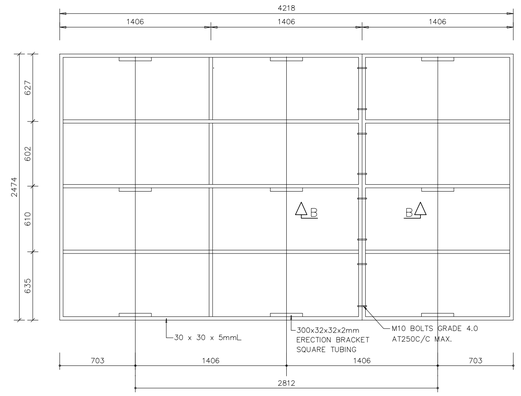
Consultant's Signature:
P. LOUW.....(Pr. ENG)

Drawn:	Checked:	Designed:	Scale:
S. DLAMINI	R.KHOROMBI	P. LOUW	N.T.S

Job Number:	Discipline:	Dwg Number:	Rev:	Dwg Size:
201651-LP-W	CIV	507	A	A1



FRONT ELEVATION



REAR SIDE BRACING

NOTES:

EMBLEME:

1. ALL EMBLEMS TO BE DISPLAYED IN FULL COLOUR ON A SEMI-MATT BACKGROUND.

LETTERS AND NUMBERS:

2. DESCRIPTION : MATT-BLACK, SERIES DIN B LETTERS AND NUMBERS ON A SEMI-MATT SMOKE-GREY BACKGROUND.

BORDERS:

3. BORDER : GREEN NON-REFLECTORIZED.

QUANTITY:

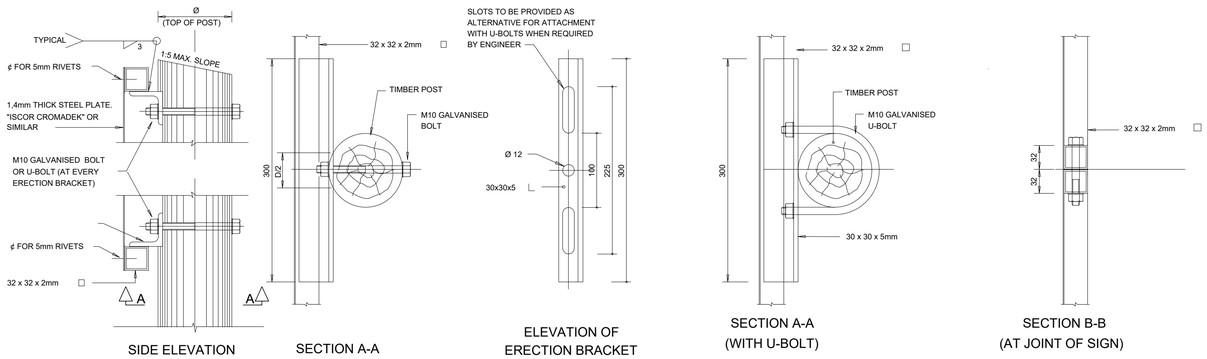
4. TWO SIGN BOARDS, SHALL BE ERECTED AT POSITIONS AS DETERMINED BY THE ENGINEER.

DESCRIPTION:

5. DESCRIPTION OF WORK (NUMBER OF KILOMETRES AND TYPE OF WORK, eg."13.5km RECONSTRUCTION OF ROAD 197A." DESCRIPTION STARTS CENTERED ON THE LEFT-HAND SIDE AND THE FIRST 105mm-DIMENSION BELOW "NORTHERN"

6. SAFCEC EMBLEM ONLY IF CONTRACTOR IS A MEMBER OTHERWISE BLANK.

7. NEW SAACE LOGO TO BE OBTAINED FROM SAACE, JOHANNESBURG.



SIDE ELEVATION

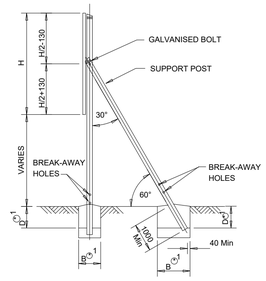
SECTION A-A

ELEVATION OF
ERECTION BRACKET

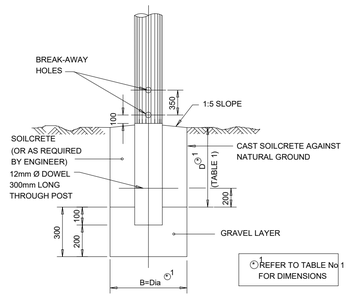
SECTION A-A
(WITH U-BOLT)

SECTION B-B
(AT JOINT OF SIGN)

FIXING DETAIL FOR SIGN BOARDS



SIDE ELEVATION OF ROAD SIGN



FOUNDATION DETAIL

DETERMINATION OF BREAK-AWAY HOLES	
POLE DIA (mm)	HOLE DIA (mm)
< 140	NONE
141 - 170	40
171 - 200	50
201 - 225	65

TABLE 1: DETERMINATION OF POSTS & FOOTINGS				
ERECTION DETAILS				
TYPE OF POST	UPRIGHT	STAY	D	B(DIA)
TIMBER POST AND STAY	100mm	80mm	600mm	850mm
TIMBER POST	180mm	- 1000mm	1450mm	
D SECTION STEEL POST	100mm x 4mm	-	1000mm	1450mm

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REV	DATE	COMMENTS	BY
0	31/01/24	ISSUED FOR CONSTRUCTION	P.L
A	02/05/23	ISSUED FOR INFORMATION	T.M.

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MOUTSE EAST & WEST WATER RETICULATION

Drawing Title:

NAME BOARD

Consultant's Signature:

P. LOUW.....(Pr. ENG)

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