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

GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

Reference no: SK8/3/1-06/2023/24

A Tender for Category 8CE or higher CIDB Registered Contractors

29 MAY 2023

ISSUED BY:	PREPARED BY:
Sekhukhune District Municipality Private Bag X8611 Groblersdal 0470 Contact Person: Mr Voster Masemola Supply Chain Management Telephone: 013 262 7656	HWA Engineers & Project Managers P.O Box 3472 Polokwane 0700 Tel: 015 297 5906 Fax: 086 246 0744 Email: admin@hwaeng.co.za

Registered Name of Bidder:	
Trading Name of Bidder:	
Registration No. of Entity:	
Postal Address of Bidder:	
Contact Person:	
Tel. No:	E-mail Address:
Cell No.	Fax No:
CIDB CRS Number(s):	
Tender Amount	
CSD Number:	
EXPANDED PUBLIC WORKS PROGRAMME Creating opportunities towards human fulfilment	mig | Municipal Infrastructure Grant

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

DESCRIPTION		COLOUR
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	C3.6 PARTICULAR SPECIFICATIONS AND ADDITIONS TO THE STANDARD SPECIFICATIONS	Pale Blue
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T1.1 Tender Notice and Invitation to Tender

INVITATION TO BID MBD1

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE SEKHUKHUNE DISTRICT MUNICIPALITY					
BID NUMBER:	**SK8/3/1- 06/2023/24**	CLOSING DATE:	**04/07/2023**	CLOSING TIME:	**11h00**
DESCRIPTION	GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD7) or SERVICE LEVEL AGREEMENT OF SEKHUKHUNE DISTRICT MUNICIPALITY.					
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT					
Groblersdal Fire Station, R33 Groblersdal 0470, No later than **11:00** on **04/07/2023.**					
There will be Compulsory briefing session at on **08 June 2023 at 11h00** . Tenders will be available on e-Tenders for free and/or at No 03 West, Groblersdal, 0470 on **08 June 2023** after **15h00** at a non-refundable fee of **R1000.00**					
The Bid box is generally open 24 hours, 7 days a week.					
Completed Bid document, fully priced and signed must be sealed in an envelope marked: "**SK8/3/1- 06/2023/24**-: GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C					
Bidders should ensure that bids are delivered timeously to the correct address. If the bid is late, it will not be accepted for consideration.					
It is a requirement of this project that the Tenderer sub-contract a minimum of 30% of the work to Community Based Sub-Contractors.Please note: that the value of the works excludes Vat, contingencies, Provisional sum and P & G					

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 7556	TELEPHONE NUMBER	013 262 7300
FACSIMILE NUMBER	013 262 7688	FACSIMILE NUMBER	013 262 7688
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:	MAAA

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]
MINIMUM WORK OPPORTUNITIES TO BE CREATED		CIDB GRADING	8CE OR HIGHER
SIGNATURE OF BIDDER	……	DATE	
CAPACITY UNDER WHICH THIS BID IS SIGNED			

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 SUPPLY CHAIN MANAGEMENT REGULATIONS, SEKHUKHUNE DISTRICT MUNICIPALITY SUPPLY CHAIN MANAGEMENT POLICY, 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.

NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE.

SIGNATURE OF BIDDER: ……

CAPACITY UNDER WHICH THIS BID IS SIGNED: ……
(Proof of authority must be submitted e.g., company resolution)

DATE: ……...

BID NUMBER: SK8/3/1- 06/2023/24-: GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

DIRECTORATE: INFRASTRUCTURE AND WATER SERVICES

BUSINESS UNIT: PMU

Bids are hereby invited for **GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C**

The **MUNICIPALITY** also reserves the right to negotiate further conditions and requirements with the successful bidder.

THIS BID IS SUBJECT TO THE, SUPPLY CHAIN MANAGEMENT REGULATIONS, SEKHUKHUNE DISTRICT MUNICIPALITY SUPPLY CHAIN MANAGEMENT POLICY, AND THE GENERAL CONDITIONS OF CONTRACT FOR CONSTRUCTION WORKS (THIRD EDITION) (2015) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.

The Municipality shall adjudicate and award bids in accordance with the Supply Chain Management Regulations, Sekhukhune District Municipality Supply Chain Management Policy (on request from Municipality), and other applicable legislations. Bids will remain valid for 90 (ninety) days.

Acting Municipal Manager Ms N Rampedi
Limpopo Province
Corner van Riebeeck and Chris Wiid Street
Groblersdal
0470

_____
Supply Chain Manager
Mr Voster Masemola

_____
Chief Financial Officer
Mr. Hendrick Nkadimeng

RESPONSIVENESS AND EVALUATION CRITERIA

1. RESPONSIVENESS CRITERIA

Sekhukhune District Municipality will consider no Bid unless it meets the following responsiveness criteria:

- The bid must be properly received in a sealed envelope clearly indicating the description of the service and the bid number for which the bid is submitted.
- The bid must be deposited in the relevant bid box as indicated on the notice of the bid on or before the closing date and time of the bid.
- A valid CSD number must be submitted with the bid on or before the closing time and date of the bid.
- A certified Copy of the company registration certificate must be submitted with the bid on or before the closing time and date of the bid.
- Submission of a Joint Venture Agreement, where applicable, which has been properly signed by all parties.
- Proof of payment of Municipal Rates and Taxes or letter for Tribal Authority or lease agreement must be attached.
- Complies with the requirements of the bid and technical specifications.
- Registered in the relevant Contractor category in the Construction Industry Development Board Register of Contractors (CIDB).
- Adheres to Pricing Instructions.
- Financial ability to execute the Contract.
- Comply in full and observe the requirements of the Notice to Bidders.
- Experience with similar work – demonstrate a track record of a similar scope and size

2. EVALUATION OF BIDS

a) All bids received shall be evaluated in terms of the Supply Chain Management Regulations, Sekhukhune District Municipality Supply Chain Management Policy (on request from Municipality), and other applicable legislations including functionality.

b) The Municipality reserves the right to accept all, some, or none of the bids submitted – either wholly or in part – and it is not obliged to accept the lowest bid. By submitting this bid, bidder authorises the Municipality or its delegate(s) to carry out any investigation deemed necessary to verify the correctness of the statements and documents submitted and that such documents reasonably reflect the ability of the Bidder to provide the goods and services required by the Municipality.

PLEASE NOTE

1. The Municipal Manager may cancel a Contract awarded to a person if:

    a) The person committed a corrupt or fraudulent act during the procurement process or in the execution of the Contract, or

        i. An official or other role player committed any corrupt or fraudulent act during the procurement process or in the execution of the Contract that benefited that person.

2. The Municipal Manager may reject the bid or quote of any company if that company or any of its directors has:

    a) Failed to pay municipal rates and taxes or municipal service charges and such rates, taxes and charges are in arrears for more than three months;

    b) Failed, during the last five years, to perform satisfactorily on a previous Contract with the Sekhukhune District Municipality or any other organ of State after written notice was given to that bidder that performance was unsatisfactory;

    c) Abused the supply chain management system of the Municipality or have committed any improper conduct in relation to this system;

    d) Been convicted of fraud or corruption during the past five years;

    e) Willfully neglected, reneged on or failed to comply with any government, municipal or other public sector Contract curing the past five years; or

    f) Been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No. 12 of 2004) or has been listed on National Treasury's database as a person prohibited from doing business with public sector.

SEKHUKHUNE DISTRICT MUNICIPALITY

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T1.2 Tender Data

The conditions of Bid are the Standard Conditions of Bid as contained in Annex F of the CIDB Standard for Uniformity in Construction Procurement (SFU) of May 2015, as published in Government Gazette No 33239, Board Notice 86 of 2010 of 28 May 2015. Those Standard Conditions of Tender remained the same as those published in the previous edition of the SFU as published in Government Gazette No 31823, Board Notice 12 of 2009 of 30 January 2009 - See www.cidb.org.za.

Each Tenderer shall obtain its own copy of the Standard Conditions of Tender.

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

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

Clause number	Tender Data
EMPLOYER F1.1	The employer is Sekhukhune District Municipality in Limpopo Province. The Employer's domicile citadel et executant (permanent physical business address) is: Bareki Mall Corner van Riebeeck and Chris Wiid Street Groblersdal 0470 The Employer's address for communication relating to this project is: Private Bag X8611 Groblersdal 0470
TENDER DOCUMENTS F.1.2	Volume 1 The tender documents issued by the employer comprise: Part T1 Tendering Procedures T1.1 Tender notice and invitation to tender T1.2 Tender data T1.3 Standard and Particular conditions to tender Part T2 Returnable documents T2.1 List of returnable documents T2.2 Returnable schedules Part C1: Agreements and Contract Data C1.1 Form of offer and acceptance C1.2 Contract Data C1.3 Demand Guarantee and Retention Money Guarantee C1.4 Agreement in terms of Occupational Health and Safety Part C2: Pricing data C2.1 Pricing instructions C2.2 Activity schedules / Bills of Quantities Part C3: Scope of work C3.1 Description of the Works C3.2 List of Drawings C3.3 Procurement C3.4 Construction C3.5 Management of the Works C3.6 Particular Specifications and Variations and Additions to SANS 1200 Standardized Specifications C3.7 Health and Safety Specifications C3.8 Environmental Management during Construction Part 4: Site information C4 Site information Part C4.2 : Drawings Tender Drawings incorporated into the tender document

EMPLOYER'S AGENT F.1.4	The Employer's Agent is: HWA Engineers and Project Managers Physical Address: Postal Address: 24 A Rissik Str. P.O. Box 3472 Polokwane Polokwane 0700 0700 Tel.: (015) 297 5906 Fax: (086) 246 0744 E-mail.: admin@hwaeng.co.za
	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.
EMPLOYER'S RIGHT TO ACCEPT OR REJECT TENDER OFFER 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.
ELIGIBILITY F.2.1	Only those tenderers who can demonstrate that they will 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 during the validity of the contract are eligible to submit tenders. Tender Qualification: Labour Intensive Contracts To qualify for award of the Contract, tenderers shall meet the following minimum qualifying criteria: a) Having participated in and graduated with fully satisfactory results from the relevant national qualification framework training organized under EPWP (or other similar project), and applying trained supervisory staff on a full-time basis for the execution of the works. LIC NQF Level 5. b) Liquid assets/or credit facilities covering the expected expenditures for two full work months c) Proposals for timely acquisition (own, lease, hire, etc.) of the essential minimum equipment d) The contractor will carry out the works using labour-based work methods as described in the Special Conditions of Contract The tenderer must submit to the Employer, 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 requirement. The contractor shall ensure that the minimum supervisor to worker ratio of 1:10 for effective supervision of Labour intensive works for all LI activities.

F.2.2	The following Bidders who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, are eligible to submit tenders: a) Contractors who have a Contractor grading designation equal to or higher than a Contractor grading designation determined in accordance with the sum tendered for an 8 CE or Higher class of construction work 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 8CE 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 the sum tendered for an 8CE or Higher class of construction work. Or 4. The lead partner has a Contractor grading designation in the 8CE or Higher class of construction work; and 5. The two combined Contractors grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a Contractor grading designation determined in accordance with the sum tendered for an 8CE or Higher class of construction work.
F.2.1	Only those Bidders who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in an 8CE or Higher Class of construction work and are registered with the CIDB as having a track record, are eligible to submit tenders.
COST OF TENDERING F2.2	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 comply with requirements.
SITE VISIT AND CLARIFICATION MEETING F.2.7	COMPULSORY site briefing on **08 June 2023 at 11h00** will take place at . Bidders will be allowed to seek clarification by contacting responsible officials assigned to the Contract.
SEEK CLARIFICATION 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.
INSURANCE F2.9	Be aware that the extent of insurance to be provided by the employer (if any) may not be for the full cover required in terms of the conditions of Contract identified in the Contract Data. The Tenderer is advised to seek qualified advice regarding insurance.
ALTERATIONS TO DOCUMENTS 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.

ALTERNATIVE TENDER OFFERS F.2.12	Unless anything to the contrary has been determined in the Contract Data, a Tenderer may, together with his tender for the original designs contained in the Contract Documents, submit alternative designs and tender offers for consideration. All designs, calculations, drawings and Operation and Maintenance manuals shall be fully endorsed by a third party registered engineer, accomplished in such specific field of practice and the cost thereof shall be borne solely by the Contractor. Such alternative designs and offers shall be subject to the following conditions and requirements: 5.4.1. Tenders An alternative offer or design will be considered only if the tender for the original items has been fully priced and completed. The alternative tender offer is to be submitted in the same envelope as the main tender offer, together with a schedule that compares the requirements of the tender documents with the alternative requirements the Tenderer proposes. No alternative tender will be considered unless a tender free from qualifications is also submitted. Unless the alternative offer stipulates to the contrary, it shall be assumed that the period for completion of the Works shall be the same as for the original design. Designs, calculations, drawings and a modified schedule of quantities (as determined hereafter) in respect of each alternative offer or design shall accompany the alternative tender offer and shall be endorsed fully by a third party registered engineer, accomplished in such specific field of practice. 5.4.2. Preliminary calculations Preliminary calculations for an alternative design shall be submitted with the tender. Such calculations shall give adequate details so as to enable an assessment to be made of the general efficacy of the design and of its principal elements, also of the degree to which the design prescriptions and codes of the Employer are being complied with. The calculations shall be clear and in a logical sequence and shall clearly reflect all the design assumptions.
	5.4.3. Preliminary drawings Preliminary drawings of the alternative designs shall also be submitted with the tender. These drawings shall comprise adequate layout plans, elevations and sections and shall clearly illustrate the general efficacy of the design and its principal elements. 5.4.4. Quantities Each alternative offer shall be accompanied by a modified priced schedule of quantities compiled in accordance with the specifications, in so far as it is applicable, which clearly shows the manner in which the price for the alternative offer has been determined and the items in the original schedule of quantities which fall away or are being changed. In addition to the schedule of quantities, a set of calculations shall be supplied to show how the quantities have been determined. All assumptions in regard to factors which will determine quantities shall be clearly and conspicuously marked by underlining or colouring, and shall indicate whether or not the assumptions have been based on information furnished in the Contract Data (with the necessary references). 5.4.5. Further details Should the Employer's Agent find that the calculations and drawings submitted

	for alternative designs are not complete enough for proper adjudication of the alternative designs, the Employer reserves to itself the right to call on the Tenderer to submit such further calculations and drawings as may be required. If such further details are not submitted within ten days of having been requested, the alternative designs will not be given further consideration. 5.4.6. Preliminary adjudication of alternative designs The Employer's Agent will undertake a preliminary scrutiny of any alternative designs for compliance with the specified requirements of the Employer. Should he find any mistakes or unsatisfactory aspects, he may afford the Bidder the opportunity to rectify them within a period to be determined by the Employer's Agent. However, it is emphasized that the preliminary scrutiny of the design and tender by the Employer's Agent, by its very nature, cannot be comprehensive, and no guarantee can be given in this regard that all the mistakes made by the Bidder will in fact be detected. Any correction of such mistakes shall be made with the tender price of the bidder being retained, and, wherever necessary, the priced schedule of quantities for the alternative design shall be adjusted accordingly. 5.4.7. Acceptance of alternative design The Bidder shall note that the acceptance of a tender which includes alternative designs shall mean that the alternative designs have been approved in principle only. If the final calculations, drawings and details do not comply with the specified requirements, such alternative designs may be rejected, unless they are suitably amended by the Bidder so as to be acceptable to the Employer. 5.4.8. Final drawings and calculations and the priced schedule of Quantities Where a tender with an alternative design has been accepted, the Contractor shall, not less than two months before he intends starting with the construction of such design, submit to the Employer's Agent a complete set of working drawings, detailed calculations and a complete schedule of quantities, for approval. The schedule of quantities shall be based on the preliminary schedule of quantities, but with the necessary adjustments in quantities and prices and with the tendered price for the alternative design being retained. Within three weeks of having received the above, the Employer's Agent will indicate which drawings, calculations, quantities, prices and other particulars are acceptable to him and which not, with reasons furnished. The Contractor shall then submit to the Employer's Agent in good time any modified drawings and other particulars for approval, for which he will require two weeks. Any delay arising from the fact that the amended particulars do not meet the requirements shall be the responsibility of the Contractor. No work which will be affected by an alternative design may be commenced, unless the drawings, schedule of quantities and prices for such alternative design have been approved. Should the Contractor fail to modify any drawings, calculations, quantities, prices or any other particulars to the satisfaction of the Employer's Agent, the alternative design will be rejected and the original design shall be constructed for the same amount as has been tendered for the alternative design. 5.4.9. Responsibility for alternative design

	The approval of a design by the Employer's Agent shall not in any way relieve the Bidder of his responsibility to produce a design which conforms in all respects to all the specified requirements and which will be suitable for the purpose envisaged. Should it appear later during construction or during the maintenance period that the design does not conform to the specified requirements, the Contractor only, shall be liable for any damage arising there from and he shall, at his own expense, do all the necessary work to ensure that the Works conforms to all the specified requirements. 5.4.10. Indemnity Once the alternative design has been approved, the Contractor shall indemnify and hold harmless the Employer, its agents and assigns, against all claims howsoever arising out of the said design whether in Contract or delict.
SUBMITTING TENDER OFFERS F.2.13.3	5.5.1. Whole of the Works (Cl. F.2.13.1) Tenderers shall offer to provide for the whole of the Works identified. 5.5.2. Original tender documents (Cl. F2.13.3) The original tender document, issued to the Bidder, shall be submitted in its entirety. No copies are required. 5.5.3. Marking of Tender Submissions (Cl. F2.13.5) The complete tender documents shall be enclosed and sealed in a single envelope, marked: **BID NUMBER: SK8/3/1- 06/2023/24.-: GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C** The Employer's address for delivery of tender offers to be shown on each tender submission package is the Tender Box located at: **AB Sikhosana Fire Station** **Groblersdal** **0470** 5.5.4. Two envelope system (Cl. F.2.13.6) A two-envelope procedure will not be followed. 5.5.5. Closing time (Cl. F.2.15) The closing time for submission of tender offers is: **11H00 on 04/07/2023** Telegraphic, telephonic, telex, facsimile, e-mail, electronic and late tender offers will not be accepted. 5.5.6. Tender offer validity (Cl. F.2.16) The tender offer validity period is 90 days after tender closing date. 5.5.7. Clarification of tender offer after submission (Cl. F.2.17)

	Delete the last part of the second sentence, commencing with the word "and". Furthermore, delete the last two sentences of Cl. F2.17. Add the following sentence: "The rates stated by the Bidder shall be binding". 5.5.8. Provide other Material (Cl. F.2.18.1) Upon request by the Employer, the Bidder shall promptly supply any other material that has a bearing on the tender offer, the bidder's commercial position (including, where applicable, notarized joint venture agreements), Referencing arrangements, or samples of materials, considered necessary by the Employer for the purpose of a full and fair assessment. Should the Bidder not provide the information or material called for, by the time for submission stated in the Employer's request, the Employer will regard the tender offer as being non-responsive. 5.5.9. Certificates (Cl. F.2.23) The following certificates are to be provided with this tender: a) CSD Report, b) Compensation Fund registration certificate, c) Certificate of Contractor Registration issued by the Construction Industry. Development Board or a copy of the application Form for registration in terms of the Construction Industry Development Board Act (Form F006). A minimum grading of 8CE is required. Important Note: Failure to provide the required particulars as per the above-listed certificates implies a non-responsive tender and warrants rejection of the tender on account of non-compliance with the requirements of the Tender Data.
OPENING OF TENDER SUBMISSIONS F.3.4	Tenders will be opened immediately after the closing time of tenders at Sekhukhune District Municipality

EVALUATION OF TENDER OFFERS F.3.11	Technical adjudication and General Criteria • Tenders will be adjudicated in terms of inter alia: • Compliance with Tender conditions • Technical specifications If the Bidder does not comply with the Tender Conditions, the Bid may be rejected. If technical specifications are not met, the Bid may also be rejected. With regard to the above, certain actions or errors are unacceptable and warrants *REJECTION OF THE TENDER*, for example: • Pages to be completed, removed from the Tender document, and have therefore not been submitted. • If tender document is not fully completed as required and as stipulated in the tender data. • Failure to complete the schedule of quantities as required – only lump sums provided. • Scratching out without initialling next to the amended rates or information. • Writing over / painting out rates / the use of tippex or any erasable ink, e.g., pencil. • The Tender has not been properly signed by a party having the authority to do so, according to the – "Authority for Signatory", No authority for signatory submitted. • A Resolution by a Board of Directors of the Company authorizing the Bidder to sign the Tender document on behalf of the Company. Particulars required in respect of the Tender have not been provided – non-compliance of Tender requirements and/or specifications. • The Bidder's attempts to influence or has in fact influenced the evaluation and/or awarding of the Contract. • The Tender has been submitted after the relevant closing date and time
	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. (Method 3) 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. Determination of expertise and experience of bidders. 5. Awarding of points for functionality. 6. Ranking of bidders according to the total points. 7. Performance of risk analysis by checking the capacity of the bidders.
ACCEPTANCE AND OFFER F3.13.1	Tender offers will only be accepted if: a) the Bidder has in his or her possession a valid Tax Clearance Certificate issued by the South African Revenue Services or has made arrangements to meet outstanding tax obligations; b) the Bidder is registered with the Construction Industry Development Board

	in an appropriate Contractor grading designation; c) the Bidder 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; d) the Bidder has not: i) abused the Employer's Supply Chain Management System; or ii) failed to perform on any previous Contract and has been given a written notice to this effect; and e) has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the Bidder's ability to perform the Contract in the best interests of the employer or potentially compromise the tender process.
PROVIDE COPIES OF THE CONTRACTS F.3.17	The number of paper copies of the signed Contract to be provided by the employer is one.

1. EVALUATION OF TENDERS

Evaluation Criteria

Municipal Supply Chain Management Policy will be used for evaluation of Prospective Service Provider as per the approved scoring system by the specification committee.

The Construction Firm's tender responsiveness in relation to points is therefore summarized as follows:

Organising and Staffing	35
Plant	20
Experience of Firm	35
Programme and cashflow	10
Sub-Total	**100**

A firm must obtain a minimum of 80 Points out of the 100 points above. The functionality points shall be distributed as follows below:

Project Manager / Contracts Manager (Maximum points obtainable 10; minimum 0)

Name: ……..

Evaluation Criteria	Minimum Required	Points obtainable	Points Claimed
Academic Qualifications			
Academic Qualifications Attained	NQ7-Degree in Civil Engineering or equivalent and LIC NQF Level 5	3	
	Diploma in Civil Engineering or equivalent and LIC NQF Level 5	2	
	Diploma in Project Management or equivalent and LIC NQF Level 5	1	
	Matric	0	
Sub-total		3	
Involvement of Project Manager / Contracts Manager in bulk water pipeline or similar projects.			
Number of comparable projects involved in.	0	0	
	1 – 2	1	
	3 – 4	2	
	5 upwards	4	
Sub-total		4	
Years of Experience in bulk water pipeline or similar projects			
Involvement in comparable projects (Technical)	0	0	
	1 – 2	1	
	3 – 4	2	
	5 upwards	3	
Sub-total		3	
Total		10	

Attach CV and certified copies of qualifications

Construction Manager: (*Maximum Points obtainable 10, minimum 0)*

Name: …….

Evaluation Criteria	Minimum Required	Points obtainable	Points Claimed
Academic Qualifications			
Academic Qualifications Attained	NQ7-Degree in Civil Engineering or Equivalent and LIC NQF Level 5	3	
	Diploma in Civil Engineering or equivalent and LIC NQF Level 5	1.5	
	No formal Education in Construction and LIC NQF Level 5	0	
Sub-total		3	
Involvement of Site Agent in bulk water pipeline or similar projects.			
Number of comparable projects involved in.	0	0	
	1 – 2	1	
	3 – 4	2	
	5 upwards	4	
Sub-total		4	
Years of Experience in bulk water pipeline or similar projects			
Years of experience in bulk water pipeline projects	0	0	
	1 – 2	1	
	3 – 4	2	
	5 upwards	3	
Sub-total		3	
Total		10	

Attach CV and certified copies of qualifications

Note: Should the_Construction Mana_be the same as Contracts Manager zero points will be allocated.

Site Foreman: (*Maximum Points obtainable 10; minimum 2.5)*

Name: ……

Evaluation Criteria	Minimum Required	Points obtainable	Points Claimed
Academic Qualifications	N6 in Civil Engineering or NQF Level 4, "National Certificate: Supervision of Civil Engineering Construction Processes".	3	
	Matric	1.5	
	No formal qualification	0	
Sub-total		3	
Involvement of Foreman in bulk water pipeline or similar projects.			
Number of comparable projects involved in.	0	0	
	1 – 2	1	
	3 – 4	2	
	5 upwards	4	
Sub-total		4	
Years of Experience in bulk water pipeline or similar projects			
Years of experience in bulk water pipeline or similar projects after qualification	0	0	
	1-4	1	
	4 – 9	2	
	10 upwards	3	
Sub-total		3	
Total		10	

Attach CV and certified copies of qualifications

Note: Should the Site Foremen be the same Site Agent and Team leader zero points will be allocated

Safety Officer: *(Maximum Points obtainable 5; minimum 3)*

Name: …….

Evaluation Criteria	Minimum Required	Points obtainable	Points Claimed	
Academic Qualifications	Occupational Health and Safety Certificate or equivalent (SAMTRAC)	2		
Sub-total		2		
Years of experience in comparable projects after qualification	1-4	1		
	5-9	1.5		
	10 upwards	3		
Sub-total		3		
Total		5		

Attach CV and certified copies of qualifications

Note: Should the Safety Officer be the same as Contracts Manager, Site Agent, Site Foreman zero points will be allocated.

ORGANISING AND STAFFING/PERSONNEL		
PERSONNEL	TOTAL	SCORES
Project Manager/Contracts Manager	10	
Site Agent	10	
Site Foreman	10	
Health and Safety Officer	5	
TOTAL	35	

PLANT (Maximum Points obtainable 20)

It must be noted that total points of 20 are obtainable by the Construction Firm in relation to the requirements as mentioned on the table below, failure to submit evidential supporting documents is not an eliminating factor BUT a zero point will be scored. Letter of intent/ Lease agreement or quotation from the lessor must be attached.

Evaluation Criteria	Minimum Required	Points obtainable (Own)	Points Claimed
Firm's plant and equipment Note: Proof of ownership of the firm's equipment must be attached and failure to do so will result in forfeiting the plant points	Excavator (Min 20 Ton) x 1	5	
	Crane/ Crane Truck	4.5	
	TLBs (4x4) x1	4	
	Tipper Truck x1	2.5	
	Firm's number of Walk behind Roller x1	2.5	
	LDV (1 ton or equivalent)	1.5	
Sub-total		20	
Total		20	

Attach a letter of intent/ Lease agreement and/or proof of ownership of plant.

EXPERIENCE OF FIRM (Maximum Points obtainable 35)

Note: Company's previous completed projects

It must be noted that the experience of the firm carries a maximum of 35 points as indicated in the table below. If proof of testimonials and appointment letters, in reference to Form E not provided, then the bidder shall obtain zero points on the experience of the firm.

Provide proof of the company's previous completed projects which is in the form appointment letters and completion certificates. Verifiable references (appointment letters and completion certificates) with contact details must be attached.

Similar projects are for construction of bulk water pipelines only. (Including VAT)

Evaluation Criteria	Evaluation Criteria	Points obtainable	Points Claimed
Company experience in terms of projects of a similar scope completed (Max 5 projects) undertaken in the last 10 years.	Project of similar scope (*pipelines / bulk water)* with minimum value R5m to R10m - 2 points each	10 (max)	
	Projects of similar scope (pipelines / bulk water) with minimum value R10.0 to R20m – 5 points each.	25 (max)	
	Projects of similar scope (*pipelines / bulk water pipeline)* with minimum value of above R20m - 7 points each	35 (max)	
Sub-Total		35	
TOTAL(Max)		35	

Attach proof of company's previous completed projects (Appointment letters and Completion Certificates).

Programme and cashflow (Maximum Points obtainable 10)

It must be noted that total points of 10 are obtainable by the Construction Firm in relation to the requirements as mentioned on the table below, failure to submit evidential supporting documents is not an eliminating factor BUT a zero point will be scored.

Evaluation Criteria	Minimum Required	Points obtainable (Own)	Points Claimed
Cashflow	Cashflow linked to milestones	5	
	Cashflow not linked to programme and unbalanced	2	
Sub-total		**5**	
Programme	Programme with sub activities showing linkages and critical path	5	
	Programme without sub activities and linkages	2	
Sub-total		**5**	
Total		**10**	

TOTAL SCORE: _____/100

Standard Conditions of Tender

F.1 General Conditions

F.1.1 Actions

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

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

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

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

F.1.2 Tender Documents

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

F.1.3 Interpretation

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

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

F.1.3.3 For the purposes of these conditions for the calling for expressions of interest, the following definitions apply:

a) comparative offer means the Bidder's financial offer after the factors of non-firm prices, all unconditional discounts and any other tendered parameters that will affect the value of the financial offer have been taken into consideration
b) corrupt practice means the offering, giving, receiving or soliciting of anything of value to influence the action of the Employer or his staff or agents in the tender process; and
c) fraudulent practice means the misrepresentation of the facts in order to influence the tender process or the award of a Contract arising from a tender offer to the

detriment of the Employer, including collusive practices intended to establish prices at artificial levels

d) quality (functionality) means the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs

F.1.4 Communication and Employer's agent

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 read, copied and recorded. Writing 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 The Employer's right to accept or reject any tender offer

F.1.5.1 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 Bidder for such cancellation and rejection but will give written reasons for such action upon written request to do so.

F.1.5.2 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 Bidder.

F.2 Bidder's obligations

F.2.1 Eligibility

Submit a tender offer only if the Bidder complies with the criteria stated in the tender data and the Bidder, or any of his principals, is not under any restriction to do business with Employer.

F.2.2 Cost of tendering

F2.2.1 Accept that, 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 comply with requirements.

F.2.3 Check documents

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

F.2.4 Confidentiality and copyright of documents

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

F.2.5 Reference documents

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

F.2.6 Acknowledge addenda

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

F.2.7 Clarification meeting

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

F.2.8 Seek clarification

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

F.2.9 Insurance

Be aware that the extent of insurance to be provided by the Employer (if any) may not be for the full cover required in terms of the conditions of Contract identified in the Contract Data. The Tenderer is advised to seek qualified advice regarding insurance.

F.2.10 Pricing the tender offer

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

F2.10.2 Show VAT payable by the Employer separately as an addition to the tendered total of the prices.

F.2.10.3 Provide rates and prices that are fixed for the duration of the Contract and not subject to adjustment except as provided for in the conditions of Contract identified in the Contract Data.

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

F.2.11 Alterations to documents

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the Employer, or necessary to correct errors made by the Bidder. All signatories to the tender offer shall initial all such alterations. Erasures and the use of masking fluid are prohibited.

F.2.12 Alternative tender offers

F.2.12.1 Submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted. The alternative tender offer is to be submitted with the main tender offer together with a schedule that compares the requirements of the tender documents with the alternative requirements the Bidder proposes.

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

F.2.13 Submitting a tender offer

F.2.13.1 Submit a tender offer to provide the whole of the works, services or supply identified in the Contract Data and described in the scope of works, unless stated otherwise in the tender data.

F.2.13.2 Return all returnable documents to the Employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing in black ink.

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

F.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The Employer will hold all authorized signatories liable on behalf of the Bidder. Signatories for Bidders proposing to Contract as joint ventures shall state which of the signatories is the lead partner whom the Employer shall hold liable for the purpose of the tender offer.

F.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the Employer's address and identification details stated in the tender data, as well as the Bidder's name and contact address.

F.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked “financial proposal” and place the remaining returnable documents in an envelope marked “technical proposal”. Each envelope shall state on the outside the Employer’s address and identification details stated in the tender data, as well as the Bidder's name and contact address.

F.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the Employer's address and identification details as stated in the tender data.

F.2.13.8 Accept that the Employer shall 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.

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

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

F.2.15 Closing time

F.2.15.1 Ensure that the Employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Proof of posting shall not be accepted as proof of delivery. The Employer shall not accept tender offers submitted by telegraph, telex, facsimile or e-mail, unless stated otherwise in the tender data.

F.2.15.2 Accept that, if the Employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

F.2.16 Tender offer validity

F.2.16.1 Hold the tender offer(s) valid for acceptance by the Employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

F.2.16.2 If requested by the Employer, consider extending the validity period stated in the tender data for an agreed additional period.

F.2.17 Clarification of tender offer after submission

Provide clarification of a tender offer in response to a request to do so from the Employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the total of the prices or substance of the tender offer is sought, offered, or permitted. The total of the prices stated by the Bidder shall be binding upon the Bidder.

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

F.2.18 Provide other material

F.2.18.1 Provide, on request by the Employer, any other material that has a bearing on the tender offer, the Bidder'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 Bidder not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the Employer's request, the Employer may regard the tender offer as non-responsive.

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

F.2.19 Inspections, tests and analysis

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

F.2.20 Submit securities, bonds, policies, etc.

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

F.2.21 Check final draft

Check the final draft of the Contract provided by the Employer within the time available for the Employer to issue the Contract.

F.2.22 Return of other tender documents

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

F.2.23 Certificates

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

F.3 The Employer's undertakings

F.3.1 Respond to clarification

Respond to a request for clarification received up to five working days prior to the tender closing time stated in the Tender Data and notify all Bidders who drew procurement documents.

F.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each Bidder during the period from the date of the Tender Notice until seven days before the tender closing time stated in the Tender Data. If, as a result a Bidder applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, will then notify it to all Bidders who drew documents.

F.3.3 Return late tender offers

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

F.3.4 Opening of tender submissions

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

F.3.4.2 Announce at the opening held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each Bidder whose tender offer is opened, the total of his prices, preferences claimed and time for completion, if any, for the main tender offer only.

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

F.3.5 Two-envelope system

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

F.3.5.2 Evaluate the quality of the technical proposals offered by Bidders, then advice Bidders who remain in contention for the award of the Contract of the time and place when the financial proposals will be opened. Open only the financial proposals of Bidders, who score in the quality evaluation above the minimum number of points for quality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any preferences claimed. Return unopened financial proposals to Bidders whose technical proposals failed to achieve the minimum number of points for quality.

F.3.6 Non-disclosure

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

F.3.7 Grounds for rejection and disqualification

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

F.3.8 Test for responsiveness

Determine, on opening and before detailed evaluation, whether each tender offer properly received:

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

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

- detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
- change the Employer's or the Bidder's risks and responsibilities under the Contract, or
- affect the competitive position of other Bidders presenting responsive tenders, if it were to be rectified.

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

F.3.9 Arithmetical errors

Check responsive tender offers for arithmetical errors, correcting them in the following manner:

- Where there is a discrepancy between the amounts in figures and in words, the amount in words shall govern.
- If bills of quantities (or schedule of rates) 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 will be corrected.
- 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 Bidder's addition of prices, the total of the prices shall govern and the Bidder will be asked to revise selected item prices (and their rates if a bill of quantities applies) to achieve the tendered total of the prices.

Consider the rejection of a tender offer if the Bidder does not correct or accept the correction of his arithmetical errors in the manner described above.

F.3.10 Clarification of a tender offer

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

F3.11 Evaluation of tender offers

F3.11.1 General

Appoint an evaluation panel of not less than three persons. Reduce each responsive tender offer to a comparative offer and evaluate them using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

F3.11.2 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.

b) Recommend the highest ranked Bidder for the award of the Contract, unless there are compelling and justifiable reasons not to do so.

c) Re-rank all Bidders should there be compelling and justifiable reasons not to recommend the highest ranked Bidder and recommend the highest ranked Bidder, unless there are compelling and justifiable reasons not to do so and the process set out in this subclause is repeated.

F3.11.3 Methods 2: Financial offer and preference

In the case of a financial offer and preferences:

a) Score each tender in respect of the financial offer made and preferences claimed, if any, in accordance with the provisions of 3.11.7 and 3.11.8.

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 3.11.7;

N_P is the number of tender evaluation point awarded for preferences claimed in accordance with F3.11.8.

c) Rank tender offers from the highest number of tender evaluation points to the lowest.

d) Recommend the Bidder 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.

e) Rescore and re-rank all Bidders should there be compelling and justifiable reasons not to recommend the Bidder with the highest number of tender evaluation points, and recommend the Bidder with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this subclause is repeated.

F3.11.4 Method 3: 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 the quality offered in accordance with the provisions of F3.11.7 and F3.11.9, 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 F3.11.7;

N_Q is the number of tender evaluation point awarded for preferences claimed in accordance with F3.11.9.

c) Rank tender offers from the highest number of tender evaluation points to the lowest.

d) Recommend the Bidder 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.

e) Rescore and re-rank all Bidders should there be compelling and justifiable reasons not to recommend the Bidder with the highest number of tender evaluation points and recommend the Bidder with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this subclause is repeated.

F3.11.5 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, preference claimed, if any, and the quality offered in accordance with the provisions of 3.11.7 to 3.11.9, 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:

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

Where: N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with 3.11.7

N_P is the number of tender evaluation points awarded for preferences claimed in accordance with 3.11.8

N_Q is the number of tender evaluation points awarded for quality offered in accordance with 3.11.9.

c) Rank tender offers from the highest number of tender evaluation points to the lowest.

d) Recommend the Bidder 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.

e) Rescore and re-rank all Bidders should there be compelling and justifiable reasons not to recommend the Bidder with the highest number of tender evaluation points and recommend the Bidder with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this subclause is repeated.

F3.11.6 Decimal places

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

F3.11.7 Scoring Financial Offers

Score the financial offers of remaining responsive tender offers using the following formula:

$$N_{FO} = W_1 \times A$$

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 a number calculated using the formula and option described in Table 1 as stated in the Tender Data.

Table 1: Formulae for calculating the value of A

Formula	Comparison aimed at achieving	Option 1[a]	Option 2[a]
1	Highest price or discount	$A = \left(1 + \frac{(P - P_m)}{P_m}\right)$	$A = P / P_m$
2	Lowest price or percentage commission / fee	$A = \left(1 - \frac{(P - P_m)}{P_m}\right)$	$A = P_m / P$
P_m is the comparative offer of the most favourable comparative offer. P is the comparative offer of the tender offer under consideration.			

F3.11.8 Scoring preferences

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

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

F3.11.9 Scoring quality

Score each of the criteria and sub criteria for quality in accordance with the provisions of the Tender Data.

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

$$N_Q = W_2 \times S_O / M_S$$

Where: S_O 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; and
W_2 is the maximum possible number of tender evaluation points awarded for the quality as stated in the tender data.

F.3.12 Insurance provided by the Employer

No insurance is provided by the Employer.

F.3.13 Acceptance of tender offer

F3.13.1 Tender Offers will only be accepted on condition that:

a) the tender offer is signed by a person authorised to sign on behalf of the Bidder;

b) a valid Tax Clearance Certificate is included with his tender;

c) Bidder's declaration of compliance with the Occupational Health and Safety Act No. 85 of 1993 and the construction Regulations 2014 as well as the Bidder's health and safety plan, in included with his tender submission;

d) a Bidder who submitted a tender as a Joint Venture has included an acceptable Joint Venture agreement with his tender;

e) the Bidder or a competent authorised representative of the Contractor who submitted the tender has attended the compulsory clarification meeting or site inspection;

f) The Contractor who submits the tender has been registered with the Construction Industry Development Board in accordance with the Construction Industry Development Board Act No. 38 of 2000 and the CIBD Regulations 2014 promulgated in terms of the Act, or if the Contractor can submit proof or evidence that he will be able to register within 10 days of the closing date for submission of tenders;

g) The Bidder or any of its principals 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;

h) The Bidder has not abused the Employer's Supply chain Management System or has failed to perform on any previous Contract and has been given a written notice to his effect;

i) The Bidder or any of its principals, directors or managers is not employed in the service of the State or any municipality. In the event that such principals are involved, official approval from the Executing Authority regarding carrying out remunerative work outside of the public service must be included in the tender submission.

j) The Employer is satisfied that the Bidder or any of his principals have not influenced the tender offer and acceptance by the following criteria:

i. having offered, promised or given a bribe or other gift or remuneration to any person in connection with the obtaining or execution of this Contract;

ii. having acted in a fraudulent or corrupt manner in obtaining or executing this Contract;

iii. having approached an officer or employee of the Employer or the employer's Agent with the objective of influencing the award of a Contract in the Bidder's favour;

iv. having entered into any agreement or arrangement, whether legally or not, with any other person, firm or company to refrain from tendering for his Contract or as to the amount of the Tender to be submitted by either party;

v. having disclosed to any other person, firm or company other than the Employer, the exact or approximate amount of his proposed Tender;
vi. The Employer may, in addition to using any other legal remedies, repudiate the Tender offer and acceptance and declare the Contract invalid should it have been concluded already.

F.3.13.2 Notify the successful Bidder of the employer's acceptance of his 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. Providing the form of offer and acceptance does not contain any qualifying statements, it will constitute the formation of a Contract between the employer and the successful Bidder as described in the form of offer and acceptance.

F.3.14 Notice to unsuccessful Bidders

After the successful Bidder has acknowledged the employer's notice of acceptance, notify other Bidders that their tender offers have not been accepted.

F.3.15. Prepare 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,
c) other revisions agreed between the employer and the successful Bidder, and
d) the schedule of deviations attached to the form of offer and acceptance, if any.

F.3.16 Issue final Contract

Prepare and issue the final draft of Contract Documents to the successful Bidder for acceptance as soon as possible after the date of the employer's signing of the form of offer and acceptance (including the schedule of deviations, if any). Only those documents that the conditions of tender require the Bidder to submit, after acceptance by the employer, shall be included.

F.3.17 Complete adjudicator's Contract

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

F.3.18 Provide copies of the Contracts

Provide to the successful Bidder 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.

F.3.19 Provide written reasons for actions taken

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

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

T2.1 LIST OF RETURNABLE DOCUMENTS

	Generic	Tick if completed
1	Authority for Signatory *(Compulsory)*.	
2	Certificate of Authority for Joint Venture *(Compulsory where applicable).*	
3	Certified copy of identity documents for directors.	
4	Proof of municipal rates for the company and its directors not in arrears for more than 30 days. Altenatively, proof of lease agreement including rates for landlord. In case the company Director is registered in a rural area where rates are not paid, please attach proof from Local Authority and Affidavit under oath indicating that there are no municipal rates payable ***(Compulsory).***	
5	Compulsory Enterprise Questionnaire- Form O ***(Compulsory).***	
6	Copy of Company Registration Documents or CK1 for Close Corporations ***(Compulsory).***	
7	Form of offer to be properly signed ***(Compulsory).***	
8	Declaration of Interest (**MBD4**) ***(Compulsory).***	
9	Declaration of Bidder's Past Supply Chain Management Practices (**MBD8**) ***(Compulsory).***	
10	Valid Tax Clearance Certificate Issued by the South African Revenue Service. *or PIN issued by SARS.*	
11	**MBD 5 (Compulsory).** Documentation if Tender Exceeds R10 Million -If the bidder is required by law to prepare AFS for Auditing, the AFS for the past three years or since the establishment if Establishment during the past three years -A certificate signed by the bidder certifying that the bidder 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. In case where the Company or Director is from rural areas where the rates are not paid, please attach proof from Local Authority indicating that he/she does not pay municipal rates, this must also be supported by an affidavit from SAPS.	
12	CSD Registration/CSD Summary Report **.**	
13	Valid Letter of Good Standing (COIDA) **(Compulsory).**	
14	Copy of Certificate of Contractor Registration as proof of his registration with the CIDB as a Category **7CE or Higher** Contractor. Or Written proof of his application to the CIDB for registration as a Contractor in the category listed above **(Compulsory).**	
15	All pages must be initialed**.**	

T2.2 RETURNABLE SCHEDULES

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T2.2.1 FORM A: SCHEDULE OF PROPOSED SUB-CONTRACTORS

We notify you that it is our intention to employ the following Sub-Contractors for work in this Contract.

If we are awarded a Contract, we agree that this notification does not change the requirement for us to submit the names of proposed Sub-Contractors in accordance with requirements in the Contract for such appointments. If there are no such requirements in the Contract, then your written acceptance of this list shall be binding between us.

	Name and address of proposed Sub-Contractor	Nature and extent of work
1.		
2.		
3.		
4.		
5.		

Signature of person authorised to sign the Bid: ……

Date: ……...

T2.2.2 FORM B: SCHEDULE OF PLANT AND EQUIPMENT

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

(a) Details of major equipment that is owned by and immediately available for this Contract.

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

(b) Details of major equipment that will be hired, or acquired for this Contract if my/our Bid is acceptable.

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

Signature of person authorised to sign the Bid: ……

Date: ……

T2.2.3 FORM C: RECORD OF ADDENDA TO BID DOCUMENTS

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

	Date	Title of Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Attach additional pages if more space is required.

Signature of person authorised to sign the Bid: ……

Date: ……

T2.2.4 FORM D: CERTIFICATE OF BIDDER'S ATTENDANCE OF COMPULSORY CLARIFICATION MEETING

This is to certify that I,.....

representative of (Bidder).....

of (address) .....

.....

Telephone No : .....

Fax No : .....

attended a compulsory clarification meeting on the .....day of .....20.....

in the company of (Employer's Agent's representative) .....

Signature of person authorised to sign the Bid: …….....

Date: ……..

T2.2.5 FORM E: KEY PERSONNEL AND NON-LOCAL WORKERS TO BE EMPLOYED

The Bidder shall insert in the spaces below, the name of non-local key personnel and non-local workers to be engaged on the Contract.

CATEGORY OF EMPLOYEE	NAME OF EMPLOYEE	Academic Qualifications	Professional Registration	YEARS EXPERIENCE
Construction Project Manager				
Site Agent				
Foreman				
Health & Safety Officer				

Attach additional pages if more space is required.

* The Contractor must fill in the various categories, e.g., Site, Agent, Foreman, Trainers, Plant Operators, Clerks, Technicians, Laboratory Assistants, etc. as required.

Signature of person authorised to sign the Bid: …….....

Date: ……..

T2.2.6 FORM F: SCHEDULE OF WORK CARRIED OUT BY THE BIDDER

The Bidder shall list in the spaces provided below a completed list of Bulk water pipeline related Contracts of similar nature awarded to the Bidder. This information may be deemed to be material to the award of this Bid. Proof should be submitted with this Bid e.g., Appointment and *Completion certificates.*

Description Nature of Work	Value (R) VAT excluded	Period work executed		Reference			
		Appointment Date	Completion Date	Name		Organisation	Tel no and email address
				Employer			
				Consultant			
				Employer			
				Consultant			
				Employer			
				Consultant			
				Employer			
				Consultant			
				Employer			
				Consultant			
				Employer			
				Consultant			
				Consultant			

Signature of person authorised to sign the Bid: ……
Date: ……

T2.2.7 FORM G: ALTERATIONS BY BIDDER

Should the Bidder desire to have any departures from, or modifications to the General Conditions of Contract, Specifications, Bill of Quantities or Drawings considered, or to qualify his Bid in any way, he shall set out his proposals clearly hereunder or alternatively state them in a covering letter attached to his Bid and referred to hereunder.

PAGE	DESCRIPTION

Signature of person authorized to sign the Bid: ……..…

Date:. …….

T2.2.8 FORM H: AUTHORITY OF SIGNATORY

(i) AUTHORITY FOR SIGNATORY

Signatories for companies must establish their authority by attaching to this form a copy of the relevant resolution by their Board of Directors, duly signed and dated.

An example is shown below:

"By resolution of the Board of Directors taken on ……..20 …….

Mr/Ms/Mrs/Prof/Dr.……

Has been duty authorized to sign all documents in connection with Contract No. ……..

And any Contract which may arise there from on behalf of (block capitals) ……

……..

SIGNED ON BEHALF OF THE COMPANY: …….

IN HIS CAPACITY AS:……..

DATE: ……..

SINGNATURE OF SIGNATORY: ……

*PLEASE NOTE THAT, THIS IS JUST AN EXAMPLE OF AUTHORITY FOR SIGNATORY. YOU ARE REQUIRED TO SUBMIT A COPY OF A RELEVANT RESOLUTION OF THE BOARD OF DIRECTORS.

THIS APPLIES TO COMPANIES WITH MORE THAN ONE MEMBERS

FAILURE TO SUBMIT A COPY OF A RELEVANT RESOLUTION OF THE BOARD OF DIRECTORS, SHALL DISQUALIFY THE TENDER.

T2.2.9 FORM I: QUALITY MANAGEMENT SYSTEMS STATUS OF BIDDING ENTITY

Briefly describe the construction quality system incorporated by the Bidder in his organisation and which will be applicable to this Contract.

	Internal	External	Name of responsible Company /or Person (In case of Person give years' experience and qualification)
Survey: Setting out of the works and control			
Testing Laboratory			
Additional quality systems			

Signature of person authorised to sign the Bid: ……

Date: ……...

T2.2.10 FORM J: ESTIMATED MONTHLY EXPENDITURE

The Bidder shall, in the table below, state the estimated cash flow on the Contract based on his preliminary programme, his Bidded unit rates and his submission of payment certificates to the Employer. Amounts for Contract Price Adjustment shall not be included.

Payment Certificate No.	Amount (VAT Included)					
	a	b	a-b			Cumulative cash flow
	Payments Received	Expenditure		Net cash flow		
1	None		d		j=d	
2			e		k=j+e	
3			f		l=k+f	
4			g		m=l+g	
5			h		n=m+h	
6			etc		etc	
7						
8						
9						
10						
etc.						
Maximum negative cash flow: take the largest negative number in the last column and write it here >>						

From what sources will you fund the above amount (e.g., funds internally available, bank overdraft, loan, partner (his source), etc.)

……

……

Signature of person authorised to sign the Bid: ……..

Date: ……...

T2.2.11 FORM K: CONSTRUCTION PROGRAMME

An initial, suitable and realistic construction programme shall be submitted with this Bid document. The initial start date for the purpose of the programme is 01 July 2023 The programme shall be in the form of a Gantt chart and shall include the following details:

- A work breakdown structure, identifying the major activity groups.
- For each activity group further details shall be provided with regard to the scheduled start and end dates of individual activities.
- The linkages between activities shall be clearly indicated and the logical network upon which the programme is based.
- The critical path(s) shall be clearly indicated and floats on non-critical activities shall be shown.
- The Contractor shall indicate the working hours per day, night, week and month allowed for in the programme.
- Where relevant the Contractor shall state the production rates for key activities, e.g.
-
- earthworks, etc.

Together with the programme as detailed above the Bidder shall submit a cash flow projection, indicating projected monthly invoice amounts. The cash flow projection should relate to FORM K above.

Failure to submit initial construction programme and cashflow are not eliminating factors but zero (0) will be scored.

Signature of person authorised to sign the Bid: …….....……

Date: ……

T2.2.12 FORM L: COMPLIANCE WITH OHSA (ACT 85 OF 1993)

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

1. Is the Contractor familiar with the OHSA (ACT 85 of 1993) and its Regulations?	YES / NO
2. Who will prepare the Contractor's Health and Safety Plan? (Provide a copy of the person/s curriculum vitae/s or company profile).	
3. Does the Contractor have a health and safety policy? (If yes, provide a copy). How is this policy communicated to all employees?	YES / NO
4. Does the Contractor keep records of safety aspects of each construction site? If yes, what records are kept?	YES / NO
5. Does the Contractor conduct monthly safety meetings? If yes, who is the chairperson of the meeting, and who attend these meetings?	YES / NO
6. Does the Contractor have a safety officer in his employment, responsible for the overall safety of his company? If yes, please explain his duties and provide a copy of his CV.	YES / NO
7. Does the Contractor have trained first aid employees? If yes, indicate, who.	YES / NO
8. Does the Contractor have a safety induction training programme in place? (If yes, provide a copy)	YES / NO

Signature of Bidder: ……

Date: ……

MBD 5

T2.2.13 FORM M: COMPANY INFORMATION FOR BIDS GREATER THAN R10 MILLION

This document must be signed and submitted together with your Tender

A. THE NATIONAL INDUSTRIAL PARTICIPATION PROGRAMME

INTRODUCTION

The National Industrial Participation (NIP) Programme, which is applicable to all government procurement Contracts that have an imported content, became effective on the 1 September 1996. The NIP policy and guidelines were fully endorsed by Cabinet on 30 May 1997. In terms of the Cabinet decision, all state and parastatal purchases / lease Contract s (for goods, works and services) entered into after this date, are subject to the NIP requirements. NIP is obligatory and therefore must be complied with. The Industrial Participation Secretariat (IPS) of the Department of Trade and Industry (DTI) is charged with the responsibility of administering the programme.

1PILLARS OF THE PROGRAMME

1.1 The NIP obligation is benchmarked on the imported content of the Contract. Any Contract having an imported content equal to or exceeding US$ 10 million or other currency equivalent to US$ 10 million will have a NIP obligation. This threshold of US$ 10 million can be reached as follows:

(a) Any single Contract with imported content exceeding US$10 million, Or

(b) Multiple Contracts for the same goods, works or services each with imported content exceeding US$3 million awarded to one seller over a 2-year period which in total exceeds US$10 million. or

(c) A Contract with a renewable option clause, where should the option be exercised the total value of the imported content will exceed US$10 million. or

(d) Multiple suppliers of the same goods, works or services under the same Contract, where the value of the imported content of each allocation is equal to or exceeds US$ 3 million worth of goods, works or services to the same government institution, which in total over a two (2) year period exceeds US$10 million.

1.2 The NIP obligation applicable to suppliers in respect of sub-paragraphs 1.1 (a) to 1.1 (c) above will amount to 30 % of the imported content whilst suppliers in respect of paragraph 1.1 (d) shall incur 30% of the total NIP obligation on a *pro-rata* basis.

1.3 To satisfy the NIP obligation, the DTI would negotiate and conclude agreements such as investments, joint ventures, sub-Contracting, licensee production, export promotion, sourcing arrangements and research and development (R&D) with partners or suppliers

A period of seven years has been identified as the time frame within which to discharge the obligation

2. REQUIREMENTS OF THE DEPARTMENT OF TRADE AND INDUSTRY

2.1 In order to ensure effective implementation of the programme, successful Tenderers (Contractors) are required to, immediately after the award of a Contract that is in excess of R10 million (ten million Rands), submit details of such a Contract to the DTI for reporting purposes.

2.2 The purpose for reporting details of Contracts in excess of the amount of R10 million (ten million Rands) is to cater for multiple Contracts for the same goods, works or services; renewable Contracts and multiple suppliers for the same goods, works or services under the same Contract as provided for in paragraphs 1.1.(b) to 1.1. (d) above.

3 TENDER SUBMISSIONS AND CONTRACT REPORTING REQUIREMENTS OF TENDERERS AND SUCCESSFUL TENDERERS (CONTRACTORS)

3.1 Tenderers are required to sign and submit this Standard Tendering Document (SBD 5) together with the Tender on the closing date and time.

3.2 In order to accommodate multiple Contract s for the same goods, works or services; renewable Contract s and multiple suppliers for the same goods, works or services under the same Contract as indicated in sub-paragraphs 1.1 (b) to 1.1 (d) above and to enable the DTI in determining the NIP obligation, successful Tenderers (Contractors) are required, immediately after being officially notified about any successful Tender with a value in excess of R10 million (ten million Rands), to contact and furnish the DTI with the following information:

- Tender / Contract number.
- Description of the goods, works or services.
- Date on which the Contract was accepted.
- Name, address and contact details of the government institution.
- Value of the Contract.
- Imported content of the Contract, if possible.

3.3 The information required in paragraph 3.2 above must be sent to the Department of Trade and Industry, Private Bag X 84, Pretoria, 0001 for the attention of Mr Elias Malapane within five (5) working days after award of the Contract. Mr Malapane may be contacted on telephone (012) 394 1401, facsimile (012) 394 2401 or e-mail at Elias@thedti.gov.za for further details about the programme.

4 PROCESSES TO SATISFY THE NIP OBLIGATION

4.1 Once the successful Tenderer (Contractor) has made contact with and furnished the DTI with the information required, the following steps will be followed:

(a) the Contractor and the DTI will determine the NIP obligation;

(b) the Contractor and the DTI will sign the NIP obligation agreement;

(c) the Contractor will submit a performance guarantee to the DTI;

(d) the Contractor will submit a business concept for consideration and approval by the DTI;

(e) upon approval of the business concept by the DTI, the Contractor will submit detailed business plans outlining the business concepts;

(f) the Contractor will implement the business plans; and

(g) the Contractor will submit bi-annual progress reports on approved plans to the DTI.

4.2 The NIP obligation agreement is between the DTI and the successful Tenderer (Contractor) and, therefore, does not involve the purchasing institution

Tender number …… Closing date:……

Name of Tenderer……

Postal address ……

……

Signature…….... Name (in print) …….

Date…….

1. The Bidder is required by law to prepare annual financial statements for auditing, their audited annual financial statements:

   i) for the past three years; or
   ii) since their establishment or established during the past three years.

Indicate whether these have been included in the Bid. Yes/No …….

2. Does the Bidder have any undisputed commitments for Municipal services towards a municipality or other service provider in respect of which payment is overdue for more than 30 days?

NO □ YES □

If so, state particulars: ……

……

……

3. Has any Contracts been awarded to the Bidder by an organ of state during the past five years?

NO □ YES □

If so, state particulars:
……

……

……

4. Has there been any material non-compliance or dispute concerning the execution of such Contract?

NO □ YES □

If so, state particulars:

……

……..

……...

5. Is any portion of the goods or services expected to be sourced out from outside the Republic?

NO □ YES □

If so, state what portion and whether any portion of payment from the Municipality is expected to be transferred out of the Republic.

……

……

Signature of Bidder: ……..

Date: ……

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 Tenderer

T2.2.14 FORM N: COMPULSORY ENTERPRISE QUESTIONNAIRE

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

Section 1: Name of enterprise: . . . .

Section 2: VAT registration number, if any: . . . .

Section 3: CIDB registration number, if any: . . . . . .

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

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

Section 5: Particulars of companies and close corporations

Company registration number . . . .

Close corporation number . . . .

Tax reference number . . . .

Section 6: Record in the service of the state

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

☐ a member of any municipal council ☐ a member of any provincial legislature ☐ a member of the National Assembly or the National Council of Province ☐ a member of the board of directors of any municipal entity ☐ an official of any municipality or municipal entity	☐ an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999) ☐ 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 sole proprietor, partner, director, manager, principal shareholder or stakeholder	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

*insert separate page if necessary

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

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

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

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

*insert separate page if necessary

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

i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order;

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

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

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

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

Signed		Date	
Name		Position	
Enterprise name			

MBD 2

T2.2.15 FORM O: TAX CLEARANCE REQUIREMENTS

IT IS A CONDITION OF BIDDING THAT -

1. The taxes of the successful bidder must be in order, or that satisfactory arrangements have been made with the Receiver of Revenue to meet his / her tax obligations.

2. The attached form “Application for Tax Clearance Certificate (in respect of bidders)”, must be completed in all respects and submitted to the Receiver of Revenue where the bidder is registered for tax purposes. The Receiver of Revenue will then furnish the bidder with a Tax Clearance Certificate that will be valid for a period of twelve (12) months from date of issue. This Tax Clearance Certificate must be submitted in the original together with the bid. Failure to submit the original and valid Tax Clearance Certificate may invalidate the bid.

3. In bids where Consortia / Joint Ventures / Sub-Contractors are involved each party must submit a separate Tax Clearance Certificate. Copies of the Application for Tax Clearance Certificates are available at any Receiver’s Office.

MBD2/ Application for tax Certificate…

1. Name of taxpayer / bidder:……..

2. Trade name:……..

3. Identification number: | | | | | | | | | | | | |

4. Company / Close Corporation registration number: | | | | | | | | | |

5. Income tax reference number: | | | | | | | | | |

6. VAT registration number (if applicable): | | | | | | | | | |

7. PAYE employer's registration number (if applicable): | | | | | | | | | |

Signature of contact person requiring Tax Clearance Certificate:……...

Name:……

Telephone number:……Code:…… Number:…….

Address:……

……

DATE: 20_____ / _____ / _____

PLEASE NOTE THAT THE COMMISSIONER FOR THE SOUTH AFRICAN REVENUE SERVICE (SARS) WILL NOT EXERCISE HIS DISCRETIONARY POWERS IN FAVOUR OF ANY PERSON WITH REGARD TO ANY INTEREST, PENALTIES AND / OR ADDITIONAL TAX LEVIABLE DUE TO THE LATE- OR UNDERPAYMENT OF TAXES, DUTIES OR LEVIES OR THE RENDITION RETURNS BY ANY PERSON AS A RESULT OF ANY SYSTEM NOT BEING YEAR 2000 COMPLIANT.

[MBD 2]

MBD 4

T2.2.16 FORM P: DECLARATION OF INTEREST

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

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 evaluation/adjudication authority and/or take an oath declaring his/her interest

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

3.1 Full Name: ……

3.2 Identity Number: ……

3.3 Company Registration Number: ……

3.4 Tax Reference Number: ……..

3.5 Vat Registration Number: ……

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

3.6.1 If so, furnish particulars.

……

……

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

3.7.1 If so, furnish particulars

……

……

3.8 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

3.8.1 If so, furnish particulars

……

……

3.9 Are you, aware of any relationship (family, friend, other) between a 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

3.9.1 If so, furnish particulars

……

……

3.10 Are any of the company's directors, managers, principal shareholders or stakeholders in service of the state? YES / NO

3.10.1 If so, furnish particulars

……

……

3.11 Is any spouse, child or parent of the company's directors, managers, principal shareholders or stakeholders in service of the state? YES / NO

3.11.1 If so, furnish particulars

……

……

DECLARATION / CERTIFICATION

I, THE, UNDERSIGNED (NAME)

……

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

…….. ……

Signature Date

…… ……

Position Name of bidder

- MSCM Regulations: "in 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.

MBD 6.1

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 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**

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

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

(a) Price; and

(b) Specific Goals.

1.4 The maximum points for this tender are allocated as follows:

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

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

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

2. DEFINITIONS

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

any other method envisaged in legislation;

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

(c) **"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 PREFERENCE POINT SYSTEMS

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

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

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

3.2.1. POINTS AWARDED FOR PRICE

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

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

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 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)**	**Number of points claimed 90/10 system) (To be completed by the tenderer)**
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**	

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: .....

.....

.....

.....

MBD 8

T2.2.17 FORM Q- DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1. Any Bid may be rejected if that Bidder, or any of its directors have:

   - abused the Municipality's / Municipal entity's supply chain management system or committed any improper conduct in relation to such system;
   - been convicted for fraud or corruption during the past five years;
   - willfully neglected, reneged on or failed to comply with any government, Municipal or other public sector Contract During the past five years; or
   - been listed in the Register for Bid Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

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

Item	Question	Yes	No
2.1	Is the Bidder any of its directors listed on the National Treasury's database as a company or persons prohibited from doing business with the public sector? (Companies for persons who are listed on this database were informed in writing of this restriction by the National Treasury after the *audi alteram partem* rule was applied).	Yes □	No □
2.1.1	If so, furnish particulars:		
2.2	Is the Bidder or any of its directors listed on the Register for Bid Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? (To access this Register enter the National Treasury's website, www.treasury.gov.za , click on the icon "Register for Bid Defaulters" or submit your written request for a hard copy of the Register to facsimile number (012)3265445)	Yes □	No □
2.2.1	If so, furnish particulars:		
2.3	Was the Bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes □	No □
2.3.1	If so, furnish particulars:		
2.4	Does the Bidder or any of its directors owe any Municipal rates and taxes or Municipal charges to the Municipality / Municipal entity, or to any other Municipality / Municipal entity, that is in arrears for more than three months?	Yes □	No □
2.4.1	If so, furnish particulars:		

Item	Question	Yes	No
2.5	Was any Contract between the Bidder and the Municipality / Municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or to comply with the Contract ?	Yes □	No □
2.5.1	If so, furnish particulars:		

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME) …….. CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM TO BE 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

T2.2.18 FORM R: CERTIFICATE OF INDEPENDENT BID DETERMINATION

MBD 9

1 This Municipal Bidding Document (MBD 9) 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 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:

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

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

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

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

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

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:
GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C
in response to the invitation for the bid made by:
SEKHUKHUNE DISTRICT MUNICIPALITY

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

I certify, on behalf of:_____that:
(Name of 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.

MBD 9

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 Contract s, 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 .

T2.2.19 FORMS: LOCALITY

Attach proof of address

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

Reference no: SK8/3/1- 06/2023/24

PORTION 2: AGREEMENTS AND CONTRACT DATA

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C1.1 Form of Offer and Acceptance

Offer

The employer, identified in the acceptance signature block, has solicited offers to enter into a Contract in respect of the following works: **GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C**,

REFERENCE NUMBER: SK8/3/1- 06/2023/24

The Bidder, 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 Bidder, deemed to be duly authorized, signing this part of this form of offer and acceptance, the Bidder 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 Bidder before the end of the period of validity stated in the tender data, whereupon the Bidder becomes the party named as the Contractor in the conditions of Contract identified in the Contract Data.

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

Name . . . . . .

Capacity . . . . . .

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

. . . . . .

. . . . . .

Name and signature of witness . . . . .

Acceptance

By signing this part of this form of offer and acceptance, the employer identified below accepts the Bidder'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 Bidder's offer shall form an agreement between the employer and the Bidder upon the terms and conditions contained in this agreement and in the Contract that is the subject of this agreement.

The terms of the Contract, are contained in:

Part C1: Agreements and Contract Data, (which includes this agreement)
Part C2: Pricing data
Part C3: Scope of work.
Part C4: Site information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts 1 to 4 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 Bidder 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.

The Bidder 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. Failure to fulfill any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the Bidder receives one fully completed original copy of this document, including the schedule of deviations (if any). Unless the Bidder (now Contractor) within five working days of the date of such receipt notifies the employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding Contract between the parties.

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

Name . . . . . .

Capacity . . . . . .

for the Employer Sekhukhune District Municipality
Corner Riebeeck and Chris Wiid Street
Private Bag 8611
Groblersdal
0470

Name and signature of witness . . . . . .

. . . . . .

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 Bidder's covering letter shall not be included in the final Contract Document. Should any matter in such, letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of, offer and acceptance, the outcome of such agreement shall be recorded here;

3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the Contract shall also be recorded here;

4. Any change or addition to the tender documents arising from the above agreements and recorded here shall also be incorporated into the final draft of the Contract .

1 Subject . . . . . .
Details . . . . . .
. . . . . .
. . . . . .
. . . . . .
2 Subject . . . . . .
Details . . . . . .
. . . . . .
. . . . . .
. . . . . .
3 Subject . . . . . .
Details . . . . . .
. . . . . .
. . . . . .
. . . . . .
4 Subject . . . . . .

Details . . . . . .

. . . . . .

. . . . . .

. . . . . .

5 Subject . . . . . .

Details . . . . . .

. . . . . .

. . . . . .

. . . . . .

By the duly authorised representatives signing this agreement, the employer and the Bidder 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 changes to the terms of the offer agreed by the Bidder 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 Bidder of a completed signed copy of this Agreement shall have any meaning or effect in the Contract between the parties arising from this agreement.

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

REF: SK8/3/1- 06/2023/24

C1.2 CONTRACT DATA

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C1.2.4	VARIATIONS AND ADDITIONS TO THE GENERAL CONDITIONS OF CONTRACT (SPECIAL CONDITIONS OF CONTRACT)……..	81

C1.2 Contract Data

C1.2.1 GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract for Construction Works Third Edition, 2015, published by the South African Institution of Civil Employer's Agenting, Private Bag X200, Halfway House, 1685 is applicable to this Contract. Copies of these conditions of Contract may be obtained from *www.saice.org.za*.

Each party to the Contract shall purchase its own copy of the GCC 2015 that applies to this Contract, available from its publisher:

South African Institution of Civil Engineering
Private Bag X200
Halfway House
1685
South Africa

Tel +27 (0)11 805 5947

Note 1

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

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purpose of interpretation, the priority of the documents shall be in accordance with the following order of precedence:

(a) The Form of Offer and Acceptance.
(b) Amendments to the General Conditions of Contract within the Contract Data.
(c) Additional conditions to the General Conditions of Contract within the Contract Data.
(d) Corrigenda to the General Conditions of Contract.
(e) The General Conditions of Contract.
(f) The Specifications, Drawings, Schedules and other documents forming part of the Contract (in that order) contained in the Scope of Work and the Site Information.

If any ambiguity or discrepancy is found in the documents, the Engineer needs to be contacted to issue any necessary clarification or instruction.

Note 2

Certain pro-forma forms and pro-forma agreements contained in the GCC 2015 have been adapted for this particular Contract. Those pro-forma forms and pro-forma agreements contained in the GCC 2015 do not apply where replaced by similar pro-forma forms and pro-forma agreements in this document.

Each item of data given below is cross-referenced to the clause in the General Conditions of Contract for Construction Works to which it mainly applies.

C.1.2.2: Contract Data completed by the Employer

Clause	Data
1.1.1.15 1.2.1.2	The name of the Employer is the Sekhukhune District Municipality The address of the Employer is: Address (physical): Riebeeck Street and Chris Wiid Street Bareki Mall Address (postal): Private Bag X8611 Groblersdal 0470 Telephone: 013 262 7535
1.1.1.16 1.2.1.2	The name of the Employer's Agent is: HWA Engineers and Project Managers The address of the Employer's Agent is: Address (physical): 24A Rissik Street Polokwane 0700 Address (postal): P.O Box 3472 Polokwane 0700 Telephone: 015 297 5906 Facsimile: (086) 246 0744 Email: admin@hwaeng.co.za
1.1.1.14	The works shall be completed within 12 months exclusive of year end break.
1.1.1.27	The Pricing Strategy is *Re-measurement Contract*
3.1.3	The Employer's Agent is required to obtain the specific approval of the Employer before executing any of the following functions or duties: 1. Nominating the Employer's Agent's Representative in terms of cl 3.3 2. Delegation of Employer's Agent's Representative authority in terms of cl 3.3.4 3. Providing consent for Sub-Contract ing part of the Contract in terms of cl 4.4.2 4. The issuing of further drawings or instructions in terms of cl 5.9.2 5. The issuing of instructions for dealing with fossils and the like in terms of cl 4.7. 6. Authorizing the Contractor to repair and make good excepted risks in terms of cl 8.3. 7. The issuing of a variation order in terms of cl 6.3. 8. Issuing of instructions to carry out work on a day work basis in terms of cl 6.5. 9. Granting permission to work during non-working times in terms of cl 5.8.1. 10. Suspend the progress of the works in terms of cl 5.11.2. 11. The issuing of an instruction to accelerate progress in terms of cl 5.12.4. 12. The reduction of a penalty for delay in terms of cl 5.13.2 13. The determination of additional or reduced costs arising from changes in legislation in terms of cl 6.8.4. 14. The giving of a ruling on a Contractor's claim in terms of cl 10.1.5 15. The agreeing of an extension to the 28 period in terms of cl 10.1.5.1

	16. The inclusion of credits in the next payment certificate in terms of cl 10.1.5.2 17. The agreeing of the adjustment of the sums for general items in terms of cl 5.12.3
4.9.1	The Contractor shall deliver to the Employers Agent's, on a monthly basis, a detailed inventory of Construction Equipment kept on Site, full particulars given for each day of the month. Distinction shall be made between Owned Equipment and Hired Equipment as well as Equipment in working order and Equipment out of order. Such inventory shall be submitted by the seventh day of the month following the month to be reported.
4.10.2	The Contractor shall deliver to the Employers Agent's, on a monthly basis, a return in detail of supervisory staff and the number of categorized classes of labour employed each day for the said period by the Contractor for execution of the Contract. Such return shall be submitted by the seventh day of the month following the month to be reported.
5.3.1	The documentation required before commencement with Works execution are: • Health and Safety Plan (Refer to Clause 4.3) • A signed Agreement between the Employer and the Contractor for the Works to be completed by the Contractor in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act (Act No.85 of 1993) and the Construction Regulations promulgated thereunder (Refer to Clause 4.3). • Proof of payment to the Employer, that the Contractor has paid all contributions required in terms of the Compensation for Occupational Injuries and Diseases Act, No 130 of 1993 (Refer to Clause 4.3). • Initial programme (Refer to Clause 5.6). • Security (Refer to Clause 6.2). • Insurance (Refer to Clause 8.6).
5.3.2	The time to submit the documentation required before commencement with Works execution is 14 days.
5.4.2	The access and possession of Site shall not be exclusive to the Contractor but shall be as set out elsewhere in the Contract.
5.8.1	The non-working Days are Saturdays and Sundays. The special non-working Days are: Statutory public holidays; and All annual year-end shutdown periods as recommended by the South African Federation of Civil Engineering Contractors (SAFCEC), and which commence after the Commencement Date and which commence before the Due Completion Date.
5.13.1	The penalty for failing to complete the Works is 0,1 percent of Contract price per calendar day.
5.14.5.2	The Defects Liability Period is 12 months from the issue of a Certificate of Completion.
5.16.3	The latent defect period is 10 years, commencing on the Day after the date of certification of Practical Completion.
6.8.2	Contract Price Adjustment: The Contract shall be subject to Contract Price Adjustment. The value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule included in the General Conditions of Contract. Contract Price Adjustment Factor = $(1 - x)\left[\frac{aLt}{Lo} + \frac{bPt}{Po} + \frac{cMt}{Mo} + \frac{dFt}{Fo} - 1\right]$ rounded off to the fourth decimal place.

	The value of "x" is 0,15 The values of the coefficients are: a = 0.25 Labour b = 0.3 Contractor's equipment c = 0.35 Material d = 0.1 Fuel The province wherein the larger part of the Site is located is Limpopo. The applicable industry for the Producer Price Index for material is Civil Engineering The area for the Producer Price Index for fuel is Limpopo area The base month is a month prior to tender closure.
	The percentage allowance to cover overhead charges is: 50 per cent for labour; and 15 per cent for materials
6.8.3	Price adjustments for variations in the costs of special materials are not allowed.
6.10.1.5	The percentage advance on materials not yet built into the Permanent Works is 80%. Proof of ownership is required.
6.10.3	The limit of retention money is 10% of the value of the Contract Price. A Retention Money Guarantee not allowed

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 a maximum of 10% (ten percent) of the Contract Sum.
8.6.1.3	The limit of indemnity for liability insurance is equal to the contract amount.
10.5.1	Dispute resolution shall be by standing adjudication, use GCC 2015, Appendix 5.
10.7.1	The determination of disputes shall be by arbitration.
	Payment for labour-intensive component of the works *Payment for works identified in the Scope of Works as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the Scope of Work. Any payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict.*
	Linkage of payment for labour-intensive component of works to submission of project data *The Contractor's payment invoices shall be accompanied by labour information for the corresponding period in a format specified by the employer. If the contractor chooses to delay submitting payment invoices, labour returns shall still be submitted as per frequency and timeframe stipulated by the Employer. The contractor's invoices shall not be paid until all pending labour information has been submitted.*
	Applicable Labour Laws *The current Ministerial Determination (also downloadable at www.epwp.gov.za), Expanded Public Works Programmes, issued in terms of the Basic Condition of Employment Act of 1997 by the Minister of Labour in Government Notice, shall apply to works described in the scope of work as being labour-intensive and which are undertaken by unskilled workers.*

C.1.2.3 Part 2: Data provided by the Contractor

<table>
<tr><td>Clause</td><td></td></tr>
<tr><td>1.1.1.9
1.2.1.2</td><td>The name of the Contractor is. . . . . ..
The address of the Contractor is:
Address (physical): . . . . . .
. . . . . .
. . . . . .
Address (postal): . . . . . .
. . . . . .
. . . . . .
Telephone: ……... . . . . .
Facsimile: …….. . . . . .</td></tr>
<tr><td>6.8.3</td><td>The variation in cost of special materials is:
<table><tr><td rowspan="2">Special material</td><td colspan="2">Unit on which variation will be determined</td><td>Price for base month ex-factory, excluding transport, labour or any other costs.</td></tr><tr><td>Containers</td><td>Delivered in bulk</td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table>*State unit in appropriate column</td></tr>
</table>

C.1.2.4. Variations to the General Conditions of Contract

Clause	Data
2.5.1	Cession *Amend Clause 2.5.1 as follows:* *Delete the words* "without the written consent of the other"
5.14.5.1	Consequences of Completion *Amend Clause 5.14.5.1 as follows:* *In the second line, substitute the word* 'Guarantor' *with* 'Contractor'.
6.2	Security *Replace Sub-Clauses 6.2.1 and 6.2.2 with:* "The Contractor shall deliver to the Employer within such time as may be stated in the Contract Data, a Demand Guarantee, of an Insurance Company registered in terms of the Short-term Insurance Act (Act 53 of 1998) or of a registered Commercial Bank, in a sum equal to the amount stated in the Contract Data. The Demand Guarantee shall be issued by an entity subject to the approved of the Employer, and shall conform in all respects to the format contained in the Contract Data. The security to be provided by the Contractor shall be a Demand Guarantee of 10% of the Contract Sum. Wherever a joint venture constitutes the Contract ing party, the Demand Guarantee shall be issued on behalf of the joint venture. Failure to produce an acceptable Demand Guarantee within the period stated in the Contract Data, is a fundamental breach of Contract, entitling the Employer to cancel the Contract by due notice in terms of Clause 9.2 with specific reference to Sub-clause 9.2.2.5 as amended in the Contract Data."
6.3	Variations *Amend Clause 6.3, as follows:* *In the first paragraph, third line, after the words* "or for any reason appropriate"*, add the phrase* ", including the limiting of Contract expenditure so as not to exceed the Employer's budgeted project funding, " *Add the following phrase to the last paragraph of Clause 6.3.1.6, after the words* "ascertaining the amount of the Contract Price": ", and no such variation shall give reason for consideration of any claim in terms of Clause 6.11."
6.3.2	Orders for Variations to be in writing Omit the words "Provided that" under Clause 6.3.2 and omit Clause 6.3.2.1.

6.9.2	Definition of "materials" *Amend Clause 6.9.2, as follows:* *Substitute the word* 'plant*' with* 'Plant'.
6.10.1	Interim Payments *Amend Clause 6.10.1.5 as follows:* *In the third line, add the words* 'not yet' *before the words* 'built into'
6.10.5	Payment of retention money *Amend Clause 6.10.5 as follows:* *In the second line, add the words '*, if any,*' after the words '*Defects Liability Period'
6.10.6	Set-off and delayed payments *Amend Clause 6.10.6.2 as follows:* *Delete the words '*Contractor's Bank*' and substitute with the words '*Employer's Bank*'*
6.11	Variations exceeding 15 per cent *Replace the marginal heading with:* "Variations exceeding 20 per cent" *Replace* "15 per cent" *with* "20 per cent" *in the text of this Sub-Clause*
7.8.2	Cost of making good of defects *Amend Clause 7.8.2.1 as follows:* *In the first line, correct the spelling of '*therefore*'.*
8.3.1	Excepted risks *Amend Clause 8.3.1.12 as follows:* *In the second line, delete the words '*Employer or any of their*' and substitute with '*or any of its'.
8.6.6	Contractor to produce proof of payment "The Contractor shall before commencement of the Works produce to the Employer's Agent: 8.6.6.1 The policies by which the insurances are effected, 8.6.6.2 Proof that due payment of all premiums there under, covering the full required period has been made, and 8.6.6.3 Proof of continuity of the policies for the required period.

	Should, during the currency of the Contract, the required period of insurance be extended for any reason, the Contractor shall timeously extend (so as to maintain) the said insurances for the full extended duration. The Employer's Agent shall be empowered to withhold all payment certificates until the Contractor has complied with his obligations in terms of this Clause 8.6.6."
8.6.7	Remedy on Contractor's failure to insure *Delete sub-clause 8.6.7 and substitute with:* "Failure on the part of the Contractor to effect and keep in force any of the insurances referred to in Clause 8.6.1 and its sub-clauses, is a fundamental breach of Contract, entitling the Employer to cancel the Contract by due notice in terms of Clause 9.2 and with specific reference to sub-clause 9.2.2, as amended in the Contract Data."
9.1.2	State of emergency *In the <u>fourth</u> line, delete the words '*supply of*' and substitute with '*availability of*'.*
9.2	Termination by Employer *Delete the contents of Clause 9.2 and substitute with:* "9.2.1 The Employer may terminate the Contract by written notice to the Contractor if: 9.2.1.1 Sequestration of the Contractor's estate is ordered by a Court with due jurisdiction, or 9.2.1.2 The Contractor publishes a notice of surrender or presents a petition for the surrender of his estate as insolvent, or makes a compromise with his creditors, or assigns in favour of his creditors, or agrees to carry out the Contract under the supervision of a committee representing his creditors, or (being a company) goes into liquidation, whether provisionally or finally (other than a voluntary liquidation for the purpose of amalgamation or reconstruction), or if the Contractor assigns the Contract without having first obtained the Employer's consent in writing, or if execution is levied on his goods, or 9.2.1.3 The Contractor, or anyone on his behalf, or in his employ, offers to any person in the employ of the Employer or the Employer's Agent, a gratuity or reward or commission, or 9.2.1.4 The Contractor furnished materially inaccurate information in his Tender, which had a bearing on the award of the Contract, or 9.2.1.5 The Contractor has abandoned the Contract. 9.2.2If the Contractor: 9.2.2.1 Has failed to commence the Works in terms of Clause 10 hereof, or has suspended the progress of the Works for fourteen (14) days after receiving from the Employer's Agent written notice to proceed, or 9.2.2.2 Has failed to provide the Guarantee in terms of Clause 7 within the time stipulated in the Contract Data, or

	9.2.2.3 Has failed to proceed with the Works with due diligence, or 9.2.2.4 Has failed to remove materials from the Site or to pull down and replace work within fourteen (14) days after receiving from the Engineer written notice that the said materials or work have been condemned and rejected by the Employer's Agent in terms of these conditions, or 9.2.2.5 Is not executing the Works in accordance with the Contract, or is neglecting to carry out his obligations under the Contract, or 9.2.2.6 Has, to the detriment of good workmanship or in defiance of the Employer's Agent's instructions to the contrary, sublet any part of the Contract, or 9.2.2.7 Has assigned the Contractor any part thereof without the Employer's consent in writing, then the Employer may give the Contractor 14 days' notice to rectify the default, and if the Contractor fails to rectify the default in said 14 days, then, without further notice, notify the Contractor in writing of the termination of the Contract and expel the Contractor and order the Contractor to vacate the site within 24 hours of issue of the Notice of Termination and to hand the Site over to the Employer, and the Employer may then enter upon the Site and the Works without affecting the rights and powers conferred on the Employer or the Employer's Agent by the Contract and the Employer may himself complete the Works or may employ another Contractor to complete the Works, and the Employer or such other Contractor may use for such completion so much of the Construction Equipment, Temporary Works and materials brought onto the Site by the Contractor as the Employer may think proper, and the Employer may at any time sell any of the said Construction Equipment, Temporary Works and unused materials and apply the proceeds of sale towards payment of any sums that may be due or become due to the Employer by the Contractor under the Contract . In such circumstances the Contractor shall forthwith vacate the Site and shall not be entitled to remain on the Site on the grounds that he is entitled to do so on a right of retention until amounts due to him have been paid, neither will the Contractor be entitled to any further payments in terms of this Contract. 9.2.3 If the Contractor, having been given notice to rectify a default in terms of 9.2.2 above, rectifies said default, but later repeats the same or substantially the same default, then the Employer may notify the Contractor of the immediate termination of the Contract, and proceed as stated in the paragraph following the word 'writing' in Clause 9.2.2.7 above. 9.2.4 Should the amounts that the Employer must pay to complete the Works, exceed the sum that would have been payable to the Contractor on due completion by him, then the Contractor shall upon demand pay to the Employer the difference, and it shall be deemed a debt due by the Contractor to the Employer and shall be recoverable accordingly. Provided that should the Contractor on demand not pay the amount of such excess to the Employer, such sum may be determined and deducted by the Employer from any sum due to or that may become due to the Contractor under this or any previous or subsequent Contract between the Contractor and the Employer."

C.1.2.4.1 Additional clauses to the General Conditions of Contract:

Clause	Data
1.1	Definitions *Add the following at the end of Sub-Clause 1.1.1:*
1.1.1.35	"Client", as used in the Occupational Health and Safety Act - Construction Regulations, means Employer.
1.1.1.36	"Principal Contractor", as used in the Occupational Health and Safety Act - Construction Regulations, means Contractor.
4.12	Contractor's superintendence *Add the following sub-clause 4.12.4 to Clause 4.12:* "Where a form is included in the Contract Data for this purpose, the Tenderer shall fill in the name of the person he proposes to entrust with the post of Construction Manager on this Contract in the space provided therefore. Previous experience of this person on work of a similar nature during the past five (5) years is to be entered on the form. The Contractor's Construction Manager shall be on Site at all times when work is being performed. The person shall be subject to approval of the Employers Agent's in writing and shall not be replaced or removed from Site without the written approval of the Employers Agent'.
5.6	Programme *Add the following sub-clause 5.6.6 to Clause 5.6:* "Failure on the part of the Contractor to deliver to the Employers Agent, the • programme of the Works in terms of Clause 5.6.1 and • supporting documents in terms of Clause 5.6.2 Within the period stated in the Contract Data, shall be sufficient cause for the Employer's Agent to retain 25 per centum of the value of the Fixed Charge and Value-related items in assessment of amounts due to the Contractor, until the Contractor has submitted aforementioned first Programme of the Works and Supporting Documents".
5.9.7	Employers Agent's to approve Contractor's Designs and Drawings *Add the following at the end of Sub-Clause 5.9.7* "All designs, calculations, drawings and operation and maintenance manuals shall be fully endorsed by a third party registered engineer, accomplished in such specific field of practice and the cost thereof shall be borne solely by the Contractor. Once the alternative design has been approved, the Contractor shall indemnify and hold harmless the Employers Agent's, the Employer, their agents and assigns, against all claims howsoever arising out of the said design, whether in Contractor delict".

5.11	Suspension of the Works *Add the following sub-clause 5.11.7 to Clause 5.11:* "If the Contractor does not receive from the Employer the amount due under an Interim Payment Certificate within 28 days after expiry of the time stated in sub-clause 6.10.4 within which payment is to be made (except for deductions in accordance with sub-clauses 6.10.1.6 and 6.10.1.7), the Contractor may, after giving 14 days' notice to the Employer, suspend the progress of the Works. The Contractor's action shall not prejudice his entitlements to a claim in terms of Clause 10.1 and to cancellation of the Contract in terms of Clause 9.3. If the Contractor subsequently receives full payment of the amount due under such Interim Payment Certificate before giving a notice of cancellation of the Contract, the Contractor shall resume normal working as soon as is reasonably practicable."
5.12	Extension of Time for Practical Completion *Add the following at the end of Sub-Clause 5.12.2.2:* "The extension of time to be allowed due to abnormal rainfall shall be calculated separately for each calendar month or part thereof in accordance with the following formula: $$V = (Nw - Nn) + \left(\frac{Rw - Rn}{x}\right)$$ where V = Extension of time in calendar days for the calendar month under consideration Nw = Actual number of days during the calendar month on which a rainfall of 10 mm or more has been recorded Nn = Average number of days in the relevant calendar month, as derived from existing rainfall records, as stated in the Site Information, on which a rainfall of 20mm or more has been recorded for the calendar month. Rw = Actual recorded rainfall for the calendar month Rn = Average rainfall for the calendar month, as derived from existing rainfall records x = 20 The rainfall records which shall provisionally be accepted for calculation purposes are: Based on records taken at: Rainfall Station: Grobersdal Year of record: 2020

Month	The average number of days	Average Rainfall
January	2.5	80
February	2.3	57
March	2	49
May	0.9	25
May	0.2	9
June	0.1	2
July	0	4
August	0.1	6
September	0.3	11
October	1.3	37
November	2.2	65
December	3.2	7

The factor (Nw - Nn) shall be considered to represent a fair allowance for days during which rainfall exceeds 10 mm and the factor (Rw - Rn)/x shall be considered to represent a fair allowance for those days when rainfall does not exceed 10 mm but wet conditions prevent or disrupt work.

The total extension of time shall be the algebraic sum of all monthly totals for the contract period, but if the algebraic sum is negative the time for completion shall not be reduced due to subnormal rainfall. Extensions of time for a part of a month shall be calculated using pro rata values of Nn and Rn."

For this project the rainfall formula will only apply as background information, or dispute resolution. Extension of time for rainfall will only be granted on Actual Delays experienced; noted and agreed upon by the engineer.

6.10 *Add the following at the end of Sub-Clause 6.10.1:*

"The Contractor shall complete the 'Contractor's Monthly Report Schedule', which pro forma documentation is obtainable from the Employer's Agent. Pursuant to Sub-Clause (1), these, duly signed by all concerned, together with the Contractor's statement and a VAT invoice in original format are to be submitted to the Employer's Agent. Issue by the Employer's Agent to the Employer and Contractor of any signed payment certificate is conditional to this information being fully endorsed, accurately and timeously submitted to the Employer's Agent".

"All documentary evidence of such materials shall be unambiguous with respect to ownership having fully passed to the Contractor on or before the date of submittal of the Contractor's monthly statement.

Should the Contractor fail to supply unambiguous documentary evidence, he shall, prior to submittal of his monthly statement, deliver to the Employer a Guarantor Guarantee in the form contained in the Appendices to the Contract Data."

9.3	Termination by the Contractor *Add the following at the end of Sub-Clause 9.3:*
	9.3.5 “In addition to, or as an alternative to the rights to termination contained in this Clause 9.3, the Contractor may notify the default to the Employer, with a copy to the Employer’s Agent, and if the default is not rectified within 10 days the Contractor may suspend progress of the works until a date 7 days after the default is rectified. The Contractor shall be entitled to extension of time to the extent of delay caused by or resulting from such suspension, and to payment of additional costs caused by or resulting from the suspension. Such extension of time and additional costs shall be promptly ascertained by the Employer’s Agent, who shall then grant the extension of time and include the additional costs in all future payment certificates. Such suspension, extension of time and/or payment of additional costs, shall not prejudice the Contractor’s rights to cancel the Contract .”

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1A

C1.3 PERFOMANCE GUARANTEE (not to be completed at tender stage)

Must be exactly as APPENDIX 3: General Conditions of Contract For Construction Works, Third Edition, 2015.

The Expiry Date shall be three (3) months after the Practical Completion Date. The fixed Performance Guarantee Option shall apply

C1.4 RETENTION GUARANTEE

NOT ALLOWED

C1.4 OCCUPATIONAL HEALTH AND SAFETY AGREEMENT

This agreement is mandatory for all Contractors appointed by the Sekhukhune District Municipality or any other institution that do work for or on behalf of Municipality.

This agreement is between:
Sekhukhune District Municipality
(HEREINAFTER REFERRED TO AS THE MUNICIPALITY)

herein represented by _____

in his capacity as _____

of the Municipality, he being duly authorised thereto hereinafter

and

_____
(hereinafter referred to as the Mandatory)

herein represented by _____

in his capacity as _____

of the Mandatory, he being duly authorised thereto

WHEREAS:

a) The Municipality and the mandatory entered into a written, alternatively oral agreement on the……..Day of ……20…….. in terms of which the Mandatory undertook to carry out the following work for the Municipality, viz. (*Construction of bulk pipelines.)*

   _____

   _____

   _____
   (The said Contract work is hereinafter referred to as the Work)

b) The Occupational Health and Safety Act, Act 85 of 1993 as amended (hereinafter referred to as the Act) contains amongst others certain provisions with regard to the health and safety of people at work and in connection with the usage of plant and machinery, as well as the protection of other persons than persons at work against hazards to health and safety that originates from or in connection with the activities of persons at work.
c) Section 37(2) of the Act makes provision for the exclusion by the parties, by way of a written agreement, of supposition and accompanying liability of the Municipality as stipulated in section 37(1) of the Act.
d) The parties have reached consensus with regard to the terms and conditions to which they agree in terms of the provisions of section 37(2) of the Act.

1. DEFINITIONS

1.1 CONTRACTOR Means the “Contractor” as defined in the “Principal Contract”.

Annexed hereto in his capacity as mandatory.

1.2 MANDATORY Includes an agent, contractor or subcontractor for work to be done or service rendered, but without derogating from his status in his own right as an employer of people or user of equipment, machinery, tools or materials.

1.3 THE PRINCIPAL CONTRACT Means the contract annexed hereto as annexure “A”.

1.4 COUNCIL Means the Sekhukhune District Municipality

1.5 RISK CONTROL OFFICER A person appointed in writing by Council.

1.6 Any definitions contained in any Statute hereinafter mentioned shall have the meaning allocated to it by the specific statute.

2. OBJECTIVE

2.1 Whereas Council and the Contractor have entered into a contract for service (work) as fully indicated in the “Principle Contract” and whereas the “Contractor” agreed to indemnify Council against the risks stated hereunder whether foreseeable or not, and, whereas it is agreed between the parties that it is of cardinal importance to safeguard both Council and the Contractor’s obligation in terms of relevant legislation as well as to extend the obligation as a company and/or legal person and/or person as an entity concerned with health, safety and the environment.

2.2 These rules are applicable to all contractors performing work for Council within the jurisdictional area of the Council and on any premises, which are owned, rented or developed by the Council.

2.3 The Council acts though those officials or persons who are generally or specifically charge with the responsibility, in terms of legislation, as well as any other official or person who is generally or specifically charged with the control and supervision of the project.

IT IS HEREBY AGREED AS FOLLOWS:

3. INDEMNITIES

3.1 The "Contractor" hereby indemnifies the "Council" against any loss in respect of all claims, proceeding, damages, costs and expenses arising out of any claim or proceeding pertaining to the non-compliance by the "Contractor" of any statutory requirements and/or requirements regarding the following Acts in particular pertaining to the provisions of:

3.1.1 The Occupational Health and Safety Act 85 of 1993 (as amended), including the Construction Regulations, 2014 as promulgated on 7 February 2014, in terms of Section 43 of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), in Government Gazette No. 25207 and Regulation Gazette No. 7721. See Annexure B.

3.1.2 The Health Act 63 of 1977.

3.1.3 Road Traffic Act 29 of 1989 (as amended).

3.1.4 Environment Conservation Act 73 of 1989.

3.1.5 The National Water Act 36 of 1998.

3.1.6 The Criminal Procedure Act 51 of 1977.

3.1.7 The Explosives Act 26 of 1956.

3.1.8 The Arms and Ammunition Act 75 of 1969.

3.1.9 Compensation for Occupational Injuries and Diseases Act 130 of 1993.

3.1.10 The Labour Relations Act 66 of 1995.

3.1.11 The Unemployment Insurance Act 30 of 1966 (as amended).

3.1.12 The Basic Conditions of Employment Act 75 of 1997 (as amended).

3.1.13 Standards Act 29 of 1993.

3.1.14 any statutory provisions in any act and/or any law or bylaw of any local government and/or any published official standard incorporated into any statute or bylaw relating to the completion of the work set out in the "Principal Contract".

3.1.15 Any other health and safety standard prescribed by the "Council".

3.2 The "Contractor" shall ensure that he familiarizes himself with the requirements of the above legislation and that he, his employees and any subcontractor will comply with all the statutory provisions contained in them.

3.3 The "Contractor" shall indemnify the "Council" in respect of any physical loss or damage to any plant, equipment or other property belonging to the "Contractor" or for which he is responsible and he hereby indemnifies the "Council" against any loss in respect of all claims, proceedings, damages, costs and expenses consequent upon the loss of or damage to any plant, equipment or other property belonging to, or which is the responsibility of, any subcontractor, agent or employee of the subcontractor.

3.4 The "Contractor" shall and hereby indemnifies the "Council" against any liability, loss, claim or proceedings whatsoever, whether arising in common law or by statute, consequent on personal injuries to or the loss of health or death of any person whosoever arising out of or in the course of or caused by the execution of the "Principal Contract".

3.5 The "Contractor" shall and hereby indemnifies the "Council" against any liability, loss, claim or proceedings consequent on loss of or damage to any movable or immovable property arising out of or in the course of or caused by the execution of the "Principal Contract" and due to any act or omission of the "Contractor", his agents, servants or subcontractors.

4. PERFORMANCE SAFE WORKING PRACTICE

4.1 The "Council" requires a high standard of safe work performance from all employees and expects that the standard be maintained by the "Contractor" within the "Council's" jurisdictional area or on its premises.

4.2 Irrespective of human considerations, the maintaining of these health and safety rules shall be the execution of the prescribed legal requirements. These rules are not to hinder the "Contractor" in rendering services or indemnify the "Contractor" from any legal responsibility to ensure healthy and safe work circumstances.

4.3 The "Council" shall assist the "Contractor" in any practical considerations to accommodate the healthy and safe execution of work and therefore require co-operation in the execution of these safety rules.

5. LOCK OUT PROCEDURE

5.1 When power or air driven machines or equipment, electrical apparatus or pipe lines are examined, repaired, adjusted, cleaned, lubricated or serviced in any other way than normal servicing, then all isolating switches, -levers, valves or appliances must be put in the "off" or "closed" position and locked.

5.2 Should more than one team work on a machine, then each person in control of a team, must put a separate lock on the switch, lever, valve or appliance.

6. CRANES, VEHICLES AND HOISTING

6.1 For each crane or hoisting equipment used, the "Contractor" must submit a valid and recent test certificate or other form of the last examination of the machine or equipment, to the "Council".

6.1.1 Only trained personnel with written permission and where determined by Law, with a valid driver's license, may be allowed to operate any electrical diesel or petrol driver overhead crane, hydraulic or electrical hoisting equipment, self-driven forklift, tractor or any other crane or vehicle. No employee of the "Contractor" may perform any overhead work or work on an overhead crane or hoisting equipment or work near cranes or crane rail, before:

i) An agreement was concluded with the "Council".
ii) Approval has been obtained from the "Council" to perform the work.
iii) All applicable danger – and warning symbolic signs are put into position, or exemption, if applied for, is in operation.

6.2 The "Contractor" shall be wholly responsible for any loss or damage to cranes, hoisting equipment, plant, machines or equipment brought onto the work site by the "Contractor"

7. MACHINE VALANCES, PROTECTION AND FENDING

7.1 No machine valances, protection or fending may be removed from machines, manholes, etc. without the written permission of "Council" if applicable exemption procedures were not appropriated.

8. SCAFFOLD, LADDERS, TOOLS AND EQUIPMENT

8.1 No equipment or appliance belonging to "Council" may be used without written permission from "Council".

8.2 Unless prior arranged, "Contractors" must bring sufficient tools and equipment to the site to finish the contract, including offices and storerooms. The mentioned equipment remains the responsibility of the "Contractor" with respect to loss, damage and theft.

8.3 In exceptional cases, where tools and equipment belonging to "Council" are used to finish the contract, the said equipment and tools are used on own risk and the "Contractor" indemnifies "Council" from any claims that may arise. The said indemnity must be in writing, as well as

information regarding the loan period, identification and condition of tools and equipment. The "Contractor" is responsible for the returning of said tools and equipment in the same condition or better. The "Contractor" is responsible to "Council" for any damage or excessive wear of such tools or equipment and material.

9EXCAVATIONS

9.1 Before any excavations commence, written permission must be obtained from "Council" to confirm the location of existing electrical cables, water pipes, etc.

9.2 All excavations and obstructions in floor, tar and dirt surfaces must be fenced effectively and safeguarded between sundown and sunup with a sufficient amount of red/yellow warning lights and symbolic signs.

9.3 The surrounding area must be kept clean, safe and tidy during excavation. Excess material may not obstruct unnecessarily.

9.4 If any property is in danger during excavation, it must be supported and the proposed support work must be submitted to the Department of Labour (OHS) and "Council" for approval.

9.5 Written permission must be obtained from "Council" to grant admittance to restricted areas as well as areas where dangerous or poisonous gases are present.

10. FIRST AID

10.1 The "Contractor" must provide and maintain a first aid box equipped according to legal requirement where more than (5) five persons are employed. The first aid box must be in the care of a person with a competency certificate from one of the following organizations:
(i)SA Red Cross Association;
(ii) St Johns Ambulance;
(iii) SA First Aid League; or
(iv)A person or organization approved by the Chief inspector for this purpose.

10.2 A visible notice must be put up on any work premises with the name of the person responsible for first aid. In an emergency "Council's" Ambulance / Fire Department or emergency services may be contacted at (013) 243 1659.

11. FLAMMABLE LIQUIDS

11.1 The "Contractor" shall be held responsible for the necessary precautionary fire prevention measures. No smoking signs must be put up where applicable. The "Contractor's" employees must be informed of "Council's" fire prevention measures and evacuation procedures.

12. COMPENSATION BY CONTRACTOR

12.1 The "Contractor" shall be held responsible for all loss of and damage to property, the death or injury of persons, the resultant loss or damage suffered as well as all law suits, claims, costs, charges, fines and expenses due to negligence, violation of statutory liability or neglect of the "Contractor" or the "Contractor's" employees.

13. TRANSGRESSION OF RULES AND MISBEHAVIOUR

13.1 The "Contractor" is warned that any act(s) leading to damage or loss of employees of the "Contractor" or the "Council" shall not be tolerated. The "Council" may (without any reason)demand that any employee of the "Contractor" be withdrawn from the principal "Contract" or site.

14. INCIDENT REPORTING

14.1 All incidents referred to in Section 24 of the Occupational Health and Safety Act and or other incidents shall be reported, by the "Contractor", to the Department of Labour, as well as to the "Council" and should such an incident take place outside normal working hours, on a Saturday, Sunday or Public holiday provided with a written report relating to any incident.

14.2 The "Council" will obtain an interest in the issue of any formal inquiry conducted in terms of the Occupational Health and Safety Act in any incident involving the "Contractor" and/or his employees and/or his subcontractors.

14.3 The "Contractor" undertakes to report to "Council" anything deemed to be unhealthy and/or unsafe and that he undertakes to verse his employees and/or subcontractors in this regard.

15. LIAISON AND SUPERVISION

15.1 The "Contractor" hereby undertakes to liaise on a regular basis with the designated Risk Control Officer and "Council" representative regarding any hazards or incidents that may be identified or encountered during the performance of the "Principal Contract".

16. SERVICE INTERRUPTION

16.1 Should any work done by the "Contractor" cause a possible interruption, written permission must be obtained from "Council", before such work commences. The "Contractor" may not switch on or off any compressed air, steam, oxygen, vacuum supply or electrical supply without written permission from the "Council".

17. CONFIDENTIALITY

17.1 The "Contractor" and his employees shall regard all data, documentation and information of the contract and related documentation as confidential.

17.2 Lost documentation/plans or related documentation shall immediately be reported in writing to the "Council".

17.3 The "Contractor" shall not put up any advertisements or billboard at the site without permission.

17.4 The "Contractor" shall not take photographs of the contract site or part thereof or any work process or part thereof, without written permission from the "Council", or have photographs taken, published or let it be published.

18. CONTRACT SITE AND PRESERVATION

18.1 Employees of the "Contractor" shall not be allowed entrance to the site unless a valid identity document, issued by "Council", is displayed. The mentioned documents shall only be valid for a limited period, where after it must be renewed.

19. COMPLETION OF WORK

19.1 The "Contractor" or his employees shall not leave the contract site before the "Council" is satisfied that the contract is completed according to the requirements and standards set out in the contract and that the working site is left in a satisfactory and safe condition.

20. LIQUOR, DRUGS, DANGEROUS WEAPONS AND FIREARMS

20.1 The "Contractor" shall ensure that no liquor, drugs, dangerous weapons or firearms be brought onto the premises.

21. SEARCHES

21.1 The “Contractor” and any person engaged in the contract work may at any time be searched by “Council” appointed security personnel and all packages, suitcases, etc. must be presented to the access control point for examination prior to them being brought onto the property or leaving the property.

22. GENERAL CONDITIONS

22.1 Notwithstanding anything to the contrary in this agreement, it is hereby specifically determined that the “Contractor-“

22.1.1 shall have acquainted himself and be conversant with the contents of all statutory provisions applicable to the health and safety of workers and other persons on the site including the execution of the work, and in particular the conditions contained in the Occupational Health and Safety Act, 1993 (Act 85/1993), and the regulations promulgated in terms thereof, and shall comply therewith meticulously and in all aspects and/or take care that it is complied with;

22.1.2 shall be obliged to immediately execute all instructions given to him by an authorized representative of “Council” in order to ensure and uphold the implementation and enforcement of the provisions referred to in sub-paragraph 1, to the satisfaction of the said representative;

22.1.3 shall indemnify the “Council” against any or all liability which may be incurred by the “Council” as a result of the omission of the “Contractor”, his employees, sub-contractors and/or representatives to comply with the provisions referred to in sub-paragraph 1, or to ensure that it shall be complied with;

22.1.4 shall undertake to pay upon demand any and/or all legal costs and other expenses which “Council” may have incurred as a consequence of any criminal charges or other proceedings pending against, or involving the “Council” as a result of the contravention or non-compliance by the “Contractor”, his employees, sub-contractors and/or representative of any of the statutory provisions referred to in sub-paragraph 1.

22.1.5 Should the “Contractor” neglect to immediately execute any health and safety written orders issued to him, or to his employee in charge of the works, in terms of the stipulations of sub-paragraph 2, the “Council” shall be entitled to suspend the execution of the works and take the necessary steps to execute or have such order executed. Under these circumstances the contractor shall be obliged to pay “Council”, upon demand, all costs and expenses incurred by “Council”, in order to execute or have the said orders executed.

22.1.6 Should the abovementioned steps not establish a healthy and safe work environment the “Council” will be entitled to terminate the contract without incurring any further costs or claims from the contractor?

23. “CONTRACTOR” IDENTIFICATION BOARD

23.1 The “Contractor” shall provide on any work premises a temporary identification board containing at all worksites the following information:

- Company name on behalf of which division/department the work is being done.
- The contact number and name of the person representing the “Contractor”.
- The contact number and name of the person representing “Council”

24. ACKNOWLEDGEMENT

24.1 The “Contractor” hereby acknowledges that he has read and received a copy of the “Principal Contract” and agrees to be bound by and undertakes to observe all the terms and conditions of the

"Principal Contract". This appointment is made in terms of Section 37(2) of the Occupational Health and Safety Act, 85 of 1993.

25. EXCEPTIONS AND OMISSIONS

_____

_____

_____

_____

_____

26. REMARKS

_____

_____

_____

_____

_____

_____

THE CONTRACTOR

SIGNED AT ……..…… ON THIS ……..… DAY OF ……...……...

WITNESSES:

…….. 1. .....
THE CONTRACTOR

2. ……

THE COUNCIL

SIGNED AT ……..…… …….ON THIS ……..…… DAY OF……...……

WITNESSES…… …….. 1. ……...
THE COUNCIL

2. …… ……...……

a) INDEMNITY CERTIFICATE

Contractor……

Employer:Sekhukhune District Municipality

Contract……

I/we ……

Hereafter the “Contractor”

“Contractor” hereby indemnifies the Sekhukhune District Municipality (Council) against any claim of whatever sort which may arise directly or indirectly from the execution by me/us of the above-mentioned contract and which may be instituted against “Council”, as well as of any loss or damage which the “Council” suffers or expenditure the “Council” incurs to prevent responsibility for such claim, loss or damage, whatever the cause of such claim may be or whatever loss or damage the “Council” suffers.

THUS, done and signed at …… on this……. Day

of……... 20…...

WITNESSES:

1. …….. ……..
CONTRACTOR

2. …….. ……
COUNCIL

b) ACKNOWLEDGEMENT CERTIFICATE

I, in my capacity as……..…… ……..

Duly authorized hereto ……..……..…representing

……..Contractors, acknowledge receipt of a copy of the Sekhukhune District Municipality's safety manual for contractors and the under mentioned person as my supervisor regarding all works and services which must be executed by the Contractor. The appointment is done in terms of the Occupational Health and Safety Act, 1993 (Act 85/1993).

SIGNED AT …….. ON…….. 20…...

I, ……..… accept the abovementioned appointment, and declare that I am familiar with the contents of the Sekhukhune District Municipality's Safety Manual for contractors.

CASUALTIES REGISTRATION NUMBER

_____

_____

_____

SIGNED AT …….. ON…….. 20…….

SIGNATURE:

WITNESSES: 1. ……..

2. ……..

A copy of this certificate shall be submitted to the "Council" before any work commences.

C1.5: Agreement with Adjudicator

This agreement is made on the.....day of ..... 20.....between: The Employer

(name of company / organisation) ..... of

(*address)*.....

.....and the Contractor

(name of company /organisation) .....

of (*address)*.....

.....(hereinafter called the Parties)

And

(name).....of *(address)*

..... (hereinafter called the Adjudicator)

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

and known as Contract No..... …….

(Contract title) .....

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:

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

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

3. 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.

4. 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.

5. 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:

(*Signature*)*:* ..... (*Signature*)*:* .....(*Signature*)*:* .....

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 on behalf of the Second Party in the presence of

the Adjudicator in the presence of

Witness: Witness: Witness:

(*Signature*).....(*Signature*).....(*Signature*).....

Name: ..... Name: ..... Name:.....

Address: ..... Address: ..... Address: .....

....

Date: ..... Date: ..... Date: .....

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

PROJECT DESCRIPTION: GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

PART C2.1 PRICING INSTRUCTIONS

C2.1 Pricing Instructions

1 The Bills of Quantities have been drawn up in accordance with the Standard System of Measuring Building Work (as amended) published and issued by the Association of South African Quantity Surveyors (Sixth Edition (Revised)), 1999. Where applicable the:

a) civil engineering work has been drawn up in accordance with the provisions of the latest edition of SANS 1200 Standardized Specifications for Civil Engineering Works.
b) mechanical work has been drawn up in accordance with the provisions of the Model Bills of Quantities for Refrigeration, Air-Conditioning and Ventilation Installations, published by the South African Association of Quantity Surveyors, July 1990).
c) electrical work has been drawn up in accordance with the provisions of the Model Bills of Quantities for Electrical Work, published by the South African Association of Quantity Surveyors, (July, 2005).

2 The agreement is based on the General Conditions of Contract for Construction Works Third Edition, 2015, published by the South African Institution of Civil Employer's Agenting. The additions, deletions and alterations to the General Conditions of Contract for Construction Works as well as the Contract specific variables are as stated in the Contract Data. Only the headings and clause numbers for which allowance must be made in the Bills of Quantities are recited.

3 Preliminary and general requirements are based on the various parts of SANS 1921, Construction and management requirements for works Contract s. The additions, deletions and alterations to the various parts of SANS 1921 as well as the Contract specific variables are as stated in the Specification Data in the Scope of Work. Only the headings and clause numbers for which allowance must be made in the Bills of Quantities are recited.

4 It will be assumed that prices included in the Bills of Quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.stanza.org.za or www.iso.org for information on standards).

5 The drawings listed in the Scope of Works used for the setting up these Bills of Quantities are kept by the quantity surveyor and can be viewed at any time during office hours up until the completion of the works.

6 Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted.

7 Where any item is not relevant to this specific Contract, such item is marked N/A (signifying “not applicable”)

8 The Contract Data and the standard form of Contract referenced therein must be studied for the full extent and meaning of each and every clause set out in Section 1 (Preliminary and General) of the Bills of Quantities

9 The Bills of Quantities is not intended for the ordering of materials. Any ordering of materials, based on the Bills of Quantities, is at the Contractor’s risk.

10 The amount of the Preliminary and General Section to be included in each monthly payment certificate shall be assessed as an amount prorated to the value of the work duly executed in the same ratio as the preliminaries bears to the total of prices excluding any contingency sum, the amount for the Preliminary and General Section and any amount in respect of Contract price adjustment provided for in the Contract.

11 Where the initial Contract period is extended, the monthly charge shall be calculated on the basis as set out in 10 but taking into account the revised period for completing the works.

12 The amount or items of the Preliminary and General Section shall be adjusted to take account of the theoretical financial effect which changes in time or value (or both) have on this section. Such adjustments shall be based on adjustments in the following categories as recorded in the Bills of Quantities:

a) an amount which is not to be varied, namely Fixed (F)
b) an amount which is to be varied in proportion to the Contract value, namely Value Related (V); and
c) an amount which is to be varied in proportion to the Contract period as compared to the initial construction period excluding revisions to the construction period for which no adjustment to the Contractor is not entitled to in terms of the Contract, namely Time Related (T).

13 Where no provision is made in the Bills of Quantities to indicate which of the three categories in 12 apply or where no selection is made, the adjustments shall be based on the following breakdown:

a) 10 percent is Fixed;
b) 15 percent if Value Related
c) 75 percent is Time Related.

14 The adjustment of the Preliminary and General Section shall apply notwithstanding the actual employment of resources in the execution of the works. The Contract value used for the adjustment of the Preliminary and General Section shall exclude any contingency sum, the amount for the Preliminary and General Section and any amount in respect of Contract price adjustment provided for in the Contract. Adjustments in respect of any staged or sectional completion shall be prorated to the value of each section.

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

PROJECT DESCRIPTION: GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

C2.1 Pricing Instructions

A. DAY WORK SCHEDULE

This Day work Schedule shall be used for the valuation of any additional or substituted work which cannot conveniently be valued at the rates and prices submitted in the schedule of quantities.

In respect of labour and materials used in the additional or substituted work not covered in the Day work Schedule the Contractor shall be paid the actual cost plus the percentage allowance stated in the schedule of quantities.

The Tenderer shall quote hereunder rates which shall apply for payment purposes if the Employer's Agent orders additional or substituted work to be carried out on a day work basis and shall therefore be in accordance with the requirements of clause 37(2) of the General Conditions of Contract.

B. LABOUR AND MATERIALS

Rates and prices entered in the schedule shall be held to allow for net cost of labour and materials delivered to site respectively with the percentage allowances stated in the schedule of quantities.

C. PLANT AND EQUIPMENT

All plant provided by the Contractor for the execution and maintenance of the works shall be of a character comparable with the scope of the works.

The Contractor shall provide and maintain sufficient plant to meet all Contract ual requirements and shall not remove any of this plant from the site without the written permission of the Engineer. He shall, however, remove unsuitable, obsolete or worn-out plant from the site when ordered to do so by the Engineer and replace these with plant approved by the Engineer.

The approval of any plant on the site by the Engineer shall in no way relieve the Contractor of any of his obligations under the Contract.

The rates for plant items not listed in the schedule will be the ruling plant hire rates, inclusive of fuels and lubricants but exclusive of labour charges for the operators, inclusive of a 7,5% handling charge. It is therefore in the Tenderers interest to ensure that the list is complete.

Should there be insufficient space on the pages provided; the Tenderer shall add further pages as required.

THE RATES FOR THE PLANT AND EQUIPMENT MENTIONED IN THE SCHEDULE SHALL BE FILLED IN FOR THE ITEMS REQUESTED. SHOULD AN ITEM BE OMITTED IT SHALL BE DEEMED TO HAVE BEEN INCLUDED IN THE OTHER DAYWORKS RATES.

B. LABOUR

DESIGNATION		RATE	
		R	C
Foreman/ Section leader	per hour		
Surveyor	per hour		
Surveyor's assistant	per hour		
Truck driver	per hour		
Labour - unskilled	per hour		
- semi-skilled	per hour		
- skilled	per hour		

C. PLANT AND EQUIPMENT

ITEM	DESCRIPTION	NON-WORKING RATE*		OPERATING RATE		PER
		R	c	R	C	UNIT
	Excavator (20 Ton minimum)					
	LDV (1 Ton or equivalent)					
	Tipper 10 cubic meter					
	Grader (140G or equivalent)					
	Roller (Walk behind)					
	Water Tanker (Litres specified)					
	TLB					
	Crane/ Crane Truck (10 Ton or equivalent)					

*Only applicable on authority of the Employer's Agent.

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

PROJECT DESCRIPTION: GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

C2.2 Bill of Quantities

GROBLERSDAL LUCKAU BWS PHASE 1 - CONTRACT C
CONTRACT No:
SECTION 1: PRELIMINARY AND GENERAL

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1	SABS 1200 A	**PRELIMINARY AND GENERAL**				
1.1		**FIXED-CHARGE ITEMS**				
1.1.1	8.3.1	Contractural Requirements	Sum	1		
1.1.2	8.3.2	Establishment facilities on site				
1.1.2.1	8.3.2.1	Facilities for the Engineer				
		(a) Furnished offices not Less than 18m². Office to include HP plotter, A4 printer, wifi connection, kitchen & aircon	Prov.Sum	1	100 000,00	R100 000,00
		(b) Telephone	Prov.Sum	1	30 000,00	R30 000,00
		(c) Nameboards	No	1		
		(e) Survey Equipment	Prov.Sum	1	20 000,00	R20 000,00
1.1.3	8.3.2.2	Facilities for the contractor				
		(a) Workshops and Storage Sheds	Sum	1		
		(b) Workshops	Sum	1		
		(c) Laboratories	Sum	1		
		(d) Living accommodation	Sum	1		
		(e) Ablution and latrine facilities	Sum	1		
		(f) Tools and equipment	Sum	1		
		(g) Water supplies, electric power and communications	Sum	1		
		(h) Dealing with water	Sum	1		
		(i) Dealing with traffic	Sum	1		
		(j) Access	Sum	1		
1.1.4	8.3.3	Other fixed-charge obligations (including protection of all property entered upon)	Sum	1		
1.1.5	8.3.4	Removal of Contractor's and Engineer's site establishment on completion	Sum	1		
	1200 A	TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		Brought Forward				
1.1.6	**PSA 4.4 8,10**	Occupational Health and Safety				
		(b) Preparation of Health and Safety Plan	Sum	1		
		(d) Health and Safety Training	Sum	1		
		(c) Personal Protective Clothing and Equipment	Sum	1		
		(d) Fences, Signs and Barricades	Sum	1		
		(e) Establishment of Safety Administration	Sum	1		
1.2		**TIME-RELATED ITEMS**				
1.2.1	8.4.1	Contractural requirements	Sum	1		
1.2.2	8.4.2	Operation and maintenance of facilities on the site for the duration of construction period except otherwise where stated				
1.2.2.1	8.4.2.1	Facilities for the Engineer				
		(a) Furnished offices	Sum	1		
		(b) Telephone	Prov.Sum	1	36 000,00	R36 000,00
		(c) Survey Assistant	Prov.Sum	1	60 000,00	R60 000,00
		(d) Internet Connection	Prov.Sum	1	20 000,00	R20 000,00
		(e) Living accommodation	Prov.Sum	1	192 000,00	R192 000,00
1.2.2.2	8.4.3	Facilities for the Contractor				
		(a) Offices and storage sheds	Sum	1		
		(b) Workshops	Sum	1		
		(c) Laboratories	Sum	1		
		(d) Living accommodation	Sum	1		
	1200 A	TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		Brought Forward				
		(e) Ablution and latrine facilities	Sum	1		
		(f) Tools and equipment	Sum	1		
		(g) Water supplies, electric power and sewer	Sum	1		
		(h) Dealing with water	Sum	1		
		(i) Access	Sum	1		
1.2.3		Time related obligations				
		a) Construction supervision	Months	12		
1.3	PSA8-4 8.5	**Sums stated provisionally by the engineer:**				
		(a) Monthly payment of salary for the Community Liason Officer	Prov Sum	1	120 000,00	R120 000,00
		(b) Engineer's administration to the Contractor & monitoring of OHS requirements on the project	Prov Sum	1	300 000,00	R300 000,00
		(c) Training of local labour				
		i) Generic skills	Prov.Sum	1	240 000,00	R240 000,00
		ii) Entreprenaural skills	Prov.Sum	1	240 000,00	R240 000,00
		iii) Monthly payment of salary for Students in training	Prov Sum	1	120 000,00	R120 000,00
		iv) Payment of labourers whilst under training	Prov Sum	1	162 240,00	R162 240,00
		(d) Overheads, charges and profit on item 1.3 (a), (b) and (c) above	%	1 182 240		
		(e) Monthly payment of PSC Members Seating for meetings. R200/person/seating for a maximum of 10 People for 12 months	Prov Sum	1	24 000,00	R24 000,00
		(f) Overheads, changes on item (e) above	%	24 000		
		(g) Accomodation for Engineer's Representative	Prov Sum	1	96 000,00	R96 000,00
	1200 A	TOTAL CARRIED FORWARD				

GROBLERSDAL LUCKAU BWS PHASE 1 - CONTRACT C
CONTRACT No:
SECTION 1: PRELIMINARY AND GENERAL

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		Brought Forward				
	PS 10.1(ii)	(h) Management and Superintendance of community based Contractors	Prov.Sum	1	100 000,00	R100 000,00
		(i) Overheads, charges and profit on item 1.3 (h) above	%	100 000		
		(j) Social Facilitation	Prov.Sum	1	420 000,00	R420 000,00
		(k) Pipeline: Independent inspectorate for testing of field welds and joint repairs	Prov.Sum	1	R 250 000	R250 000,00
		(l) Percentage adjustment on the item above for Contractor's overheads and profit (State % and extend as an amount)	%	250 000		
		(m) Pipeline: Independent inspectorate for testing of pipes, linings and coatings at factory	Prov.Sum	1	250 000,00	R250 000,00
		(n) Percentage adjustment on the item above for Contractor's overheads and profit (State % and extend as an amount)	%	250 000		
		(m) Independent inspectorate for testing and inspection of cathodic protection systems	Prov.Sum	1	500 000,00	R500 000,00
		(n) Percentage adjustment on the item above for Contractor's overheads and profit (State % and extend as an amount)	%	500 000		
1.4	PSA8-5 8.6	Prime cost sums:				
		(a) Additional tests required by the Engineer	PC Sum	1	1 000 000,00	R1 000 000,00
		(b) Charge required by Contractor on sub item 1.4 (a) above	%	1 000 000		
		(c) Locating and protecting existing services such as electricity, water, telecomunications	PC Sum	1	250 000,00	R250 000,00
1.5		**Permits and wayleave** Application for all required wayleaves and permit. Including seeking wayleave &permit renewal where necessary:	Sum			
1.5		**Stalls/Vendors** Removal and re-installation of vendors from site at the R33 and R574 junction	Sum			
	1200 A	**TOTAL CARRIED OVER TO SUMMARY**				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
2,1	SABS 1200C	**SECTION C: SITE CLEARANCE**				
2.1.1	8.2.1	Clear and grub:				
		(a) Strips for water pipeline of 2m wide	m	3260		
2.1.2	8.2.2	Remove and grub large trees and tree stumps of girth:				
		(a) Over 1,0 m and up to and including 2,0 m	No	20		
2.1.3	8.2.5	Take down and reinstate existing fences	km	2,5		
2.1.4	8.2.6	Clear hedge or fence or both where not scheduled separately	m	1000		
2,2		**SECTION DB : TRENCH EXCAVATION**				
2.2.1	**SABS 1200 DB**	**Excavation**				
2.2.1.1	8.3.2	Excavate in all materials for trenches, backfill, compact and dispose of surplus material for watermains of:				
		(a) Pipes up to 500 mm dia for depths:				
		Over and Up to				
		(i) 0,0 m 1,0 m	m^3	489		
		(ii) 1,0 m 2,0 m	m^3	5543		
		(b) extra over item (a) above for				
		(i) Intermediate excavation	m^3	1109		
		(ii) Hard rock excavation	m^3	1810		
2.2.2	8.3.3	**Excavation ancillaries**				
2.2.2.1	8.3.3.1	Make up deficiency in backfill material:				
		(a) From other necessary excavations on Site	m^3	277		
		(b) By importation from designated borrow pits	m^3	388		
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
		(c) By importation from commercial or off-site sources selected by Contractor	m^3	277		
		(d) Opening up and closing down of designated borrow pits	Sum	1		
2,3	**1200 DB** 8.3.8.1	**Location of existing services:**				
2.3.1		Supply of specialist equipment for the detection of existing services	Prov Sum	1	250 000,00	250 000,00
2.3.2		Excavate by hand in soft material to expose existing services	m^3	41		
1.2						
2.3.3		Protect existing services	Prov Sum	1	20 000,00	20 000,00
2.4.1	8.3.6.1	Reinstate road surfaces complete with all courses:				
		(a) Gravel on shoulders	m^2	408		
		(b) Gravel on roads	m^2	82		
		(c) Asphalt of thickness of up to 30mm in roadway	m^2	41		
2,5	**SABS 1200 LB**	**SECTION LB: BEDING (PIPES)**				
2.5.1	8.2.1	Provision of bedding from trench excavation within 0.5km:				
		(a) Selected granular material	m^3	98		
		(b) Selected fill material	m^3	395		
2.5.2	8.2.2	Supply only of bedding by importation:				
2.5.3	8.2.2.1	(a) From other necessary excavations within 0,5 km: (Provisional)				
		(i) Selected granular material	m^3	65		
		(ii) Selected fill material	m^3	263		
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
	8.2.2.2	(b) From borrow pits within 0,5 km: (Provisional)				
		(i) Selected granular material	m^3	130		
		(ii) Selected fill material	m^3	526		
	8.2.2.2	(c) From commercial sources within 0,5 km: (Provisional)				
		(i) Selected granular material	m^3	33		
		(ii) Selected fill material	m^3	122		
				12		
2.5.4	8.2.4	Encasing of pipes in concrete (Grade 25 Mpa)	m^3	20		
1.3						
2.5.5	8.2.5	Overhaul of Bedding and Selected fill Blanket	m^3km	183		
2,6	**SABS 1200L**	**SECTION L: PIPEWORK**				
2.6.1		**Labour intensive excavation**				
2.6.1.1	PG4	Excavation by labour intensive methods in all materials for trenches, backfill, compact and dispose of surplus material for:				
		a) Pipes up to 500 mm dia for depths:				
		Over and Up to				
		(i) 0,0 m 1,0 m	m^3	302		
		Monthly payment of salary for Students in training				
2.6.2.1		Supply, handle, lay, joint and bed, test and disinfect the following diameter steel pipe ERW, grade API 5L x 42 to SANS 719. Internal lining: 0.4mm liquid Epoxy and External coating: 2.0mm MDPE or 3LPE with Rubber Ring Joint connection (By Hall Longmore or similar approved) and pipe wall thickness t=6mm		1182240		
		a) 500mm dia steel pipe PN 40	m	3260		
2.6.3	**8.2.4**	**BENDS**				
2.6.3.1		Supply, handle, lay, joint, bed, test, disinfect and join to the system steel pipe Grade B with epoxy coating for corrossion				
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
		protection (6mm thickness) including all flanges gaskets, bolts & nuts. All to be Class 40, flanged to SANS 1123 for 500mm dia steel pipes.				
		Overheads, charges and profit on item 1.3 (h) above				
		i) 11.5°	No	18		
		ii) 22.5°	No	9		
		iii) 45°	No	4		
		iv) 90°	No	4		
2.6.4	**PSL 4.2**	**FABRICATION, SUPPLY, TRANSPORT AND INSTALL VJ COUPLING**				
		a) For 500mm pipe	No	11		
2.6.5	**PSL 4.2**	**FABRICATION, SUPPLY, TRANSPORT AND INSTALL FLANGED ADAPTERS**				
		a) Rubber Ring x Flanged adapters at bends and valve chambers Class (PN 25)	No	94		
2.6.6	**8.2.5 & 8.2.13**	**SCOUR VALVES**				
2.6.6.1		Supply, install Class 40 Scour Valve Type as shown DWG No. 17005/04/09 including all fittings on the following pipes:				
		a) 350 mm NB	No	2		
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
2.6.7	**8.2.5 & 8.2.13**	**AIR VALVES**				
2.6.7.1		Supply, install Class 40 Air Valve Vent-O-Mat Type as shown on DWG No.17005/04/10 including all fittings for the following diameters:				
		a) 100 mm NB	No	7		
		b) 150 mm NB	No	1		
		c) 200 mm NB	No	1		
2.7	**SABS**	**FLOW METER**				
	1200LF 8.2.4	Supply and install Class B Horizontal Woltman meter or similar approved complete with fittings and directional meters to SABS 1529 complete with couplings and chamber according to DWG 17005/04/11				
		a) 350mm	No	1		
2,8		**Valve Chambers**				
2.8.1		Rate to include all concreting, formwork, excavation, brickwork, step ledder, 19mm cruser stones, steel manhole cover, and steel reinforcement for:				
		(a) Air Valves (see DWG 17005/04/10)	No	9		
		(b) Scour Valves (see DWG 17005/04/09)	No	2		
2.9		**Road and Stream Crossings**				
2.9.1		Road Crossings Crossings				
		a) Municipal & Provincial tarred roads	No	2		
2.9.2		Stream and River Crossings				
		(a) Small rivers & Streams	No	1		
		(b) Large rivers	No			
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
2.10		**Cathodic Protection (CP) and AC Interference Mitigation (ACIM). This work was done by a specialist professional services provider and a selected specialist contractor & therefore becomes nominated sub-contractors to this contract**				
		a) Nominated specialist CP Contractor. As specialist appointed by main contractor as sub-contractor				
		i) Section 100:General	Prov Sum	1	837 681,30	837 681,30
		ii) Section 200: Sacrificial CP	Prov Sum	1	589 585,10	589 585,10
		iii) Section 400: AC Mitigation	Prov Sum	1	668 417,20	668 417,20
		iv) Section 600: Pipe DC & AC Coupons	Prov Sum	1	593 970,00	593 970,00
		v) Section 700: Continuity & Cross Bond	Prov Sum	1	593 585,60	593 585,60
		vi) Section 800: Pipe Monitor & Local CP	Prov Sum	1	586 294,90	586 294,90
		vii) Section Additional Items as Listed	Prov Sum	1	694 466,20	694 466,20
2.11		**Marking of Valve Chambers** Mark Calve chambers to denote the contents as per project specification	No.	14		
2.12		**Hydrostatic Testing and Drainage** Drain and Test new pipeline complete as per project specification	Sum	1		
2.13		**Sterilization of pipelines** Sterilize the new pipline complete as per project specification	Sum	1		
2.14	**8.2.8**	**PIPELINE MARKERS "LI"**				
2.14.1		Manufacture, supply, handle, install and paint marker posts inclusive the cost of listing and submitting a record of the installations to the Engineer according to DWG No. 17005/04/13	No	7		
3.15		Removal and reinstallation of stalls located within both SANRAL and RAL road reserves	Sum	1		
		TOTAL CARRIED OVER TO SUMMARY				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3.1	SABS 1200C	**SECTION C: SITE CLEARANCE**				
3.1.1	8.2.1	Clear and grub:				
		(a) Strips for water pipeline of 2m wide	m	4238		
3.1.2	8.2.2	Remove and grub large trees and tree stumps of girth:				
		(a) Over 1,0 m and up to and including 2,0 m	No	20		
3.1.3	8.2.5	Take down and reinstate existing fences	km	2,5		
3.1.4	8.2.6	Clear hedge or fence or both where not scheduled separately	m	1000		
3.2		**SECTION DB : TRENCH EXCAVATION**				
3.2.1	**SABS 1200 DB**	**Excavation**				
3.2.1.1	8.3.2	Excavate in all materials for trenches, backfill, compact and dispose of surplus material for watermains of:				
		(a) Pipes up to 500 mm dia for depths:				
		Over and Up to				
		(i) 0,0 m 1,0 m	m^3	636		
		(ii) 1,0 m 2,0 m	m^3	6358		
		(b) extra over item (a) above for				
		(i) Intermediate excavation	m^3	1272		
		(ii) Hard rock excavation	m^3	2098		
3.2.2	8.3.3	**Excavation ancillaries**				
3.2.3.1	8.3.3.1	Make up deficiency in backfill material:				
		(a) From other necessary excavations on Site	m^3	318		
		(b) By importation from designated borrow pits	m^3	445		
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
		(c) By importation from commercial or off-site sources selected by Contractor	m^3	318		
		(d) Opening up and closing down of designated borrow pits	Sum	1		
3.3	**1200 DB** 8.3.8.1	**Location of existing services:**				
3.3.1		Supply of specialist equipment for the detection of existing services	Prov Sum	1	175 000,00	175 000,00
3.3.2		Excavate by hand in soft material to expose existing services	m^3	53		
1.2 3.3.3		Protect existing services	Prov Sum	1	20 000,00	20 000,00
3.4.1	8.3.6.1	Reinstate road surfaces complete with all courses:				
		(a) Gravel on shoulders	m^2	530		
		(b) Gravel on roads	m^2	106		
		(c) Asphalt of thickness of up to 30mm in roadway	m^2	53		
3.5	**SABS 1200 LB**	**SECTION LB: BEDING (PIPES)**				
3.5.1	8.2.1	Provision of bedding from trench excavation within 0.5km:				
		(a) Selected granular material	m^3	127		
		(b) Selected fill material	m^3	513		
3.5.2	8.2.2	Supply only of bedding by importation:				
3.5.3	8.2.2.1	(a) From other necessary excavations within 0,5 km: (Provisional)				
		(i) Selected granular material	m^3	85		
		(ii) Selected fill material	m^3	342		
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
	8.2.2.2	(b) From borrow pits within 0,5 km: (Provisional)				
		(i) Selected granular material	m^3	170		
		(ii) Selected fill material	m^3	684		
	8.2.2.2	(c) From commercial sources within 0,5 km: (Provisional)				
		(i) Selected granular material	m^3	42		
		(ii) Selected fill material	m^3	159		
				12		
3.5.4	8.2.4	Encasing of pipes in concrete (Grade 25 Mpa)	m^3	20		
1.3						
3.5.5	8.2.5	Overhaul of Bedding and Selected fill Blanket	m^3km	238		
3.6	**SABS 1200L**	**SECTION L: PIPEWORK**				
3.6.1		**Labour intensive excavation**				
3.6.1.1	PG4	Excavation by labour intensive methods in all materials for trenches, backfill, compact and dispose of surplus material for:				
		a) Pipes up to 300 mm dia for depths:				
		Over and Up to				
		(i) 0,0 m 1,0 m	m^3	210		
		Monthly payment of salary for Students in training				
3.6.3.1		Supply, handle, lay, joint and bed, test and disinfect the following diameter steel pipe ERW, grade API 5L x 42 to SANS 719. Internal lining: 0.4mm liquid Epoxy and External coating: 2.0mm MDPE or 3LPE with Rubber Ring Joint connection (By Hall Longmore or similar approved) and pipe wall thickness t=6mm		1182240		
		a) 300mm dia steel pipe PN 25	m	4238		
3.6.3	**8.2.4**	**BENDS**				
3.6.3.1		Supply, handle, lay, joint, bed, test, disinfect and join to the system steel pipe Grade B with epoxy coating for corrossion				
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
		protection (6mm thickness) including all flanges gaskets, bolts & nuts. All to be Class 25, flanged to SANS 1123 for 300mm dia steel pipes.				
		Overheads, charges and profit on item 1.3 (h) above				
		i) 11.5°	No	28		
		ii) 22.5°	No	16		
		iii) 45°	No	4		
		iv) 90°	No	4		
3.6.4	**PSL 4.2**	**FABRICATION, SUPPLY, TRANSPORT AND INSTALL VJ COUPLING**				
		a) For 300mm pipe	No	6		
3.6.5	**PSL 4.2**	**FABRICATION, SUPPLY, TRANSPORT AND INSTALL FLANGED ADAPTERS**				
		a) Flanged x Rubber Ring adapters at valve chambers	No	118		
3.6.6	**8.2.5 & 8.2.13**	**SCOUR VALVES**				
3.6.6.1		Supply, install Class 25 Scour Valve Type as shown DWG No. 17005/04/09 including all fittings on the following pipes:				
1.4		a) 300 mm NB	No	3		
3.6.7	**8.2.5 & 8.2.13**	**AIR VALVES**				
3.6.7.1		Supply, install Class 40 Air Valve Vent-O-Mat Type as shown on DWG No.17005/04/10 including all fittings for the following diameters:				
		a) 80 mm NB	No	8		
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
		b) 100 mm NB	No	3		
		c) 150 mm NB	No			Rate Only
3.7	**SABS**	**FLOW METER**				
	1200LF 8.2.4	Supply and install Class B Horizontal Woltman meter or similar approved complete with fittings and directional meters to SABS 1529 complete with couplings and chamber according to DWG 17005/04/11				
		a) 200mm	No	1		
3.8		**Valve Chambers**				
3.8.1		Rate to include all concreting, formwork, excavation, brickwork, step ledder, 19mm cruser stones, steel manhole cover, and steel reinforcement for:				
		(a) Air Valves (see DWG 17005/04/10)	No	3		
		(b) Scour Valves (see DWG 17005/04/09)	No	3		
3.9		**Road and Stream Crossings**				
3.9.1		Stream and River Crossings				
		(a) Small rivers & Streams	No	1		
		(b) Large rivers	No			Rate Only
3.10		**Cathodic Protection (CP) and AC Interference Mitigation (ACIM). This work was done by a specialist professional services provider and a selected specialist contractor & therefore becomes nominated sub-contractors to this contract**				
		a) Nominated specialist CP Contractor. As specialist appointed by main contractor as sub-contractor				
		i) Section 100:General	Prov Sum	1	641 723,70	641 723,70
		ii) Section 200: Sacrificial CP	Prov Sum	1	451 664,30	451 664,30
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
		iii) Section 400: AC Mitigation	Prov Sum	1	512 055,30	512 055,30
		iv) Section 600: Pipe DC & AC Coupons	Prov Sum	1	455 023,50	455 023,50
		v) Section 700: Continuity & Cross Bond	Prov Sum	1	454 728,90	454 728,90
		vi) Section 800: Pipe Monitor & Local CP	Prov Sum	1	449 143,80	449 143,80
		vii) Section Additional Items as Listed	Prov Sum	1	532 010,80	532 010,80
3.11		**Marking of Valve Chambers** Mark Calve chambers to denote the contents as per project specification	No.	9		
3.12		**Hydrostatic Testing and Drainage** Drain and Test new pipeline complete as per project specification	Sum	1		
3.13		**Sterilization of pipelines** Sterilize the new pipline complete as per project specification	Sum	1		
3.14	**8.2.8**	**PIPELINE MARKERS "LI"**				
3.14.1		Manufacture, supply, handle, install and paint marker posts inclusive the cost of listing and submitting a record of the installations to the Engineer according to DWG No. 17005/04/13	No	8		
3.15		Removal and reinstallation of stalls located within both SANRAL and RAL road reserves	Sum	1		
		TOTAL CARRIED OVER TO SUMMARY				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4.1	SABS 1200C	**SECTION C: SITE CLEARANCE**				
4.1.1	8.2.1	Clear and grub:				
		(a) Strips for water pipeline of 2m wide	m	976		
4.1.2	8.2.2	Remove and grub large trees and tree stumps of girth:				
		(a) Over 1,0 m and up to and including 2,0 m	No	5		
4.1.3	8.2.5	Take down and reinstate existing fences	km	0,5		
4.1.4	8.2.6	Clear hedge or fence or both where not scheduled separately	m	1000		
4.2		**SECTION DB : TRENCH EXCAVATION**				
4.2.1	**SABS 1200 DB**	**Excavation**				
4.2.1.1	8.3.2	Excavate in all materials for trenches, backfill, compact and dispose of surplus material for watermains of:				
		(a) Pipes up to 500 mm dia for depths:				
		Over and Up to				
		(i) 0,0 m 1,0 m	m^3	96		
		(ii) 1,0 m 2,0 m	m^3	952		
		(b) extra over item (a) above for				
		(i) Intermediate excavation	m^3	190		
		(ii) Hard rock excavation	m^3	524		
4.2.2	8.3.3	**Excavation ancillaries**				
4.2.4.1	8.3.3.1	Make up deficiency in backfill material:				
		(a) From other necessary excavations on Site	m^3	48		
		(b) By importation from designated borrow pits	m^3	67		
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
		(c) By importation from commercial or off-site sources selected by Contractor	m^3	48		
		(d) Opening up and closing down of designated borrow pits	Sum	1		
4.3	**1200 DB** 8.3.8.1	**Location of existing services:**				
4.4.1		Supply of specialist equipment for the detection of existing services	Prov Sum	1	25 000,00	25 000,00
4.4.2		Excavate by hand in soft material to expose existing services	m^3	12		
1.2						
4.4.3		Protect existing services	Prov Sum	1	20 000,00	20 000,00
4.4.1	8.3.6.1	Reinstate road surfaces complete with all courses:				
		(a) Gravel on shoulders	m^2	122		
		(b) Gravel on roads	m^2	24		
		(c) Asphalt of thickness of up to 30mm in roadway	m^2	12		
4.5	**SABS 1200 LB**	**SECTION LB: BEDING (PIPES)**				
4.5.1	8.2.1	Provision of bedding from trench excavation within 0.5km:				
		(a) Selected granular material	m^3	19		
		(b) Selected fill material	m^3	77		
4.5.2	8.2.2	Supply only of bedding by importation:				
4.5.3	8.2.2.1	(a) From other necessary excavations within 0,5 km: (Provisional)				
		(i) Selected granular material	m^3	13		
		(ii) Selected fill material	m^3	51		
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
	8.2.2.2	(b) From borrow pits within 0,5 km: (Provisional)				
		(i) Selected granular material	m^3	25		
		(ii) Selected fill material	m^3	102		
	8.2.2.2	(c) From commercial sources within 0,5 km: (Provisional)				
		(i) Selected granular material	m^3	6		
		(ii) Selected fill material	m^3	24 12		
4.5.4	8.2.4	Encasing of pipes in concrete (Grade 25 Mpa)	m^3	20		
1.3						
4.5.5	8.2.5	Overhaul of Bedding and Selected fill Blanket	m^3km	36		
4.6	**SABS 1200L**	**SECTION L: PIPEWORK**				
4.6.1		**Labour intensive excavation**				
4.6.1.1	PG4	Excavation by labour intensive methods in all materials for trenches, backfill, compact and dispose of surplus material for:				
		a) Pipes up to 300 mm dia for depths:				
		Over and Up to				
		(i) 0,0 m 1,0 m Monthly payment of salary for Students in training	m^3	31		
4.6.4.1		Supply, handle, lay, joint and bed, test and disinfect the following diameter steel pipe ERW, grade API 5L x 42 to SANS 719. Internal lining: 0.4mm liquid Epoxy and External coating: 2.0mm MDPE or 3LPE with Rubber Ring Joint connection (By Hall Longmore or similar approved) and pipe wall thickness t=6mm		1182240		
		a) 300mm dia steel pipe PN 25	m	976		
4.6.3	**8.2.4**	**BENDS**				
4.6.4.1		Supply, handle, lay, joint, bed, test, disinfect and join to the system steel pipe Grade B with epoxy coating for corrossion				
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
		protection (6mm thickness) including all flanges gaskets, bolts & nuts. All to be Class 25, flanged to SANS 1123 for 300mm dia steel pipes.				
		Overheads, charges and profit on item 1.3 (h) above				
		i) 11.5°	No	9		
		ii) 22.5°	No	6		
		iii) 45°	No	4		
		iv) 90°	No	3		
4.6.4	**PSL 4.2**	**FABRICATION, SUPPLY, TRANSPORT AND INSTALL VJ COUPLING**				
		a) For 300mm pipe	No	3		
4.6.5	**PSL 4.2**	**FABRICATION, SUPPLY, TRANSPORT AND INSTALL FLANGED ADAPTERS**				
		a) Flanged x Rubber Ring adapters at valve chambers	No	52		
4.6.6	**8.2.5 & 8.2.13**	**AIR VALVES**				
4.6.6.1		Supply, install Class 40 Air Valve Vent-O-Mat Type as shown on DWG No.17005/04/10 including all fittings for the following diameters:				
		a) 80 mm NB	No	1		
		b) 100 mm NB	No	2		
		c) 150 mm NB	No			Rate Only
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
4.7	**SABS**	**FLOW METER**				
	1200LF 8.2.4	Supply and install Class B Horizontal Woltman meter or similar approved complete with fittings and directional meters to SABS 1529 complete with couplings and chamber according to DWG 17005/04/11				
		a) 200mm	No	1		
4.8		**Valve Chambers**				
4.8.1		Rate to include all concreting, formwork, excavation, brickwork, step ledder, 19mm cruser stones, steel manhole cover, and steel reinforcement for:				
		(a) Air Valves (see DWG 17005/04/10)	No	3		
4,9		**Road and Stream Crossings**				
4.9.1		Road Crossings Crossings				
		a) Streets	Sum	1		
		TOTAL CARRIED FORWARD				

ITEM NO	PAYMENT REFERS TO	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
4,10		**Cathodic Protection (CP) and AC Interference Mitigation (ACIM). This work was done by a specialist professional services provider and a selected specialist contractor & therefore becomes nominated sub-contractors to this contract**				
		a) Nominated specialist CP Contractor. As specialist appointed by main contractor as sub-contractor				
		i) Section 100:General	Prov Sum	1	88 672,40	88 672,40
		ii) Section 200: Sacrificial CP	Prov Sum	1	62 410,30	62 410,30
		iii) Section 400: AC Mitigation	Prov Sum	1	70 755,00	70 755,00
		iv) Section 600: Pipe DC & AC Coupons	Prov Sum	1	62 874,50	62 874,50
		v) Section 700: Continuity & Cross Bond	Prov Sum	1	62 833,80	62 833,80
		vi) Section 800: Pipe Monitor & Local CP	Prov Sum	1	62 062,00	62 062,00
		vii) Section Additional Items as Listed	Prov Sum	1	73 512,40	73 512,40
4.11		**Marking of Valve Chambers** Mark Calve chambers to denote the contents as per project specification	No.	4		
4.12		**Hydrostatic Testing and Drainage** Drain and Test new pipeline complete as per project specification	Sum	1		
4.13		**Sterilization of pipelines** Sterilize the new pipline complete as per project specification	Sum	1		
4.14	8.2.8	**PIPELINE MARKERS "LI"**				
4.14.1		Manufacture, supply, handle, install and paint marker posts inclusive the cost of listing and submitting a record of the installations to the Engineer according to DWG No. 17005/04/13	No	2		
		TOTAL CARRIED OVER TO SUMMARY				

GROBLERSDAL LUCKAU BWS PHASE 1 - CONTRACT C
CONTRACT NO.:
SUMMARY OF BILLS

SECTION	DESCRIPTION	AMOUNT
SECTION 1	PRELIMINARIES AND GENERALS	
SECTION 2	WTW TO R574 JUNCTION	
SECTION 3	WTW TO BLOED RIVER CROSSING	
SECTION 4	R574 TO MOTETEMA SERVICE RESERVOIR	
	SUB-TOTAL	
	ADD CONTIGENCIES @ 10%	
	SUB-TOTAL INCLUDING CONTIGENCIES	
	ADD VAT @15%	
	TOTAL SUM	

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PART C3 Scope of Work

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C3: SCOPE OF WORK

As much as is economically feasible all work shall be implemented by employing Labour Intensive Construction methods. Over and above the normal Building and Allied works to be implemented by employing skilled and unskilled labour the works specified in the “Guidelines for the Implementation of Labour-Intensive Infrastructure Projects under the Expanded Public Works Programme (EPWP)” shall be undertaken using Labour Intensive Construction methods

C3.1 DESCRIPTION OF THE WORKS

1.1 Employer's objectives

The employer's objectives are to deliver public infrastructure using labour intensive methods and sub-Contractors where possible. The works in this Contract are to be executed by using both conventional construction and labour –intensive construction methods according to the special public works programme (SPWP) as prescribed in the guidelines of the Expanded public works program (EPWP).

The following prerequisites will apply for the appointment of sub-Contractor:

- Sub-Contractor will preferably be from the community where the works are executed
- Otherwise, sub-Contractors will be from the Sekhukhune District Municipality Regions in the proximity of the community where the works are executed.
- Prior to site establishment, the successful Bidder will submit details of the sub-Contractors to be used in the execution of the Works.

1.1.1 Labour intensive works

Labour intensive construction methods shall be implemented using unemployed local works who are temporarily employed in terms of the project specification. The main Contractor must provide NAF2 level training to the Sub-Contractors.

1.1.2 Labour-intensive competencies of supervisory and management staff

Contractors shall engage supervisory and management staff in labour-intensive works that have completed the skills programme including Foremen/Supervisors at NQF "National Certificate: Supervision of Civil Engineering Construction Processes" and Site Agent/Manager at NQF level 5 "Manage labour-intensive Construction Processes" or equivalent QCTO qualifications.

1.2 Overview of the works

The Works comprise the construction of approximately 3.2km and 5.2km of 500mm and 300mm diameter steel pipelines respectively, inclusive of air release valves, scour valves and in-line isolating valves located in appropriate chambers along the route of the pipeline, placed in such manner as to ensure optimal operation and maintenance of the pipeline once commissioned.

The 500mm pipeline will comprise sections of Steel material. The total length (5.2km), PN40 steel 6mm wall grade X42 steel plate complete with coating and lining. Ends must be manufactured or procured and supplied by the contractor. All other items such as valves, pipe specials such as bends, tees, reducers, etc) as well as any pipes of different diameters, or equal diameters but different grade of steel or wall must also be procured by the Contractor.

The 300mm pipeline will comprise steel material over the total length. The total length (4.2km), PN40 steel 6mm wall grade X42 steel plate complete with coating and lining. Ends must be manufactured or procured and supplied by the contractor. All other items such as valves, pipe specials such as bends, tees, reducers, etc) as well as any pipes of different diameters, or equal diameters but different grade of steel or wall must also be procured by the Contractor.

Included in the project are the Cathodic Protection of the pipeline and appurtenant works.

The work will be carried using Labour- Intensive approach as much as possible. Labour-intensive

works comprise the activities described in SANS 1921-5, Earthworks activities which are to be performed by hand, and its associated specification data. Such works shall be Constructed using local workers who are temporarily employed in terms of this Scope of Work.

1.3 Extent of the works

The construction of **GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C** includes the following:

(a) Pipeline:

- Establishment of Contractor's camp site;
- Location and protection of existing services;
- Clearing of the entire pipeline servitudes as well as grubbing of such areas of the servitudes where the pipe trench is to be excavated;
- Stripping of topsoil over the trench excavation and temporary stockpiling;
- All trench excavations in accordance with the longitudinal sections to ensure that the pipeline is constructed to the gradients and levels as indicated on the longitudinal sections;
- Excavation of trenches in all materials to depths varying between 1,7m and 2,5m;
- Preparation of the pipe bedding
- Laying of approximately 3.2km of 500mm diameter PN40 6mm wall grade X42 steel complete with coating and lining ends including testing and disinfecting of pipes,
- Laying of approximately 4.2km of 300mm diameter PN40 6mm wall grade X42 steel complete with coating and lining ends including testing and disinfecting of pipes,
- Laying of approximately 1km of 300mm diameter PN40 6mm wall grade X42 steel complete with coating and lining ends including testing and disinfecting of pipes,
- coating and lining ends prepared for butt welding including testing and disinfecting of pipes,
- Excavate and backfill at road crossings by means of the open trench method;
- Excavate, protect and backfill minor stream crossings;
- Installation of air valves, scour valves and in-line isolating valves;
- Installation of water meters with isolating valves at all pump stations;
- Construction reinforced concrete and brick valve chambers of varying dimensions;
- Connecting to existing pipework in accordance with the details on the drawings;
- Installation of a temporary connection at the end of the pipeline;
- Construction of pig launcher and receiver stations;
- Construction of the River Crossing
- Cathodic protection of the system;

1.4 Location of the works

The limits of the project are as shown on the locality plan bound into the book of drawings to be received together with this document. The site of works is located in Groblersdal;

Table 1: GPS Locations

No.	Settlement	Latitude	Longitude
1	Groblersdal	25° 10'3.19"S	29°23'54.50"E

The site shall not only include the works area for the construction of the new services, but shall be extended in the broader sense to take account of all areas occupied by the Contractor, be it deliberate or unintentional, in the execution of the Contract.

2. Temporary Works

The Contractor shall, as relevant,

a. Temporary water connections, Contractor's offices, storage sheds, latrines, barricading of Works shall be located in an approved position and subject to the approval of all authorities concerned.

b. Construct and maintain haulage, temporary access and construction roads, subject to the approval of the Employer, and permit the Employer, other Contractors, statutory bodies or any other person who might require legitimate access to or through the site for the purpose of executing legitimate business, free and unhindered usage of such roads.

c. Safety and Security of the Contractors' temporary works shall be at the Contractors' discretion.

d. The camp shall be adequately guarded during or outside working hours.

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C3.2 ENGINEERING

C3.2 ENGINEERING

C3.2.1 STANDARDS AND CODES OF PRACTICE

The following design standards for civil engineering infrastructure will apply:

I. Guideline for Human Settlement planning and design (2000) compiled under the patronage of the Department of Housing and published by the CSIR Building and Construction Technology (New Red Book).
II. General Condition of Contract for construction works (2015) (Third Edition) by the South African Institution of Civil Engineers.
III. Technical Guidelines (2004) by the Department of water and Sanitation.
IV. SANS 1200 Standardized specifications.
V. The machinery and occupational safety act (act no 6 of 1983) as amended
VI. occupational health and safety act and regulations (act 85 of 1993) as ammended
VII. Occupational health and safety act (85/1993): construction regulations, 2014 as amended

C3.2.2 DESIGN AND SPECIFICATIONS

The standard specifications on which this Contract is based are:

SANS 1200 A	: General
SANS 1200 AB	: Engineers Office
SANS 1200 C	: Site Clearance
SANS 1200 D	: Earthworks
SANS 1200 DB	: Earthworks (Pipe works)
SANS 1200	: Medium Pressure Pipes
SANS 1200 LB	: Bedding
SANS 1200 GA	: Concrete (Small Works)
SANS 1200G	: Concrete (Structural)
SANS 1200H	: Structural Steelwork
SANS 1200HC	: Corrosion Protection
SANS 1200LC	: Cable Ducts
SANS 1200MM	: Ancillary Works

The following SANS specifications are also referred to in this document and the Contractor is advised to obtain them from Standards South Africa (a division of SANS) in Pretoria:

SANS 1921 – 1 (2004): Construction and Management Requirements for Works Contracts Part 1: *General Engineering and Construction Works*

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

Table 1:

Item No.	DESCRIPTION	DESIGN CRITERIA
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		

C3.2.3: Drawings (Read with SANS 1921 – 1: 2004 clauses 4.1.7; 4.1.11 and 4.1.12)

The reduced drawings form part of the tender documents as mentioned under Part T1 and shall be used for tendering purposes only.

The Contractor shall be supplied with three complete paper copies of the construction drawings free of charge. The Contractor shall at his own expense re-produce further paper prints required for the construction of the work.

At the completion of the Contract, the Contractor shall return to the Employer's Agent all drawings, provided or made, during the Contract period.

Any information which the Contractor has control over and which is required by the Resident Engineer to complete the as built drawings shall be made available to the Resident Engineer before the Certificate of Completion is issued.

Only written dimensions may be used. Dimensions are not to be scaled from drawings unless ordered by the Engineer. The Employer's agent will supply all figures / dimensions which are not shown on the drawings. The levels or dimensions given on the drawings are subject to confirmation on site. The Contractor shall submit all levels and dimensions to the Employer's agent for confirmation before he commences with any structural construction work. The Contractor shall also check all dimensions which are given on the drawings and inform the Employer's Agent of any conflicting dimensions.

C3.2.4: LIST OF DRAWINGS

DRAWING NO	DESCRIPTION	REFERENCE NO.:
000	DRAWING LIST	17005-00
001	NAMEBOARD DETAILS	17005-01
002	OVERALL LAYOUT	17005-02
003	WTW TO MOTETEMA RESERVOIRS AND SUMP KEY PLAN	17005-03
005	500mm WTW TO THE TEE JUNCTION OFF LONGITUDINAL SECTIONS	17005-05
006	300mm WTW TO THE TEE JUNCTION OFF LONGITUDINAL SECTIONS	17005-06
007	ROAD CROSSING DETAILS	17005-07
008	SCOUR VALVE CHAMBER DETAILS	17005-08
009	AIR VALVE CHAMBER DETAILS	17005-09
010	WATER METER CHAMBER DETAILS	17005-10
011	THRUST BLOCK DETAILS	17005-11
012	PIPE MARKER DETAILS	17005-12
013	PIPE BEDDING DETAILS	17005-13

C3.2.5 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 (if applicable) and their compatibility with the permanent Works.
(c) The Contractor shall supply all details necessary to assist the Engineer in the compilation of the record drawings.

C3.2.6 EMPLOYER'S DESIGN

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

C3.2.7 CONTRACTOR'S DESIGN

Where the Contractor is to supply the design of designated parts of the permanent Works or temporary

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C3.3 PROCUREMENT

C3.3 PROCUREMENT

C 3.3.1 PREFERENTIAL PROCUREMENT PROCEDURES

The Municipality shall adjudicate and award bids in accordance with the Supply Chain Management Regulations, Sekhukhune District Municipality Supply Chain Management Policy (on request from Municipality), and other applicable legislations

C 3.3.2 SUBCONTRACTING (COMMUNITY BASED SUBCONTRACTORS - CBS)

The commitment of the Employer to Government Policy concerning the empowerment of the CBS shall be noted and adhered to by the main Contractor.

It is the intention of The Client that the minimum targeted participation goal for the local sub-Contractors is for but not limited to the full value of sub-Contracting works identified by the Employer as covered in the Bill of Quantities. The onus is upon the main Contractor to handle and manage the procurement process of the sub-Contractors and once appointed, should be dealt with in accordance with the provisions of Clause 4.4 of the General Conditions of Contract 2015.

The identified scope of work by the Employer includes but not limited to the following:

- Installation of Pipe Markers;
- Construction of valve chambers
- Installation of Gabions at stream crossings (Where necessary)
- Any other task identified on site and approved by the Employer's Agent on site;

The minimum requirements for selection of the targeted enterprise sub-Contractors are as follows:

1. Valid CK registration;
2. Certified SA ID copies of owners;
3. Active CIDB membership: **Grading to commensurate with the value and specialization of the value and specialization of the work to be allocated:**
4. Valid Tax clearance certificate;
5. COIDA certificate;
6. Company Profile including similar experience and skilled personnel CVs;
7. Health and Safety Plan;
8. Proof of locality;
9. A qualified plumber with at least 3 years of experience;

The Contractor is:

to enter into Contract with any (nominated, selected) sub-Contractor(s) in accordance with the requirements of Clause 4.4 in the General Conditions of Contract for Civil engineering Works (2015), 3rd edition. The number of sub-Contractor(s) will be determined by the main Contractor depending on the Sub-Contracting Scope of Work and the amount of work that is to be carried out under this Contract as outlined above and in the Bill of Quantities.

a) Required to utilise local Sub-Contractors (or regional if he fails to find suitable Sub-Contractors from within the project locality)

b) Responsible for all work executed (including QUALITY, CONTRACTUAL LIABILITIES) on his behalf or under his supervision and/or management by all sub-Contractors, including nominated or selected sub-Contractors.

Note:

- Local Sub-Contractors are Sub-Contractors from within the project suburb or ward;
- Regional Sub-Contractors are Sub-Contractors from within the region as per the Sekhukhune District Municipality demarcation of the regions;
- CBS refers to Community Based Sub-Contractors;

The Contractor shall be expected to enter into a Contract with the nominated or selected Sub-Contractor(s) in accordance with the requirements of Clause 4.4 the General Conditions of Contract. The Employer must be supplied with a copy of the Contract /agreement for records.

NOTA BENE: The Employer's Agent shall not negotiate directly with sub-Contractors and all problems relating to programming, workmanship, etc., as they are matters between the Contractor and his sub-Contractors.

In the execution of the Sub-Contract Work, the Contractor shall ensure that the Sub-Contractor(s) comply with all relevant legislation and regulations including, but not confined to, the Occupational Health and Safety Act. The Contractor hereby indemnifies the Employer against any loss, damage, or claim for Sub-Contract Works set out for this specific project arising out of the former's failure to comply with instructions issued to him in regard to these requirements.

C 3.3.2.1 PERFORMANCE AND EXECUTION OF THE SUB-CONTRACT WORK

The main Contractor must ensure that his Sub-Contractors shall supply sufficient, suitable resources (e.g. equipment, labour, material) to execute all the Sub-Contract Work including the portion identified by the Employer as outlined in the Scope of Work and Bill of Quantities.

The Contractor shall also ensure that the Sub-Contractor(s) shall execute the Sub-Contract Work in accordance with the Scope of Work and Programme to the reasonable satisfaction of the Employer.

C 3.3.2.2 QUALITY OF THE SUBCONTRACT WORK

In accordance with the requirements of Clause 4.4 in the General Conditions of Contract for Civil engineering Works (2015), 3rd edition, it is the responsibility of the Contractor to ensure that the Sub-Contractor shall be capable of executing the Sub-Contract Work efficiently and in accordance with the Scope of Work.

C 3.3.2.3 LAWS AND REGULATIONS

The Contractor shall ensure that the Sub-Contractor(s) complies with the paying of all amounts due in respect of his employees and himself in terms of all relevant legislation and regulations including, but not confined to the following:

- Income Tax Act, the
- Compensation for Occupational Injuries and Diseases Act,
- Unemployment Insurance Act,
- Basic Conditions of Employment Act,
- Occupational Health and Safety Act Construction Regulations

C 3.3.2.4 RESOURCES TO COMPLETE SUB-CONTRACT WORK

Although it is preferred by Employer's Agent that the Contractor ensure that the Sub-Contractor(s) supply all required resources such as labourers, equipment, hand tools, power-driven tools if need be, which are required by him for the execution of the Sub-Contract Work, however the onus is upon the Contractor to determine the extent of resources the Sub-Contractor shall supply to ensure that the works are completed in time. The agreement between the Contractor and Sub-Contractor is the Contractor's responsibility and Employer's Agent is indemnified from any agreements entered between Contractor and his Sub-Contractor (s)

C 3.3.2.5 PRICING

Sub-contracting work will be allocated based on the speciality of the task and the relevant CIBD grading of the sub-contractor

C 3.3.2.6 PAYMENT

The Contractor shall ensure that sub-Contractor(s) are paid within stipulated time as per the Agreement with the Sub-Contract failure which the Contractor can be reported to the Employers' Supply Chain Department and may prejudice his future employment with The Client.

C 3.3.2.7 RETENTION MONIES

The Employer will deduct Retention money for the overall works including the Sub-Contract work at the percentage stated in the Contract Data.

C 3.3.2.8 RESOLUTION OF DISPUTES

Should any dispute between the Contractor and the Sub-Contract arise out of the provisions of the Sub-Contract, or the execution of the Sub-Contract Work, every effort shall be made by the Parties to resolve the matter themselves without the intervention of the Employer. The agreement signed between the Contractor and sub-Contractor should state dispute resolution procedure.

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C3.4 CONSTRUCTION

C3.4 CONSTRUCTION

C3.4.1 Works specifications

The applicable “Standardized specifications.” shall be the “SANS 1200 Standardized specifications ", read together with the Particular Specifications.

Bidders, Contractors and Sub-Contractors shall obtain their own copies of the document “applicable SANS 1200 Standardized specifications”, for tendering purposes and for use for the duration of the Contract from the Sekhukhune District Municipality and shall bear all expenses in this regard.

The Standard Specifications have been written to cover all types of municipal civil engineering works and it may therefore cover work not applicable to this Contract.

The Particular Specifications together with the Drawings and Bill of Quantities clearly indicate the sections of the Standard Specifications which apply to this Contract

C3.4.1.1 Particular Specifications

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

PC : Trimming of site
PD : Maintenance
PE : Contingencies
PLI: Particular Specification for Generic Labour-intensive Specification

Section C3.6 covers references to the Particular Specifications in the Standard Specifications as well as variations and additions to the Standard Specifications.

Section C3.7 covers corrections and amendments to the Standard Specifications for Municipal Civil Engineering Works, Third Edition 2005

C3.4.1.2 Variations and Additions to the SANS 1200 Standardized Specifications

Variations and additions to the following SANS 1200 Standardized Specifications listed in C3.4.1 are given in section C3.4.6.

C3.4.2 Site Facilities

1. Water Supply

Potable water supply available

Potable water supply is available for use by the contractor if granted permission by the municipality. The current tariffs applicable are available from the water and sanitation division. The Municipality can only draw water from fire hydrants specified by the municipality in exceptional circumstances and then only after written authority had been granted. When permission is granted, the water must be drawn through a metered stand pipe issued by the water and sanitation division.

The Contractor shall cease to operate until other arrangements have been made for the supply of water. No claims for delay so caused will be considered.

No warranty is offered or given by the Employer that the existing available reticulated water supply will necessarily be adequate for the Contractor's purposes nor that such supply is in any way guaranteed.

All charges as may be levied by the responsible water supply authority in respect of water consumed by the Contractor shall be for the Contractor's account and payment to the Contractor in respect thereof shall, in accordance with the provisions of subclause C3.4.2.2(b), be deemed to be included in the sums bided by the Contractor for the various Preliminary and General items listed in the Schedule of Quantities, as well as in the rates bided by the Contractor for the various other items listed in the Schedule of Quantities which require the consumption of water.

The Contractor shall, when reasonably required by the Engineer, produce documentary proof that all amounts as may have become due and payable by the Contractor to the responsible water authority have been promptly paid in full.

2. Electricity power Supply

The Contractor shall make his own arrangements for the supply of electricity power to suit his own and the Employer's Agent's requirements and operations. The cost of providing connections any transformer sub-stations and switch gear, generators fuel and/or overhead power lines or underground cables required to supply the electric power shall be included in the rates entered in the Schedule. The cost of electric power consumption for construction, rock drilling. Machinery operations a lighting, ventilation and domestic use are to be included in the rates in the schedule of Quantities for the various construction and operations.

3. Access Roads

Where the locality of works requires it, the Contractor shall grade or construct. And keep in good and constant repair, temporary access roads connecting public roads in the vicinity with the works. Such roads must be of a sufficiently high standard for reliable access of heavy transport vehicle in all weathers and shall communicate with all parts of the works.

4. Use of Site

All notice boards. Sign boards and advertisement at the site shall be subject to the Employer's Agents approval. The Contractor shall take all precautions to preserve trees other than those which, of necessity, must be removed to fulfil the Contract.

The Contractor shall maintain the site in a clean, orderly and sanitary condition and shall take all necessary steps and precautions to prevent the pollution of the surrounding area by his employees or animals in any way. These steps and precautions shall be to the satisfaction of the Employer's Agent and Medical Officer of Health of Madibeng.

5. Precautions against Nuisance

The Contractor's attention is drawn to the fact that operations are being conducted in a semi-urban area and in the presence of traffic. Special precautions must be taken to protect the public and to prevent unnecessary noise, dust or other nuisance.

Plant used on the works shall be as efficiently silenced as possible and noisy operations will be permitted only between the hours of 7H00 am and 5H00 pm. Any work outside normal hours will be permitted only on the written authority of the Employer's Agent.

Whenever machinery is excavating or loading material which is liable to form a dust nuisance, an effective method of spraying water over the cut area and loaded material shall

be installed. Tarpaulins shall be provided to cover trucks and prevent dust blowing from loads during transport.

Any rock or debris falling from trucks on the roads in use by the public shall be removed immediately. Precautions shall be taken to prevent fouling of public roads of completed construction by trucks transporting muddy material. The Employer's Agent may order the Contractor continuously to broom off and clean roads where the mud tracking of vehicles or falling debris may constitute a danger to the travelling public.

6. Sanitary Accommodation

The Contractor shall provide, maintain, move to position as required and finally remove proper sanitary accommodation at each work. Front sanitary accommodation shall be properly screened and its use strictly enforced. The situation of sanitary accommodation prescribed in terms of the Sanitary General By-Laws shall be approved by the Employer's Agent as being convenient for the person whose use it is intended.

The sanitary accommodation provided must be adequately ventilated. Properly disinfected and kept in a thoroughly clean condition at all times.

The Contractor shall make arrangements for the provision of the sewer connection in the case of water closets or the removal of pails in the case of pail closets.

The Contractor shall bear all costs associated with the provision of sanitary accommodation. Compensation for these costs will be made under the relevant item the schedule of Quantities.

7. Work in Servitudes

The Contractor shall give 7 days' advance notice to both the Employer's Agent and the property owner of his intention to commence work in servitude. The Contractor shall not permit his workmen and labourers to use the servitude as a temporary right-of-way and shall carry out the expeditiously and with minimum inconvenience to the occupiers and to owners of adjacent property.

The Contractor shall take all necessary precautions for the protection of person's livestock, buildings and property. The soil shall be kept segregated and all gardens, fences, path etc. shall be reinstated to their former condition.

Where acquisition of servitude has been finalized it may not be possible to obtain continuity of the work. The Contractor will be required temporarily to omit such sections until instructed that the work may proceed.

No extra payment will be made to the Contractor should it be necessary to omit sections and return to them later. It is not intended, however, that the Contractor should be called upon to return to the Site after all other sections of the Contract have been completed and the Contractor has removed his plant and equipment.
Trees removed in servitude shall remain the property of the stand owners if required by them.

8. Access to Premises

The Contractor shall maintain adequate access to all public and private properties at all times unless otherwise sanctioned by the Employer's Agent. Details of the proposed methods of providing access shall be submitted to the Employer's Agent for approval before such access is restricted. Any claims arising from impeded access shall be wholly the responsibility of the Contractor.

Provision shall be made to allow sanitary services to stand to be unimpeded.

Where necessary to permit access or egress, the Contractor shall provide for the laying of planks or other excavated and filled works or ever concrete or asphalted surfaces in order to protect the work from damage.

Any temporary wooden bridges shall be provided with suitable tubular or other hand rail and horizontal member shall be placed at 0,3m, 0.9m and 1,2m above the level of the boards.

Vehicular access shall be maintained to properties at the end of each day's work unless the Contractor as made alternative arrangement with the owners.

9. Waterways

Free waterways shall be maintained in gutter, drains streams. Etc. and existing conditions shall not be changed by deposition spoil in waterways or by diverting water into private property

The Contractor shall settle all claims and make good any damage at his own expense should flooding of public property occur through waterways being obstructed or diverted as a result of his operations.

10. Permits and wayleave

The Contractor shall be responsible to obtain all the wayleave required under this Contract. A separate payment item has been included under Section 1200 A of the Schedule of Quantities to compensate the Contractor for all his expenses to obtain the wayleave.

The wayleave to be obtained by the Contractor consists mainly of the following:

C3.4.3 Features requiring special attention

(a) Site maintenance

During progress of the work and upon completion thereof, the Site of the Works shall be kept and left in a clean and orderly condition. The Contractor shall store materials and equipment for which he is responsible in an orderly manner, and shall keep the Site free from debris and obstructions.

(b) Testing and quality control

(I) CONTRACTOR TO ENGAGE SERVICES OF AN INDEPENDENT LABORATORY

Notwithstanding the requirements of the Specifications pertaining to testing and quality control, the Contractor shall engage the services of an approved independent laboratory to undertake all testing of materials, the results of which are specified in, or may reasonably be inferred from, the Contract. These results will be taken into consideration by the Employer's Agent in deciding whether the quality of materials utilised, and workmanship achieved by the Contractor comply with the requirements of the Specifications. The foregoing shall apply irrespective of whether the specifications indicate that the said testing is to be carried out by the Engineer or by the Contractor.

The Contractor shall be responsible for arranging with the independent testing laboratory for the timeous carrying out of all such testing specified in the Contract, at not less than the frequencies and in the manner specified. The Contractor shall promptly provide the

Engineer with copies of the results of all such testing carried out by the independent laboratory.

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

The test results for tests conducted each month shall be submitted together with the interim payment certificate for that month. Failure to conduct the tests as per the specifications will result in non-payment of the Contractor's claim until such tests are conducted and results certified to have met requirements.

The handling, storage, transport, and erection of equipment, machinery, and materials shall be strictly in accordance with the requirements of the supplier and/or manufacturer. All materials shall be new and of the best quality available unless otherwise specified. They must function satisfactorily under prevailing climate and weather conditions at the place of installations.

For the purposes of this clause, an "independent laboratory" shall mean an "approved laboratory" (as defined in subclause PSA 7.2) which is not under the management or control of the Contractor and in which the Contractor has no financial interest, nor which has any control or financial interest in the Contractor.

(II) ADDITIONAL TESTING REQUIRED BY THE ENGINEER

In addition to the provisions of subclause C3.4.2.5(b)(i): Contractor to engage services of an independent laboratory, the Engineer shall be entitled at times during the Contract to require that the Contractor arrange with the independent laboratory to carry out any such tests, additional to those described in subclause C3.4.2.5(b)(i), at such times and at such locations in the Works as the Engineer shall prescribe. The Contractor shall promptly and without delay arrange with the independent laboratory for carrying out all such additional testing as required by the Engineer, and copies of the test results shall be promptly submitted to the Engineer.

(III) COSTS OF TESTING

(a) Tests in terms of subclause C3.4.2.5(c)(i)

The costs of all testing carried out by the independent laboratory in accordance with the requirements of subclause C3.4.2.5(c)(i), above shall be borne by the Contractor and shall be deemed to be included in the bidded rates and prices for the respective items of work as listed in the Schedule of Quantities and which require testing in terms of the Specifications. No separate payments will be made by the Employer to the Contractor in respect of any testing carried out in terms of subclause C3.4.2.5(c)(i).

Where, as a result of the consistency of the materials varying or as a result of failure to meet the required specifications for the work, it becomes necessary to carry out additional tests (eg re-tests on rectified work and/or replacement materials), the costs of such additional testing shall be for the Contractor's account.

(b) Additional tests required by the Engineer

The costs of any additional tests required by the Engineer in terms of subclause C3.4.2.5(b)(i): Additional testing required by the Engineer, shall be reimbursed to the Contractor against substitution of the Provisional Sum allowed therefore in the Schedule of Quantities; provided always that the costs of any such additional tests ordered by the Engineer, the results of which indicate that the quality of the materials utilised and/or the

standard of workmanship achieved are/is not in accordance with the specifications, shall not be reimbursable to the Contractor

(c) Sub-Contract's

All matters pertaining to Sub-Contract's (including Nominated Sub-Contract's) and the work executed by them shall be dealt with directly between the Employer's Agent and the Contractor in the context of all Sub-Contract work being an integral part of the Works for which the Contractor is responsible. The Employer must be supplied with a copy of the contract/agreement for records.

The Engineer will not liaise directly with any Sub-Contract's nor will he issue instructions concerning the Sub-Contract works directly to any Sub-Contract.

All matters arising from the Sub-Contract agreements shall be dealt with directly between the Contractor and the Sub-Contract's and the Employer's Agent will not become involved.

(d) Opening up and closing down of designated borrow pits

Measurement and payment for opening up and closing down designated borrow pits, including removing and stockpiling overburden and restoring the Site, shall be made under item 8.3.4 of SANS 1200 D. This item applies to all borrow material required under this Contract.

The requirements of subclause 5.2.2.2 of SANS 1200 D regarding the opening up, maintenance and closing down of borrow pits shall be adhered to.

C3.4.4 Plant and construction equipment

The Contractor is encouraged to hire plant and construction equipment from local community where possible.

All items of plant used on the works shall be approved, mordent, efficient plant, well suited to the purpose for which the Contractor uses them and shall be properly maintained items of plant which leak oil or which, in the opinion of the Employer's Agent's generate excessive noise, smoke, or other nuisance shall be removed from the works. The Employer's Agent's decision in this respect shall be final and binding upon the Contractor

All vehicles used on the works are to be sound mechanical condition and shall conform to and be operated in accordance with the Northwest Provincial Ordinance and the Northwest Provincial Road Traffic regulations. All vehicles must be fully insured against accident or loss including third party risk and the Contractor shall produce evidence of this if required by the Employer's Agent.

The Contractor shall be deemed to have established the extent to which mechanical plant can be used for excavating and refilling before the submission of is tender. The Employer's Agent's authority to use mechanical plant will not be unreasonably withheld, but if in the Employer's Agent's opinion, circumstances exist which make it desirable that the use of plant should be suspended either temporarily or permanently, the Contractor shall change the method of performing the work affected at his own cost and he shall be deemed to have no cause for claim if any order issued by the Employer's Agent results in the mechanical plant having to stand idle for a period of any duration whatsoever or having to be removed.

In particular, where it is impossible due to proximity to existing structures or services to excavate except by hand methods then in such cases it shall be deemed reasonable for the

purpose of this clause for the Employer's Agent to withhold authority to use mechanical plant.

C3.4.4.1 Facilities provided by the Contractor

(a) Facilities for the Engineer

The Contractor shall provide on the Site, for the duration of the Contract and for the exclusive use of the Engineer and/or his Representative (as applicable), the various facilities described hereunder. All such facilities shall be provided promptly on the commencement of the Contract and failure on the part of the Contractor to provide any facility required in terms of this specification shall constitute grounds for the Engineer to withhold payment of the Contractor's bidded Preliminary and General items until the facility has been provided or restored as the case may be.

i). Office accommodation

The Contractor shall provide on the Site One office for the exclusive use of the Engineer. Such office shall comply with and be furnished in accordance with the requirements of subclause 3.2 of SANS 1200 AB. The Contractor shall maintain the office(s) in accordance with the requirements of subclause 5.2 of SANS 1200 AB. Such office accommodation shall be provided within the Contractor's site establishment facilities.

iii). Contract name boards

The Contractor shall provide, erect and maintain one Contract name board at such positions and locations as are directed by the Employer's Agent, in accordance with the requirements set out in SANS 1200 AB (as amended).

The Contractor shall before order or manufacturing any such Contract nameboard, obtain the Employer's Agent's written approval in respect of all names and wording to appear on the Contract nameboard.

iv). Survey equipment and assistants

• Survey equipment

The Contractor shall, in accordance with the requirements of SANS 1200 AB (as amended) provide the following survey equipment for the exclusive use of the Engineer and his staff:

- 1 upright reading automatic level with tripod.
- 1 metric levelling staff with protective cover bag.
- 6 ranging rods.
- 1 100 metre Stilon tape measure.
- 1 ± 2 kg hammer.

Whenever reasonably required by the Engineer, the Contractor shall, in accordance with the requirements of SANS 1200 AB (as amended), make available to the Engineer or his representative, the following additional survey equipment:

• Survey assistants

The Contractor shall, in accordance with the requirements of subclause 5.5 of SANS 1200 AB, make available to the Engineer, two (2) survey assistants.

vi). 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 the original licence agreements and disks shall be provided to the Engineer for safekeeping:

(a) Microsoft Windows 10
(b) MS-Office business/ Microsoft 365
(c) Laptop -i7;16GB RAM; 500GB; SSD or 1TB HDD

All computer equipment provided shall be kept fully serviceable at all 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 Employer's Agent staff.

The Contractor shall further provide at his own cost, all paper and black ink cartridges and other consumables reasonably required by the Engineer.

vii). Electricity supply for the Engineer

All electricity supply to the Employer's Agent office(s) and laboratory (if applicable), whether provided by the Contractor by way of a reticulated supply from a local authority or other authorised electricity supply, or by way of on-site generators, shall be regulated by the Contractor to within limits such as to prevent damage due to fluctuations in the electrical current supply that may occur to any electrical plant and equipment provided by the Contractor or the Engineer.

The Contractor shall be liable for and pay to the Engineer on demand, all costs that the Engineer may incur in the repair or replacement of any electrical equipment provided by the Engineer on the Site. Reliance by the Contractor on the regulation of the electrical supply by the supplier or on current regulators fitted to generators shall not absolve the Contractor of his liabilities in terms of this Subclause and, where appropriate, the Contractor shall provide and install at his own cost, all such electrical current-regulating equipment as is necessary to prevent damage to the said equipment.

viii). Site instruction book

The Contractor shall keep a triplicate book for site instructions on the Site at all times.

ix). Housing for Employer's Agent Representative (Example only)

The Engineer will provide housing for the Employer's Agent Representative. The housing and the relevant services and local authority rates and charges shall be paid by the Contractor on the written instruction of the Engineer, from a Prime Cost Sum included in Section 1200 A of the Schedule of Quantities for this purpose.

The Contractor is entitled to a percentage of the value of each payment to the Engineer to cover his expenses in this regard. (See item PSA 8.6.)

C3.4.5 Materials

C3.4.5.1 General

All material supplied shall be to SANS, JASWIC and the General Managers applicable specification as amended or where no such specification, to the approval of the Employer's Agent. Specification not contained in the document may be examined by arrangement at the water and sanitation Division. It will be required from each Contractor to supply proof of conformation to the relevant SANS specifications of all material envisaged to be used on the Contract to the Employer's Agent for his approval

C3.4.5.2 Storage

All materials shall be stored in storage areas which shall be agreed by Employer's Agent and shall be fenced with 1, 8 m high chain link fencing and a lockable gate. Pipes shall be stacked of the ground. Pipes shall be covered to prevent deterioration through ultra-violet attack.

C3.4.6 General Matters

1. Consumer Complaints

Save in respect of the liability arising from clause 21, the Contractor's responsibility in respect of no water or poor pressure complaints arising out of the execution of the Contract shall be limited to ensuring that an adequate cold-water supply exists to the complainant's property.

2. Advertisement in the Media and Notifications to consumers

The Employer's Agent will arrange any media advertisement necessary for warning the public of any shut down of supply necessary, in his opinion, for the proper execution of the works. The Contractor must however, give at least 14 (fourteen) days' notice to the Employer's Agent of his requirements in the respect. Specifically, media advertisements will be arranged when the number of consumers affected by a shutdown is such that issuing notices to individual consumers as provided hereunder is impracticable. Planned interruptions of water supply shall only be permitted between 09h00 and 15h00 unless otherwise authorized in writing by the Employer's Agent.

The Contractor shall give all consumers affected at least 24 hours' notice in writing of his proposals in regard to every planned interruption of water supply necessary for the execution of his work. Failure to do will result in the suspension of work for a period as determined by the Employer's Agent.

The Contractor shall give written notice to all consumers adjacent to the planned route of work to be done. This notice shall be given well in advance of the starting date of construction. The notice will inform the residence that all grass, irrigation and valuable must be removed beforehand.

3. Use of Explosives

Explosiveness shall not be used without the written permission of the Employer's Agent. A procedure must be issued prior to the works for approval by the Employer's Agent.

C3.4.7 Construction Issues

1. Excavation, backfilling and reinstatement

Excavation, backfilling and reinstatement shall be carried out in accordance with the project specification and the standard specification for municipal civil Engineer work all excavations shall be performed in terms of the construction Regulation 2014 of the occupational Health and safety Act.

2. Clearing and Grubbing

If any paying is to be removed to place the new water pipeline in position the rate for the breaking out and removal of the paving shall be claimed under 8.3.2.1 section 1200D in the

schedule of Quantity. No clearing and grubbing will be paid where the new pipelines are to be laid on the sidewalk (area between the road and the erf boundary fence)

It must be noticed that the area between the erf boundary and the road must be clean, with no stones or rocks which can damage any machine used to cut the lawn.

3. Excavations

a) Trenches - General

Trenches shall be back filled level with adjacent surfaces immediately after completion of pipe laying. Should pipe laying not be complete before is due to cease for the day the Employer's agent shall be entitled to instruct the Contractor to backfill the trench and re-excavate it the following morning in order to complete pipe laying. The cost of the above shall be included in the Contractor's rates for excavation.

Pads shall be fitted to the outriggers of excavating plant to prevent damage to road surface. Damage to any surfaces beyond the trench widths specified shall be repaired at the Contractor's expense.

b) Trenches Across Roads

Even if a trenching machine is used road surfaces shall first be cut with a diamond tipped saw or other approved method. After the trench has been backfilled and compacted the road surface has to be cut again, 200mm from the edge on both sides of the trench.

The length of premix cut shall be measured and paid for under the relevant item on the bill. Section 1200D as provided in the schedule of Quantities. The complete closure of any road shall not be permitted without the written consent of the Employer's Agent.

During the time that the trenches have been backfilled and the time that the Municipality reinstates the road surfaces, the Contractor will be responsible for the maintenance on the road.

The trench will be backfilled above the selected material with G4 material in 150mm layers stabilized with 3% cement, compacted to 95% MOD AASHTO and paid for under relevant item on the bill. Section 1200D as provided in the schedule of Quantities. No haulage will be paid separate but the rate for haulage must be included in 8.2.5 Section 1200LB.

c) Trenches – Paving and driveways act

The last 450mm of backing in the trench will be done with G4 material compacted to 95% MOD AASHTO payment will be in accordance with 8.3.21. Section 1200D, no haulage is payable.

d) Removal of Excavated Material

Excavated material shall not remain on the work site for more than 48 hours

The Contractor's scheduled rates shall cover the cost of complying with this restriction including inter alia the cost of removing off site to temporary and then returning to site, excavated material suitable for use as backfill or bedding No haulage will be paid separately but the rate for haulage must be included in 8.2.5. Section 1200LB.

e) Maintenance of Excavations

Existing mains are in general local at a cover depth from 0,6m to 1,5m and excavation to at least this depth will be required for tie-ins etc.

The Contractor shall be solely and entirely responsible for maintaining excavations in a safe condition and this responsibility shall be in no way diminished by any instruction by the Employer's Agent to take additional or improved protected or precautionary measures.

It should be noted by Bidders that plastic tape is not regarded as adequate protection around excavations and its use for that purpose shall not be allowed.

Barricades with two (2) horizontal bars will be used. The top bar must be at least 1.2m high. Both bars must be chevron painted-red white. The rate must include full compensation for the moving and maintenance of all barricades for the duration of the Contract.

f) Classification For Excavation Purposes

The Engineer shall classify excavated materials as Soft Class and Rock will be measured individually as extra-over items.

TABLE 1: Classification of Materials

CLASSIFICATION	DESCRIPTION
Soft	All material 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 or 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 Construction Manager will supply necessary pneumatic equipment and arrange for others to break up rock into manageable pieces.

g)Depth of Excavations

The minimum cover to new mains shall be 1 200mm.

h)Intermediate Material

Intermediate material will be classified as material where the use of pneumatic tools such as paving breakers before removal.

i) Hard Material

Hard material will be classified as material where mechanical plant, such as compressors and jack hammers or blasting is required.

4. Testing of Backfill Material

The compacted density of the backfill material shall be in accordance with section 202 of the standard specification.
If the required compacted density cannot be achieved with the excavated material, G4 material will be imported and compacted to the required density for base layers. Payment will be made under 8.3.21. Section 1200D of the Standard Specification and no haulage will be paid separately, but the rate for haulage must be included in 8.2.5. Section 1200LB

The Contractor will be required to submit at least 3 lab tests for compaction, or as required by the Employer's Agent, per block completed and one per road crossing. No payment will be approved if the tests have not been included in the rates. No additional payment will be done for the compaction tests.

5. Reinstatement

The Contractor shall be responsible for the maintenance and reinstatement of damage caused by him or his agents/deliveries to any property (Private or State Owned), fauna and flora and rights of way.

The Contractor shall take cognisance of the aforementioned items and should allow in his rates tendered for any costs that could be incurred due to damages by the Contractor.

6. INSPECTION AT INTERMEDIATE STAGES OF CONSTRUCTION

The Contractor shall call for an inspection of the works at the following remediate stages of construction.

i. After completion of the trench excavation and of the trench bottom, and before any pipe is laid
ii. After the selected backfill, material has been placed around the pipe; and before the remainder of the trench is backfilled.

Work shall not progress through the specified stages without the approval of the Employer's Agent or his representative on site.

Failure to comply with the provision of this clause shall result in the suspension of work for a period as determined by the Employer's Agent.

7. EXTENSION OF TIME DUE TO UNPREDICTABLE WEATHER CIRCUMSTANCES

Extension of time will not be considered for normal adverse weather conditions but only for abnormal rainfall or saturated conditions and will be calculated in accordance with Sub-Clause 5.12.2.2 method 1 of the special Conditions of Contract.

The factor (Nw - Nn) shall be considered to represent a fair allowance for days during which rainfall exceeds 10 mm and the factor (Rw - Rn)/x shall be considered to represent a fair allowance for those days when rainfall does not exceed 10 mm but wet conditions prevent or disrupt work.

The total extension of time shall be the algebraic sum of all monthly totals for the Contract period, but if the algebraic sum is negative the time for completion shall not be reduced due

to subnormal rainfall. Extensions of time for a part of a month shall be calculated using pro rata values of Nn and Rn."

For this project the rainfall formula will only apply as background information, or dispute resolution. Extension of time for rainfall will only be granted on Actual Delays experienced; noted and agreed upon by the Engineer.

8. PIPE AND MANHOLE TESTS

The Contractor shall arrange for his own process control tests. The Contractor will be expected of to employ the services of the existing established laboratory on site. The Contractor must submit the results of tests carried out on materials and workmanship when submitting work for acceptance by the Employer's Agent. The costs for these tests shall be deemed to be included in the relevant rates and no additional payment will be made for testing as required.

The process control test results submitted by the Contractor for approval of materials and workmanship may be used by the Employer's Agent for acceptance control. However, before accepting any work, the Employer's Agent shall have his own acceptance control tests carried out by the laboratory. The cost of acceptance testing shall be to the account of the client.

9. Replacement of Leads (Pipe Jacking)

a) Trenchless Construction

A horizontal boring or auger machine shall be used for the installation of pipes under paved surfaces and road crossing where soil condition permits any plant used for the purpose of demonstrating whether trenchless construction is practical or not shall be in good order. Where soil conditions preclude the use of boring or auger machines under paved surfaces and road crossing. Leads shall be installed by open trenching.

Approval for open trenching must be obtained from the Employer's Agent under these circumstances' trenches shall be backfilled immediately after completion of pipe laying should pipe laying not be complete before work is due to cease for the day, the Employer's Agent shall be entitled to instruct the Constructor to backfill the trench and re-excavate it the following morning in order to complete pipe laying. The cost of the above shall be included in the Contractors rates for excavation.

If a trenching machine is used for road crossing. The road shall first be cut with a diamond tipped saw or other approved method, all trenches across the road shall be cut at right angles to the kerb. Damage to the road surface beyond the trench widths specified shall be repaired at the Contractors expense.

The length on premix cut shall be measured and paid for under item providing for in the schedule of quantities (refer to 8.3.2.1 Section 1200d)

C3.4.8 Contractor's Employees

1. MINIMUM EMPLOYMENT CONDITIONS FOR CONVENTIONAL CONSTRUCTION WORKS

Contractors shall comply with the Basic Conditions of Employment Act (Act No 75 of 1997).

As a determination has not been made in terms of the aforesaid Act for the building sector, the minimum employment conditions which will apply to this Contract shall be guided by the Sectoral Determination: Civil Engineering Sector published in the Government Gazette dated 2 March 2001.

The following minimum conditions shall apply to this Contract and Contractors shall include such conditions in employment Contracts.

1.1 Employment Contracts

The Contractor shall enter into an employment Contract with every one of his/her employees, including short-term Contract s i.e., Contract s in which employment commencement and employment termination dates are specified. Short-term employment Contract s will also apply an employee employed for only one day (see proforma Contract on Annexure 1).

1.2 Normal working hours

Normal working hours are from 07:00 to 17:00 from Monday to Friday. A tea break is taken from 09:00 to 09:15 and lunch from 12:30 to 13:00.

Actual hours to work and be paid for is 9 hours per day. If a lunch break of one (1) hour is taken then the normal working day will be as follow:
Morning work sessions from 07:00 to 12:00, lunch break from 12:00 to 13:00, and afternoon sessions from 13:00 to 17:00.

1.3 Minimum wages

Minimum wages shall be according to the Government Gazetted rates for the Department of Labour. For a full day's work, the hourly rate shall be multiplied by 9. Normal 5-day week hours of work shall be 45 hours and the wage calculated according to the applicable hourly rate.

Overtime pay shall be 1.5 times the ordinary wage.

An employee shall be paid fortnightly.

1.4 Short time (excluding short time due to inclement weather)

If for reasons, which may be ascribed to the employee, e.g., arriving late for work or taking an afternoon off, the hours not worked shall be deducted from the daily wage calculation.

1.5 Short time resulting from inclement weather

i. If the Contractor informs his/her employees that no work will be done the following day due to inclement weather, no payment will be due to the employee for such a day.

ii. If the Contractor has not informed his/her employees that no work will be done due to inclement weather and no work or less than four (4) hours of work is possible during a day, the Contractor must pay the employee for four (4) hours of work. If more than four (4) hours of work is done, the Contractor shall pay the employee for the number of hours worked.

1.6 Vacation leave

If an employee has been in full time employment for more than four (4) months, he/she shall be entitled to 1 day's paid leave for every seventeen (17) days the employee worked or was entitled to payment.

1.7 Family responsibility leave

If an employee has been in full time employment for more than four (4) months, he/she shall be entitled to three days paid leave in a leave cycle of thirty-six (36) months of employment:

i. When the employee's child is born;
ii. When the employee's child is sick;
iii. In the event of death of the employee's spouse or life partner, parent, grandparent, child or grandchild.

The employee shall provide the required proof to the Contractor of the event, failing which the leave shall be unpaid leave

1.8 Maternity leave

At least four (4) months unpaid leave.

1.9 Sick leave

The employee shall be entitled to one (1) day's paid sick leave of normal wages for every twenty-six (26) days worked.

If an employee is absent for three (3) or more consecutive days, the employee shall provide a sick certificate from a registered medical practitioner to qualify for sick leave payment. If such certificate is not provided, no sick leave payment will be due to the employee.

1.10 Piece work

Irrespective of the quantity of work done under a piece work system during a working week, the employee shall be entitled to a minimum of a week's wages determined as if no piece work applied.

The Contractor or employee may terminate an employment Contract by giving notice of termination of not less than:

i. On short period Contract s i.e., a Contract which states from which date work employment commences and on which day employment terminates, the terms of the employment Contract shall apply;

a) One week if employee has been employed for four (4) weeks or less, unless it is a short-term project;

i. Two (2) weeks if employee has been employed for more than four (4) weeks but not more than one (1) year;

i. Four (4) weeks if employee has been employed for more than one year.

2. EMPLOYMENT CONDITIONS FOR LABOUR INTENSIVE WORKS AND CONSTRUCTION

The Ministerial Determination, Special Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice Nº R63 of 25 January 2002, as reproduced below, shall apply to works described in scope of work as being labour intensive and which are undertaken by unskilled or semi-skilled workers.

This clause contains the standard terms and conditions for workers employed in elementary occupations on a Special Public Works Programme (SPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of a SPWP.

2.1 Terminology

a) "Department" means any department of the State, implementing agent or Contractor;
b) "Employer" means any department, implementing agency or Contractor that hires workers to work in elementary occupations on a SPWP;
c) "Workers" means any person working in an elementary occupation on a SPWP;
d) "Elementary occupation" means ay occupation involving unskilled or semi-skilled work;
e) "Management" means any person employed by a department or implementing agency to administer or execute an SPWP'
f) "Task" means a fixed quantity of work;
g) "Task-based work" means work in which a worker is paid a fixed rate for performing a task;
h) "Task-rated worker" means a worker paid on the basis of the number of tasks completed;
i) "Time-rated worker" means a worker paid on the basis of the length of time orked.

2.2 Terms of Work

2.2.1 Workers on a SPWP are employed on a temporary basis.
2.2.2 A worker may NOT be employed for longer than 24 months in any five-year cycle on a SPWP.
2.2.3 Employment on a SPWP does not qualify as employment as a contributor for the purposes of the Unemployment Insurance ACT 30 of 1966.

2.3 Normal Hours of Work

2.3.1 An employer may not set tasks or hours of work that require a worker to work:

a) more than forty hours in any week;
b) on more than five days in any week; and
c) for more than eight hours on any day.

2.2.4 An employer and worker may agree that a worker will work four days per week. The worker may then work up to ten hours per day.

2.2.5 A task-rated worker may not work more than a total of 55 hours in any week to complete the tasks allocated (based on a 40-hour week) to that worker.

2.4 Meal Breaks

2.4.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.
2.4.2 An employer and worker may agree on longer meal breaks.
2.4.3 A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is

relieved of his or her duties during the meal break.

2.4.4 A worker is not entitled to payment for the period of a meal break. However, a worker who is paid on the basis of time worked must be paid if the worker is required to work or to be available for work during the meal break.

2.5 Special Conditions for Security Guards

2.5.1 A security guard may work up to 55 hours per week and up to eleven hours per day.
2.5.2 A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

2.6 Daily Rest Period

Every worker is entitled to a daily rest period of at least eight consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day.

2.7 Weekly Rest Period

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

2.8 Work on Sundays and Public Holidays

2.8.1 A worker may only work on a Sunday or public holiday to perform emergency or security work.
2.8.2 Work on Sundays is paid at the ordinary rate of pay.
2.8.3 A task-rated worker who works on a public holiday must be paid –

(a) the worker's daily task rate, if the worker works for less than four hours;
(b) double the worker's daily task rate, if the worker works for more than four hours.

2.8.4 A time-rated worker who works on public holiday must be paid –

(a) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;
(b) double the worker's daily rate of pay, if the worker works of more than four hours on the public holiday.

2.9 Sick Leave

2.9.1 Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause.
2.9.2 A worker who is unable to work on account of illness or injury is entitled to claim one day's sick leave for every full month that the worker has worked in terms of a Contract.
2.9.3 A worker may accumulate a maximum of twelve days' sick leave in a year.
2.9.4 Accumulated sick-leave may not be transferred from one Contract to another Contract.
2.9.5 An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.
2.9.6 An employer must pay a time-rated worker the worker's daily rate for a day's sick leave.
2.9.7 An employer must pay a worker sick pay on the worker's usual payday.
2.9.8 Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is –

(a) absent from work for more than two consecutive days; or
(b) absent from work on more than two occasions in any eight-week period.

2.9.9 A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.

2.9.10 A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational injuries and Disease Act.

2.10 Maternity Leave

2.10.1 A worker may take up to four consecutive month's unpaid maternity leave.

2.10.2 A worker in not entitled to any payment or employment-related benefits during maternity leave.

2.10.3 A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.

2.10.4 A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.

2.10.5 A worker may begin maternity leave –

(a) four weeks before the expected date of birth; or
(b) on an earlier date –

i. if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or
ii. if agreed to between employer and worker; or

(c) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.

2.10.6 A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.

2.10.7 A worker who returns to work after maternity leave, has the right to start a new cycle of twenty-four months employment, unless the SPWP on which she was employed has ended.

2.11 Family Responsibility Leave

2.11.1 Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances –

(a) when the employee's child is born;
(b) when the employee's child is sick;
(c) in the event of a death of –
i. the employee's spouse or life partner;
ii. the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

2.12 Statement of Conditions

2.12.1 An employer must give a worker a statement containing the following details at the start of employment –

(a) the employer's name and address and the name of the SPWP;
(b) the tasks or job that the worker is to perform; and
(c) the period for which the worker is hired or, if this is not certain, the expected duration of the Contract;
(d) the worker's rate of pay and how this is to be calculated;
(e) the training that the worker will receive during the SPWP.

2.12.2 An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.
2.12.3 An employer must supply each worker with a copy of these conditions of employment.

2.13 Keeping Records

2.13.1 Every employer must keep a written record of at least the following –

(a) the worker's name and position;
(b) in the case of a task-rated worker, the number of tasks completed by the worker;
(c) in the case of a time-rated worker, the time worked by the worker;
(d) payments made to each worker.

2.13.2 The employer must keep this record for a period of at least three years after the completion of the SPWP.

2.14 Payment for the Labour-Intensive Component of the Works

Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the scope of work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in Contract or in delict.

2.13.3 An employer must pay all wages at least monthly in cash or by cheque or into a bank account.
2.13.4 A task-rated worker will only be paid for tasks that have been completed.
2.13.5 An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the Contractor having submitted an invoice to the employer.
2.13.6 A time-rated worker will be paid at the end of each month.
2.13.7 Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.
2.13.8 Payment in cash or by cheque must take place –

(a) at the workplace or at a place agreed to by the worker;
(b) during the worker's working hours or within fifteen minutes of the start or finish of work;
(c) in a sealed envelope which becomes the property of the worker.

2.13.9 An employer must give a worker the following information in writing –

(a) the period for which payment is made;
(b) the numbers of tasks completed or hours worked;
(c) the worker's earnings;
(d) any money deducted from the payment;
(e) the actual amount paid to the worker.

2.13.10 If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.

2.13.11 If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

2.15 Deductions

2.13.12 An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.

2.13.13 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

2.13.14 An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.

2.13.15 An employer may not require or allow a worker to –

a) repay any payment except an overpayment previously made by the employer by mistake;
b) state that the worker received a greater amount of money than the employer actually paid to the worker; or
c) pay the employer or any other person for having been employed.

2.16 Health and Safety

2.13.16 Employers must take all reasonable steps to ensure that the working environment is healthy and safe.

2.13.17 A worker must –

a) work in a way that does not endanger his/her health and safety or that of any other person;
b) obey any health and safety instruction;
c) obey all health and safety rules of the SPWP;
d) use any personal protective equipment or clothing issued by the employer;
e) report any accident, near-miss incident or dangerous behavior by another person to their employer or manager.

2.17 Compensation for Injuries and Diseases

2.13.18 It is the responsibility of the employers (other than a Contractor) to arrange for all persons employed on a SPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.

2.13.19 A worker must report any work-related injury or occupational disease to their employer or manager.

2.13.20 The employer must report the accident or disease to the Compensation Commissioner.

2.13.21 An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

2.18 Termination

2.13.22 The employer may terminate the employment of a worker for good cause after following a fair procedure.

2.13.23 A worker will not receive severance pay on termination.

2.13.24 A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the manager the employer in advance to allow the employer to find a replacement.

2.13.25 A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the Contract. However, the worker may be re- engaged if a position becomes available of the balance for the 24-month period.

2.13.26 A worker who does not attend required training events, without good reason will have terminated the Contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

2.19 Certificate of Service

On the termination of employment, a worker is entitled to a certificate stating –

a) the worker's full name;
b) the name and address of the employer;
c) the SPWP on which the worker worked;
d) the work performed by the worker;
e) any training received by the worker as part of the SPWP;
f) the period for which the worker worked on the SPWP;
g) any other information agreed on by the employer and worker.

2.20 Contractor's default in payment to Labourers and Employees

a) Any dispute between the Contractor and labourers, regarding delayed payment or default in payment of fair wages, if not resolved immediately may compel the Employer to intervene.
b) The Employer may, upon the Contractor defaulting payment, pay the moneys due to the workers not honoured in time, out of any moneys due or which may become due to the Contractor under the Contract.

2.21 Provision of Hand tools

a) The Contractor shall provide his labour force with hand tools of adequate quality, sufficient in numbers and make the necessary provisions to maintain the tools in good and safe working conditions

2.21.1 Reporting

The Contractor shall submit monthly returns/reports as specified below:

a) Signed Muster rolls/pay sheets of temporary workers and permanent staff detailing the number, category, gender, rate of pay and daily attendance.
b) Copies of identity documents of workers
c) Number of persons who have attended training including nature and duration of training provided
d) Assets created, rehabilitated or maintained in accordance with indicators in the EPWP M&E framework
e) Plant utilization returns
f) Progress report detailing production output compared to the programme of works

3. LABOUR-INTENSIVE COMPETENCIES OF SUPERVISORY AND MANAGEMENT STAFF

Established Contractors shall only engage supervisory and management staff in labour intensive works who have either completed, or for the period 1 May 2004 to

30 June 2005, are registered for training towards, the skills programme outlined in Table 1.

Emerging Contractors shall have personally completed, or for the period 1 May 2004 to 30 June 2005 be registered on a skills programme for the NQF level 2-unit standard. All other site supervisory staff in the employ of emerging Contractors must have completed, or for the period 1 May to 2004 to 30 June 2005 be registered on a skills programme for, the NQF level 2-unit standards or NQF level 4-unit standards.

TABLE 1: SKILLS PROGRAMME FOR SUPERVISORY AND MANAGEMENT STAFF

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader/ supervisor	2	Apply Labour Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, and
		Use Labour Intensive Construction Methods to Construct and Maintain Roads and Stormwater Drainage	any one of these 3-unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Foreman/ supervisor	4	Implement labour intensive Construction Systems and Techniques	This unit standard must be completed, and
		Use Labour Intensive Construction Methods to Construct and Maintain Roads and Stormwater Drainage	any one of these 3-unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Site Agent/ Manager (i.e the Contractor's most senior representative that is resident on the site.	5	Manage Labour Intensive Construction Processes	Skills Programme against this single unit standard or part qualification.

Details of these skills programmes may be obtained from the CETA ETQA manager (e-mail: Gerard@ceta.co.za, tel: 011 265 5900)

4. EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR-INTENSIVE WORKS

4.1 Requirements for the Sourcing and Engagement of Labour

4.1.1 Unskilled and semi-skilled labour require for the execution of all labour-intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour.

4.1.2 The rate pay set for the SPWP is R 208.71 per day.
4.1.3 Tasks established by the Contractor must such that:

(a)the average worker completes 5 tasks per week in 40 hours or less; and
(b)the weakest worker completes 5 tasks per week in 55 hours or less.

4.1.4The Contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 4.1.3.

4.1.5The Contractor shall, through all available community structures, inform the local community of the labour-intensive works and the employment opportunities presented thereby. Preference must be given to people with previous practical experience in construction and / or who come from households:

(a) where the head of the household has less than a primary school education;
(b)that have less than one full time person earning an income;
(c) where subsistence agriculture is the source of income;
(d)those who are not in receipt of any social security pension income.

4.1.6The Contractor shall endeavor to ensure that the expenditure on the employment of temporary workers is at least 35% of local labour and in the following proportions:

(a)55 % women;
(b)55 % youth who are between the ages of 18 and 35; and
(c)2 % on persons with disabilities.

4.2 Specific Provisions Pertaining to SANS 1914-5 2002

Definitions:

4.2.1 Targeted labour: Unemployment persons who are employed as local labour on the project.
4.1.7 Contract participation goals
4.2.2.1 there is no specified Contract participation goal for the Contract. The Contract participation goal shall be measured in the performance of the Contract to enable the employment provided to targeted labour to be quantified.
4.2.2.2 The wages and allowances used to calculate the Contract participation goal shall, with respect to both time-related and task rated workers, comprise all wages paid and any training allowance paid in respect of agreed training programmes.
4.2.3 Terms and conditions for the engagement of targeted labour
Further to the provisions of clause 3.3.2 of SANS 1914-5, written Contract s shall be entered into with targeted labour.
4.2.4 Variations to SANS 1914-5
4.2.4.1 The definition for net amount shall be amended as follows:

Financial value of the Contract upon completion, exclusive of any value added tax or sales tax which the law requires the employer to pay the Contractor.

4.2.4.2 The schedule referred to in 5.2 shall in addition reflect the status of targeted labour as women, youth and persons with disabilities and the number of formal trainings provided to targeted labour.

4.3 Training of Targeted Labour

A suitably capable Training consultant (consultants based within SDM are to be given first preference) is to be employed on this project.

Their duty is to identify suitable persons and train them for the following:

i) Employee Training – community-based labour
ii) Employer Training – community-based Contractors
iii) Committee Training – maintenance and operation of the Works (this however falls outside the scope of this Contract)

4.3.1 The Contractor shall provide all the necessary on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the Contract in a manner that does not compromise worker health and safety.

4.3.2 The cost of the formal training of targeted labour, shall be measured and paid for in the schedule of quantities of this Contract Document.

4.2.4.3 The Contractor shall do nothing to dissuade targeted labour from participating in training programmes and shall take all reasonable steps to ensure that each beneficiary is provided with two days of formal training for every 22 days worked.

4.2.4.4 An allowance equal to 100 % of the task rate or daily rate shall be paid by the Contractor to workers who attend formal training, in terms of 4.3.4 above.

4.2.4.5 Proof of compliance with the requirements of 4.3.2 to 4.3.4 must be provided by the Contractor to the Employer prior to submission of the final payment certificate.

Typical training that will be given by the Training Consultant is:

i) <u>Community based Contractors</u>

- Preparation phase – using a calculator, numeracy, using a scale ruler, reading a building plan, handling administrative tasks in the building industry.
- Estimating and tendering – marketing the services of a company, seeking, selecting, collecting and studying tender documents, investigating and assessing a site, developing a bill of quantities from building plants, calculating the cost of a project, finalizing tender prices, completing and submitting a tender.
- Project planning – introducing to planning techniques, pre-tender planning, planning Contract activities, Contract planning, executing a Contract programme.
- Executing the project – managing the finances of the company, managing materials, administering record systems, managing manpower, completion and handover.

ii) <u>Community based labour</u>

Local labour will be taught the following skills:

- Excavation if possible, bedding, selected backfill and backfill
- Pipe laying, valves and fittings
- Valve boxes, manholes, anchor blocks etc.

Again, the Contractor and Training Consultant will have to work closely together to identify what their requirements are and when this labour is needed.

Community based labour training will take place on site before actual production starts. Allowance needs to be made for wages, food or travelling during training.

Training of community-based Contractors will take place at a central point. The Provincial Sum allowed in the Schedule of Quantities, makes allowance for travelling and meals for the training of community-based Contractors.

5. COMMUNITY LIAISON OFFICER

5.1 The successful Bidder shall enter into an agreement with the Ward Councilor/Ward Committee whereby the Ward Councilor shall provide to the Contractor the following if necessary:

a) A Community Liaison Officer (CLO) for liaison with the recipient community, who as part of his/her duties will also act as a Labour Desk Officer (LDO) for labour recruitment.

5.2 The CLO shall attend all site and other meetings concerning the project.

5.3 The agreement shall make provision for the payment by the Contractor to the CLO a maximum amount calculated as follows:

Salary per month = R 5500.00

5.4 Only one CLO shall be appointed per project. If the project spans over more than one Ward or villages, the relevant Ward Councilors shall agree on one CLO to be appointed by the Contractor. Should no agreement be found as envisaged, the relevant Project Manager together with the Executive Director: Integrated Community Development, or their nominees, will interview prospective appointees and in their discretion appoint such CLO.

5.5 Notwithstanding the above, if the vastness of the project requires the use of more than one CLO, this will be permitted provided that the total monthly sum paid to all CLO's shall not exceed the amount allowed for in the Bill of Quantities.

5.6 Should the Contractor experience any difficulties with the community, these difficulties shall immediately be brought to the attention of the Department/Project Manager who shall arrange a meeting with the relevant Ward Councilor(s) and the CLO to resolve such difficulties.

5.7 The main Contractor shall ensure that any Sub-Contractor he may appoint shall adhere to these conditions but also subject to the proviso's applicable to the duration of such sub-Contract.

5.8 Should any of the above conditions be less favorable than any Bargaining Council Agreement or Act applicable to the Contractor, the more favorable condition will apply.

6 Existing services

The Contractor shall protect all existing services

7 Site establishment

a) Contractor's Camp site

The Contractor shall provide a suitable site for his camp and for accommodating the work force. The choice of the site for the establishment of the camp, offices and the layout thereof, shall be approved.

The camp site shall be cleared and grubbed and properly fenced with a security fence around the perimeter. The Contractor is to provide his own security at the camp or on the site if required, at his own expense. No trees may be removed and the Contractor must provide his own firewood.

After completion of the Contract, the Contractor shall remove all his temporary buildings, plant and equipment. The site shall be made good and be left in a neat and tidy condition before the certificate of practical completion shall be issued.

b) Water Supply

The Contractor shall make his own arrangement for potable and construction water. It shall be the responsibility of the Contractor to apply for a water connection for his site camp. The Contractor shall be responsible for payment of all water used. Although there are bulk water pipeline pipes in the village, the water supply is not consistent and water from the Steelpoort river may be used for construction purposes. Water quality shall be verified before use in concrete is allowed.

c) Power Supply

The Contractor shall make his own arrangements.

d) Ablution Facilities

The Contractor shall, at each construction area, provide sufficient portable chemical latrine units. The latrine units shall be serviced daily and kept in a hygienic and orderly state to the approval of the Employer's Agent. No separate payment shall be made for this requirement and the costs thereof shall be deemed to be included in the rates billed for the Contractor's time-related obligations.

e) Cellular Telephone

It is a requirement of the Contract that the Contractor shall equip his site agent(s) with a cellular telephone to allow for effective communication between the Contractor's supervisory personnel and the Employer's Agent's supervisory staff. All the applicable contact details must be made available to the Employer as well as the staff on site. All costs associated with the provision of cellular telephones for the Contractor's personnel shall be deemed to be included in rates billed for time-related charges.

f) Site Facilities required by the Employer's Agent

One site office of approximately 30m² complete with sufficient lighting and power points.

- Two desks, ten chairs, one conference table and two steel filing cabinets.
- Three carports for his exclusive use, a net shade cover will suffice.
- An ablution unit for his exclusive use.

- The Employer's agent does not require housing for personnel or laboratory facilities.

g) PPE (Printing on PPE)

PPE (Overalls) shall be Pantone Orange with/without reflective tape and shall be branded as follows:

- Implementer's Logo (printed or embroidered) on the left front pocket location i.e. over the heart position. (full colour)
- EPWP logo on the right front pocket (printed or embroidered) location (full colour)
- The letters EPWP on the back of the PPE in BLACK
- The program name eg Vuk'uphile is to be printed on the right sleeve of short sleeved apparel and need not be placed on long sleeved apparel.
- Where required, lime green safety vests are to be branded with similar specification above. In this instance the Overalls may not necessarily
- be branded provided that the use of high visibility vests is mandatory.
- All artwork and PPE samples shall be approved and signed off by the consultant prior to printing/embroidering

ANNEXURE 1 – PRO FORMA EPWP CONTRACT OF EMPLOYMENT

PRO FORMA

EXPANDED PUBLIC WORKS PROGRAMME
CONTRACT OF EMPLOYMENT BETWEEN

CONTRACTOR
Name:……

Address:……

ID:……...

AND

WORKER
Name:……

Details:……..

ID:……...

1. I am pleased to confirm that you have been appointed to work on a task based employment contract within the Expanded Public Works Programme (EPWP) project. Within this employment contract you will undertake numerous groups of tasks.
2. This employment contract must be read in conjunction with the standard terms and conditions of employment on EPWP attached herewith.
3. The project where you will be employed is located at……..
4. This employment contract will start on……

   and on end on …….
5. You must be aware that this employment contract is a limited term contract and not a permanent job. This employment contract may be terminated for any one of the following reasons:
   a) The contractor does not get additional contracts through the EPWP.
   b) Funding for the programme in your area comes to an end.
   c) You repeatedly do not perform in terms of the tasks set out in your work programme.
   d) You have worked a maximum of 24 months within a 60 month cycle.
6. You will be employed as a ……..…….. within the team.
7. While you are working you will report to…….
8. Payment
   a) You will be paid a fixed amount of R……..…….. for completing a fixed amount of work.
   b) The amount of work required for the agreed rate of pay will vary from task to task. You will be informed at the beginning of each task or group of tasks how much work you are expected to complete per day.
   c) You will only be paid for work completed.
9. In addition to the conditions above, all the terms and conditions of employment on EPWP apply to your employment. If you breach any of these terms your contract may be terminated.
10. Signatures:

    Signed on this……..... day of…….....

    Contractor: ……Date: ……...

    Worker: ……Date: ……...

    Witness: ……Date: ……...

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

C3.5 MANAGEMENT

C3.5 MANAGEMENT

1. Construction Programme Clause 5.6 of the General Conditions of Contract

The Contractor shall submit within the period stated in the Contract Data a suitable and realistic construction programme for the consideration of the Employer's Agent.

The programme shall be in the form of a Gantt chart and shall include the following details:

- A work breakdown structure, identifying the major activity groups.
- For each activity group further details shall be provided with regard to the scheduled start and end dates of individual activities.
- The linkages between activities shall be clearly indicated and the logical network upon which the programme is based shall be separately submitted to the Employer's Agent if requested. Any constraints shall be classified as being time-related or resource-related.
- The critical path(s) shall be clearly indicated and floats on non-critical activities shall be shown.
- The Contractor shall indicate the working hours per day, night, week and month allowed for in the programme.
- Where relevant the Contractor shall state the production rates for key activities, e.g. earthworks, etc.

Together with the programme as detailed above the Contractor shall submit to the Employer's Agent a cash flow projection, indicating projected monthly invoice amounts. The cash flow projection shall be updated at monthly intervals to reflect actual payments to date and anticipated further payments.

The programme will be reviewed at the monthly site meetings at which the Contractor shall provide sufficient detail that will allow the comparison of completed work per activity that has fallen behind. The updated programme shall be submitted to the Employer's Agent at least two days prior to the monthly meetings.

If the programme has to be revised by reason of the Contractor falling behind his programme, he shall produce a revised programme showing how he intends to regain lost time in order to ensure completion of the Works within the time for completion as defined in Clause 5.6.1 of the General Conditions of Contract or any granted extension of time. Any proposal to increase the tempo of work must be accompanied by positive steps to increase production by providing more labour and plant on site, or by using the available labour and plant on site, or by using the available labour and plant in a more efficient manner.

Failure on the part of the Contractor to submit the programme or to work according to the programme or revised programmes shall be sufficient reason for the Employer's Agent to take steps as provided in Clause 5.7.1 of the General Conditions of Contract.

The approval by the Employer's Agent of any programme shall have no Contractual significance other than that the Employer's Agent will be satisfied that the work is carried out according to such programme and that the Contractor undertakes to carry out the work in accordance with the programme. It shall not limit the right of the Employer's Agent to instruct the Contractor to vary the programme if required by circumstances. The Contractor is also referred to Clause 5.6.2 of the General Conditions of Contract when drawing up his programme.

2. Sequence of the works

The sequence of the works will be in the accordance with the approved programme. The works should be programmed to allow for the installation of the pipeline network to suit the budgeted cash flow and construction period.

3. Accommodation of traffic

The following contain the Employer's general requirements for accommodating the traffic during construction:

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.

Failure to maintain road signs, warning signs, etc, in a good condition shall constitute ample reason for the Employer's Agent to bring the works to a stop until the road signs, etc, have been repaired to his satisfaction.

The Contractor may not commence constructional 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 Volume 2 Chapter 13.

The Contractor shall submit proposals in connection with directional signs to the Employer's Agent for approval prior to construction.

Sufficient signage shall be provided, erected and relocated as necessary by the Contractor to reroute traffic onto the deviations.

4. Extension of time on account of abnormal rainfall

(a) Extension of time in respect of delays resulting from wet climatic conditions on the Site will only be considered in respect of abnormally wet climatic conditions and shall be determined for each calendar month or part thereof, in accordance with the formula given below:

$V = (Nw - Nn) + (Rw - Rn)/X$

in which formula the symbols shall have the following meanings:

V = Potential extension of time in calendar days for the calendar month under consideration:
If V is negative and its absolute value exceeds Nn, then V shall be taken as equal to minus Nn.
When the value of V for any month exceeds the number of days in the particular month, V will be the number of days in the month.

Nw = Actual number of days in the calendar month under consideration on which a rainfall of Y mm or more was recorded on the Site

Nn = Average number of days, derived from existing records of rainfall in the region of the Site, on which a rainfall of Y mm or more was recorded for the calendar month

Rw = Actual rainfall in mm recorded on the Site in an approved rain gauge for the calendar month under consideration

Rn = Average rainfall in mm for the calendar month, derived from existing records of rainfall in the region of the Site

The factor (Nw - Nn) shall be deemed to be a fair allowance for variations from the average number of days during which the rainfall exceeds Y mm.

The factor (Rw - Rn)/X shall be deemed to be a fair allowance for variations from the average number of days during which the rainfall did not exceed Y mm but wet conditions prevented or disrupted work.

(b) The annual rainfall in the area varies between 500mm and 650mm. A vast amount of land is covered by the savannah veld in the Marea. The Sekhukhune district municipal area is characterized by flat to gently sloping Bushveld/ Savannah vegetation in the north and central parts, and a mountainous area to the south which forms the border of the Thembisile local municipality. Cultivated areas (permanent and temporary dry and irrigated land) cover less than 15% of the municipality. Urban areas cover 14% of the municipality.

The potential extension of time V has been calculated for each month and year of the period concerned to indicate the possible effect of the rainfall formula. The values of V were obtained by applying the rainfall formula and using the actual rainfall figures and the calculated values of Rn and Nn indicated in the table.

(c) The Contractor shall, at his own cost, provide and erect on the Site at a location approved by the Engineer, an approved rain gauge, which shall be fenced off in a manner which will prevent any undue interference by workmen and others. The Contractor shall, at his own cost, arrange for the reading of the rain gauge on a daily basis for the duration of the Contract. The gauge readings, as well as the date and time at which the reading was taken shall be recorded in a separate record book provided by the Contractor for this purpose. All entries in the rainfall
record books shall be signed by the person taking the reading and the gauge shall be properly emptied immediately after each reading has been taken. If required by the Engineer, the Engineer shall be entitled to witness the reading of the gauge.

(d) The Contractor's claims in terms of Subclause 10.1 of the Conditions of Contract for extension of time in respect of delays resulting from wet climatic conditions on the Site during each month, shall be submitted in writing to the Engineer monthly;

provided always that

(i) the period allowed to the Contractor in terms of Clause 10.1.1.1 of the Conditions of Contract in which to submit his claim for each month shall be reduced to seven (7) days, calculated from the last day of the month to which the claim applies; and

(ii) the 28-day period allowed to the Employer's Agent in terms of Subclause 10.1.5 of the Conditions of Contract in which to give his ruling on the claim, shall be reduced to fourteen (14) days.

The Contractor's monthly claim shall be accompanied by a copy of the signed daily rainfall readings for the applicable month.

(e) The extent of any extension of time which may be granted to the Contractor in respect of wet climatic conditions (whether normal or abnormal) shall be determined as the algebraic sum of the "V" values for each month between the Commencement Date and the Due Completion Date of the Contract, calculated in accordance with subclause 4(a) above;
provided always that

(i) rainfall occurring within the period of the Contractor's Christmas shut-down period (referred to in Subclause 1.6 of the Conditions of Contract) shall not be taken into account in the calculation of the monthly "V" values;

(ii) rainfall occurring during any period during which the Contractor was delayed due to reasons other than wet climatic conditions on the Site, and for which delay an extension of time is granted by the Employer's Agent, shall not be taken into account in the calculation of the monthly "V" values;

(iii) if the algebraic sum of the "V" values for each month is negative, the time for completion will not be reduced on account of subnormal rainfall, and

(iv) where rainfall is recorded only for part of a month, the "V" value shall be calculated for that part of the month using pro rata values for Nn and Rn.

(f) The Employer's Agent shall, simultaneous with granting any extension of time in terms of this clause, revise the Due Completion Date of the Contract to reflect an extension of time having been granted in respect of wet climatic conditions, to the extent of the algebraic sum of all the "V" values for all the preceding months of the Contract , less the aggregate of the "Nn" values for the remaining (unexpired) months of the Contract (viz less aggregate of the potential maximum negative "V" values for the remaining Contract Period). Thus, provided that where such period is negative, the Due Completion Date shall not be revised.

(g) Any extension of time in respect of wet climatic conditions granted in terms of this clause shall not be deemed to take into account delays experienced by the Contractor in repairing or reinstating damage to or physical loss of the Works arising from the occurrence of abnormal climatic conditions. Extension of time in respect of any such repairs or reinstatement regarding damage shall be the subject of a separate application for extension of time in accordance with the provisions of Clause 5.12 and Clause 10.1 of the Conditions of Contract.

ALTERNATIVE 2 (Critical path method)

(a) A claim for extension of time in respect of delays suffered by the Contractor in consequence of wet climatic conditions will be considered by the Employer's Agent in terms of Clause 5.12 of the Conditions of Contract and in accordance with provisions set out hereunder.

(b) For the purposes of extension of time, a delay caused by wet climatic conditions will be regarded as a delay only if, in the opinion of the Employer's Agent, all progress on an item or items of work on the critical path of the Contractor's working programme as approved in terms of Clause 5.6 of the Conditions of Contract has been brought to a halt.

(c) Unless it is customary to carry out the work, in respect of which a delay was suffered, by rotary shifts or by day and by night, only delays to critical path items experienced as a result of wet climatic conditions during normal working hours (as defined in Clause 5.8 of the Conditions of Contract) will be taken into account for extension of time. This will apply notwithstanding the fact that a delay may have occurred on a portion of the Works on the critical path due to wet climatic conditions, which work was being executed outside the said normal hours with the permission of the Employer's Agent, granted in terms of Subclause 5.8.1.1 of the Conditions of Contract.

RAINFALL TABLE

(d) The Contractor shall make due allowance within his programme submitted in terms of Clause 5.6 of the Conditions of Contract, for a total anticipated delay to items on the critical path resulting from wet climatic conditions, of Fifteen (15) normal working days (as defined in Clause 5.8 of the Conditions of Contract) during the Contract.

(e) Extension of time, if granted by the Employer's Agent, will be determined as the aggregate number of normal working hours for which all progress on the item or items on the critical path was brought to a halt as a result of wet climatic conditions, less the number of normal working days specified in subclause (d) above.

(b) In determining the revised Due Completion Date of the Contract , the Employer's Agent shall add the equivalent number of normal working days delay determined in accordance with subclause (e) and all intervening normal non-working days to the prevailing Due Completion Date.

5. Community participation

Community participation consists of engagement of Project Steering Committees (PSC). A PSC will be established for the town by the Ward Councilor. The functions of the PSC will be to:

- Assist in monitoring the project.
- Ensure that the community provide assistance to the Contractor to ensure that he can execute the Contract in accordance with the specifications and within time.
- Encourage the community to participate in the Labour-Intensive construction.
- Identify skills, skilled personnel and suppliers in the towns.

The PSC will not have the power to:

- Give any instructions to the Contractor, except through the Employer's Agent.
- Become involved in the daily operations of the Contractor or interfere with the Contract works.

A monthly meeting will be held with the PSC to discuss relevant matters. The site agent and resident Employer's Agent will attend the meetings. The Contractor will have to report on progress, deviations from the programme, financial matters community related aspects, general problems and co-operation at the meeting. The PSC members will not receive any remuneration for attending, and they must provide their own transport.

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

C3.6 PARTICULAR SPECIFICATIONS AND VARIATIONS AND ADDITIONS TO THE STANDARD SPECIFICATIONS

C3.6.1 VARIATIONS AND ADDITIONS TO THE STANDARD SPECIFICATIONS

PSA GENERAL (SANS 1200 A)

Interpretations

Definitions

(a) General

Add the following definitions: -

“General Conditions: The General Conditions of Contract specified for use with this Contract and the Special Conditions of Contract as applicable.

Specified: As specified in the Standardised Specifications, the Drawings or the Project Specifications. Specifications shall have the corresponding meaning, as provided for in sub-clause 1(1)(u) of the General Conditions of Contract”.

Measurement and Payment

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

“Fixed Charge: A charge that is not subject to adjustment on account of variation in the value of the Contract amount or the Contract time for completion.

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

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

PSA 1 MATERIAL (Subclause 3.1)

PSA 1.1 QUALITY

Substitute the second sentence of the first paragraph of A 3.1 with the following:

Materials shall bear the official mark of the appropriate standard.

Substitute the second paragraph with the following:

The Contractor is responsible for the cost of all testing to ascertain that the materials do comply with the relevant minimum requirements and all such costs shall be deemed to be included in the tendered rates. The cost of control tests done by the Employer’s Agent and of which the results do not comply with the minimum requirements shall be for the Contractor's account. The Contractor shall inform the Employer’s Agent of any control testing to be done at least 48 hours before such tests are required and must allow in his program for the time necessary for the tests and the processing of the results thereof. The handling, storage, transport, and erection of equipment, machinery, and materials shall be strictly in accordance with the requirements of the supplier and/or manufacturer.

All materials shall be new and of the best quality available unless otherwise specified. They must function satisfactorily under prevailing climate and weather conditions at the place of installations

PSA 2 PLANT

PSA 2.1 CONTRACTOR'S OFFICES, STORES AND SERVICES (Subclause 4.2)
Add the following to this subclause:

PSA 2.1.1 Storage

The Contractor shall supply sufficient protection for perishable materials to the satisfaction of the Employer's Agent, and all materials shall be used in the order in which it was delivered. Cement older than three months shall be removed from the site and shall not be used in the Works.

PSA 2.1.2 RESTRICTIONS ON EMPLOYEE ACCOMMODATION

No housing is available for the Contractor's employees, and the Contractor shall make his own arrangements to house his employees and transport them to site.

The Employer will place at the disposal of the Contractor an area to enable him to erect his site offices, workshops, stores, and any temporary housing the Contractor may wish to erect for his personnel. The temporary housing and ablution facilities shall comply with the requirements of the local Authority.

PSA 2.2 CAPACITY OF PLANT AND EQUIPMENT (Clause 4)

Add as Clause 4.3:

The Contractor shall supply plant and equipment in sound working condition and of adequate capacity to complete the Works well within the period or periods specified or stated in the appendix to the tender.

In addition, he shall have available on the Site adequate standby plant to ensure that operations designed to be executed continuously are not disrupted because of breakdown of any plant provided for such operations.

PSA 3 CONSTRUCTION

PSA 3.1 DETAILED SETTING OUT (Subclause 5.1.1)

The Contractor shall be solely responsible for the execution of the works to the correct line and level.

The Contractor shall carefully set out the works, employing a capable surveyor to the lines and levels gleaned from information provided.

The proposed network pipes must be placed 2,0m away from the erf boundaries in the road reserve The tolerance allowed in setting out shall be 10mm either way.

Work set out by the Contractor shall be checked by the Employer's Agent whereafter any errors be rectified by the Contractor.

The Contractor shall provide at least three days' notice of such a check to the Employer's Agent. The Contractor shall supply any material and labour required for the control survey work by the Employer's Agent including the supply of and placing the necessary pegs, sight rails, etc.

Any discrepancy shall immediately be reported in writing to the Employer's Agent. Any costs or subsequent costs arising from discrepancies, which had not been reported to the Employer's Agent, shall be the sole responsibility of the Contractor.

Any assistance, including checking, rendered to the Contractor by the Employer's Agent shall not be held as relieving the Contractor of his responsibility in this respect. Should any portion of these works be constructed incorrectly, the Contractor shall at his own expense rectify the work to the satisfaction of the Employer's Agent.

The Contractor shall be held solely responsible for the protection of all bench marks, reference pegs and level pegs.

The Contractor shall establish at least three benchmarks at selected points.

PSA 3.2 WATCHING, BARRICADING, LIGHTING AND TRAFFIC CROSSINGS (Subclause 5.2)

Add the following to this subclause:

The Contractor shall ensure that he complies with all the requirements of the authorities concerned with respect to the safety of the works and labourers, including the provision and wearing of protective clothing. Any negligence or non-compliance of any of these requirements shall be viewed in a serious light and shall be sufficient reason for the Employer's Agent to order the immediate suspension of the total extent of the Works.

The Contractor shall provide for artificial lighting for any part of the Works that may be required for the proper execution of the work.

The crossing of existing tar and dirt roads must be done in half widths, while the total traffic is accommodated on 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 Employer's Agent before construction commences.

PSA 3.3 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES (Subclause 5.4)

Add the following to the subclause:

Before commencing any excavation, the Contractor shall verify the position of all known or suspected obstacles by inspection of the site, examination of drawings or, where necessary by the excavation of trial holes. Any damage caused to existing services and works shall be repaired as expeditiously as possible by the Contractor at his own expense and shall be reported immediately to the Employer's Agent.

Where permanent protective works are ordered by the Employer's Agent, such works shall be valued as a variation. The Employer's Agent will supply the Contractor with such information as may be available concerning obstructions and services, but whilst such information is given in good faith, it shall not relieve the Contractor of any of his liabilities, obligations and risks under the Contract.

The Contractor shall be responsible for any damage to such public services and existing works in the execution of this Contract and shall reimburse the Public Authority or the Owner concerned for any repairs required or compensation for damage awarded.
Any alteration to public services shall be carried out by the Authority concerned.

The Contractor shall provide the necessary assistance during any operations necessary in connection with the removal, alteration or safeguarding of any public service.

The relevant authority and Employer's Agent shall be informed of any damages without delay.

PSA 3.4 DEALING WITH WATER ON WORKS (Subclause 5.5)

Add the following to the subclause:

The Contractor shall be responsible for the dewatering of excavations and the full and adequate protection of the works against damage by storm or water from any source whatever. He shall construct all necessary diversion works and drains to deal adequately with and bypass all water and carry out any necessary pumping of water and supply all tarpaulins or other covers which may be required to protect any section of the work during heavy rain or storm together with any other labour work and material which, in the opinion of the Employer's Agent is necessary to keep the work dry and safe at all times.

Full risk and cost of dealing with water shall be borne by the Contractor.

PSA 3.5 POLLUTION (Subclause 5.6)

Add the following to the subclause:

The Contractor shall maintain all access roads and the area where the offices, stores and workshops are situated to the satisfaction of the Employer's Agent. It shall be kept damp to limit dust and inconvenience or disturbance to the residents in the neighbourhood of the Works to a minimum.

PSA 3.6 DEGREE OF ACCURACY (Subclause 6.2)

Delete this subclause and replace with the following:

The Contractor shall construct each of the various parts of the Works to the degree of accuracy specified in the relevant standardized specification.

PSA 4 TESTING

PSA 4.1 APPROVED LABORATORIES (Subclause 7.2)

Add the following to this subclause:

No laboratory facilities are required on site. The Contractor shall use an independent laboratory for the necessary tests. Unless otherwise stated in the Bill of Quantities, the cost of all tests shall be for the account of the Contractor and no additional payment will be made for them.

PSA 5 MEASUREMENT AND PAYMENT (Clause 8)

PS A 5.1 Fixed-Charge and Value-Related Items

PSA5.1.1 Contractual Requirements..... Unit: Sum

The sum shall cover the Contractor's initial costs of providing sureties, insurance of the works and plant, third party or public liability insurance and unemployment insurance to cover his compliance with the requirements of the Workmen's Compensation Act, 1941 (Act NO. 30 of 1941) and any other initial

financing obligations of a preliminary and general nature, such as contributions to the CEITB. 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.

PS A 5.1.2 Establishment of Facilities on the Site

PS A 5.1.2.1 Facilities for Engineer

a) Furnished office (No) …….....Unit: Sum
b) Carport……..……..…….....Unit: Sum
c) Name-board (No.) ……..……..…….....Unit: Sum
d) Telephone……Unit Sum
e) Survey Assistant……Unit Sum
f) Survey Equipment…….....Unit Sum

PS A 5.1.2.2 Facilities for the Contractor

a) Offices and storage sheds …… …… Unit: Sum
b) Workshops ……..…..... Unit: Sum
c) Laboratories ……..…….Unit: Sum
d) Living accommodation ……..…… ….Unit: Sum
e) Ablution and latrine facilities ……..… .. ..Unit: Sum
f) Tools and equipment ……..…… .. ..Unit: Sum
g) Water supplies, electric power and communications …….…....Unit: Sum
h) Dealing with water ……..….. Unit: Sum
i) Access …… ……..... Unit: Sum

PSA 5.1.3 Other Fixed-Charge Obligations..... Unit: Sum

This item as listed under Schedule A of the bill of quantities is as specified in the standardised specification SANS 1200 A.

PSA 5.1.4 Removal of Site Establishment..... Unit: Sum

The sum shall cover the cost of the demolition on and the removal from the surface of the site of all items established in terms of 8.3.2 and 8.3.3, and shall provide for the making good and the restoring of the Site to the satisfaction of the Engineer

PS A 5.2 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 with cost 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.

PS A 5.2.2 SCHEDULED TIME RELATED ITEMS

PS A 5.2.2.1 Facilities for Engineer

a) Furnished office (No) ……..…….....Unit: Sum

b) Carport……..……..……..... Unit: Sum

c) Name-board (No.) ……..……..…….....Unit: Sum

d) Telephone…….Unit Sum

e) Survey Assistant…….……Unit Sum

f) Survey Equipment…….....Unit Sum

PSA 5.2.2.2 Facilities for Contractor ..... Unit: Sum

The sum shall cover the Contractor's time related costs of providing sureties, insurance of the works and plant, third party or public liability insurance and unemployment insurance to cover his compliance with the requirements of the Workmen's Compensation Act, 1941 (Act NO. 30 of 1941) and any other initial financing obligations of a preliminary and general nature, such as contributions to the CEITB. Establishment of Facilities on the Site Facilities for Engineer

PS A 5.2.2.2 Facilities for Contractor

a) Offices and storage sheds…….. ……..Unit: Month

b) Workshops …..……..…. Unit: Month

c) Laboratories …..…….…. Unit: Month

d) Living accommodation ……..…….…. Unit: Month

e) Ablution and latrine facilities ……. ….…Unit: Month

f) Tools and equipment ……..……Unit: Month

g) Water supplies, electric power and communications …..…….. Unit: Month

h) Dealing with water …….. Unit: Month

i) Access …….…….. . Unit: Month

PSA 5.2.3 Supervision for Duration of Construction..... Unit: Sum

The sum shall cover the costs of on-site supervision and such local administration as the Contractor considers necessary for the proper completion of the Works, and shall cover the cost of the salaries, wages and allowances paid to the site agent, general foreman, section foremen (where applicable), site surveyors, timekeepers, assistants and other site supervisory staff, and of transport incurred in connection with such staff. Plant (designated plant or plant for designated operations or plant for use during Supervision for Duration of Construction).

PSA 5.2.4 Company and Head Office Overhead Costs for the Duration of the Contract...Unit: Sum

The sum shall cover the Contractor's company and head office overhead costs.

PS A 5.3 SUMS STATED PROVISIONALLY BY ENGINEER

PS A 5.3.1 Community Liaison Officer ……Unit: P/Sum

The Contractor must pay a salary to a person appointed as the Community Liaison Officer for the project. The amount of payment and payment dates will be determined as soon as the Community Liaison Officer is appointed.

PSA 5.3.2 PSC Meetings Attendance Unit: P/Sum

The tendered rate shall cover the compensation of all members of Project Steering Committee for attending meetings. The amount of payment and payment dates will be determined on the commencement date of the project. The Employer's Agent should authorise payment before it is made. Proof of payment has to be submitted to Employer's Agent before claim can be certified.

PS A 5.3.3 Overheads, charges and profit on (1) above Unit: %

Handling cost and profit in respect of sub-item 5.3.1&2. A percentage of the payment made to the Community Liaison Officer and PSC Meeting attendance will be paid to the Contractor. The rate shall cover the Contractor's overheads, charges, and profit on payments for the Community Liaison Officer and PSC members. No payment will be made under this item before payment to the Community Liaison Officer and PSC members.

PS A 5.3.4 Training Unit: P/Sum

Provisional sum for training services supplied by the Training Company. The name and contact details of the Training Company, to be appointed by the Contractor, will be supplied to the Contractor by the Employer or Employer's Agent.

i. Generic kills……..Unit:P/Sum

ii. Entreprenaural skills……. Unit:P/Sum

PS A 5.3.5 Overheads, charges and profit on (1) above Unit: %

Handling cost and profit in respect of sub-item 8.5(b)1. A percentage of the payment made to the Training Company will be paid to the Contractor. The rate shall cover the Contractor's overheads, changes, and profit on payments for the Training Company. No payment will be made under this item before any payment is made to the Training Company.

PS A B.5.3.6 Occupational, Health and Safety Act.....Unit: Sum

Handling cost in respect of sub-item 8.3.5. A percentage of the payment made to the Occupational health and safety act will be paid to the Contractor under this section. The rate shall cover the Contractor's overheads, changes, and profit on payments for the Occupational health and safety act.

1.Provision for safety officer

The Contractor should appoint the safety officer who will be full time responsible for all safety issues on site, and he or she should be full time on site.

The tendered rates include the full compensation for that part of the provision of safety officer in terms of the Occupational Health and Safety Act and the construction regulation which are mainly a function of time. Payment shall be made monthly.

Handling cost in respect of sub-item 8.3.5.2 (a). A percentage of the payment made to the Safety Officer will be paid to the Contractor. The rate shall cover the Contractor's overheads, changes, and profit on payments for the Safety Officer.

PS A B.5.3.7 Contractor's time related obligation in respect of the OH&S Act and

Construction regulation

The tendered lump sum shall represent full compensation for that part of the Contractor's general obligations in terms of Occupational Health and Safety Act and the Construction Regulations which are mainly a function of time. The lump sum will be paid monthly only after payment for item 1.3.3 and item 1.1.5 has been made Payment of the lump sum shall be made monthly (calculated by the division of the lump sum by the number of months remaining).

PSAB : EMPLOYER'S AGENT OFFICE

PSAB 1 MATERIALS

PSAB 1.1 NAMEBOARDS (Subclause 3.1)

Add the following to the subclause:

Notwithstanding the provisions of Subclause 3.1 of SANS 1200 AB, the standard nameboards complying with the recommendations of the South African Association of Consulting Engineers shall be provided. Details of the nameboard will be available from the Engineers.

PSAB 1.2 OFFICE BUILDINGS (Subclause 3.2)

Delete this subclause and replace with the following:

The Contractor shall provide the following furnished offices for the use of the Engineer and the Client. Each office shall consist of one room with the following floor area:

i) Engineers' office: 18 m^2

The clear height of all offices between floor and ceiling shall be 2,5m minimum. All windows shall be of the type than can be open over the full window area.

Each office shall be weatherproof, shall have a concrete floor and shall be provided with a ceiling and a lining to the walls, or equivalent insulation, with an acceptable type of door with a secure lock, and two opening windows of glazed area at least 3m2. Each office shall be well ventilated and shall be so insulated as to provide comfortable working conditions.

The internal furnishings of each office shall include:

a) one trestle table, 2m long x 1m wide x 0,9m high, with a smooth top;

b) one table or desk having a top of size at least 1,5m x 0,9m and at least one lockable drawer;

c)one high stool;

d) two chairs;

e) a lockable upright steel cabinet with three shelves or a steel filing cabinet with four drawers;

f) shelving of total length 3m and of nominal width 300mm;

g) an acceptable blind on each window,

h) a wash-hand basin;

i) acceptable lighting;

j) provision for heating in winter and cooling in summer;

k)one conference type steel table with folding legs of size at least 4,0m x 0,9m.

The Contractor shall also supply a toilet for the exclusive use of the Engineer.

PSAB 1.2 CAR PORTS (New Subclause 3.2 (k))

The Contractor shall provide two permanent car ports for the use of the Engineer. The car ports shall be so constructed that the vehicles parked under them will at all times be shaded from direct sunlight. The car ports shall be at least 20m^2 in area and shall have a hard stand of crushed stone.

PSAB 2 CONSTRUCTION

PSAB 2.1 SURVEY EQUIPMENT (Subclause 5.5)

Add the following:

The Contractor shall provide the following survey equipment on the site from the commencement to the completion of the Works:

1. 1x Tachometer capable of reading 20 seconds of arc (Total Station);
2. 1x Employer's Agent's level and level staff;
3. 2x Tachometer staffs graduated metrically (Total Station;
4. 1x Steel tape of length 30m.

The tachometer may be shared by arrangement between the Contractor and the Employer's Agent's Representative, but the remaining instruments shall be provided for the exclusive use of the Employer's Agent's Representative. The Contractor shall keep the equipment continuously insured against any loss, damage, or breakage and he shall indemnify the Engineer and the Employer against any claims in this regard. Upon completion of the whole of the Works, the ownership of the equipment shall revert to the Contractor.

The Contractor shall maintain the equipment in good working order and keep it clean throughout the Contract period.

PSAB 2.2 CELLULAR PHONE (New Subclause 4.2)

The Contractor shall supply the Engineer with a cellular phone for the Employer's Agent's sole use. The Contractor shall be responsible for the supply, maintenance, payment of accounts, etc. of the cellular phone. Ownership of the equipment shall be given to the engineer at the end of the Contract.

PSAB 2.3 MEASUREMENT AND PAYMENT OF SURVEY EQUIPMENT

Provide and maintain survey equipment SUM

The rate shall cover the charges for the provision, insurance and maintenance of the equipment.

PSAB 3 SURVEY ASSISTANTS (Subclause 5.5)

Add the following:

The Contractor shall make available to the Engineer two suitably trained survey assistants for use on and about the SITE at all reasonable times for the duration of the Contract.

PSC: SITE CLEARANCE

PSC 1 MATERIALS (Clause 3)

PSC 1.1 DISPOSAL OF MATERIAL (Subclause 3.1)
Add to this sub-clause:
Material obtained from clearing and grubbing and from the demolition of structures shall be disposed of in a borrow pit indicated by the Engineer and shall be finished to the satisfaction of the Engineer.

PSC 2 CONSTRUCTION (Clause 5)
PSC 2.1 INDIVIDUAL TREES (Subclause 5.2.3.2)
Add to this sub-clause:
Should the Contractor remove or damage any tree marked to be preserved, a penalty of R1000,00 per tree shall be payable.
PSC 2.3 EXISTING FENCING
The fencing parallel to the pipeline routes must only be removed and re-erected at the positions as indicated and approved by the Employer's Agent and repaired where it was damaged. When the pipeline routes cross fencing or gates temporary wire gates must be provided that must be kept closed. After completion of the work these fences or gates must be repaired to the same condition as before commencement of the work.

PS C 3 MEASUREMENTS AND PAYMENT

PS C 3.1 SCHEDULED ITEMS

PS C 3.1.1 Clear and grub (0.8m wide) Unit: m

The removal of all rocks and boulders on site over 0,15m^3 will be paid under sub-clause PS DB 8.3.2(b). The removal of hard rock other than boulders will be paid under sub clause PS DB 8.3.2(b).

PSC 3.1.2 Remove and grub large trees and tree stumps of girth

a) over 1 m and up to and including 2 m ..... Unit: No
b) over 2 m and up to and including 3 m ..... Unit: No

The girth of a tree or stump will be measured at the narrowest point of the tree or stump in the first metre of its height above ground level. Trees and stumps of girth exceeding 1 m will be measured individually and classified according to site in increments of 1 m as indicated above.

The rate shall cover the cost of clearing and grubbing trees and stumps of all sizes, cutting branches, backfilling holes, and removing, transporting, and disposing of all such trees, stumps, and branches and associated material.

PSC 3.1.3 Remove and grub all trees and tree stumps regardless of girth ……. Unit: No

In exceptional circumstances, where construction is carried out through plantations or where the quantity of trees or girth exceeding 1 m renders individual measurement impracticable the project specification may provide that the clearing and grubbing of trees be measured in hectares. If this method of measurement is used the areas to which it is applicable will be defined clearly on the drawings and the reason for adopting the method of measurement will be stated in the project specification. The rate shall cover the cost of all operations specified.

PSC 3.1.4 Take down existing fence……..…….… Unit: m

The rate shall cover the cost of taking down the fences, coiling wire, sorting and stacking all material at sites indicated by the Engineer and the cost of loading, transporting and offloading such material.

PSDB: EARTHWORKS (Pipe Trenches)
This specification covers earthworks for trenches for all types and sizes of pipes. It covers excavation, the preparation of a trench bottom, backfilling and the reinstatement of surfaces.

PSDB 1 MATERIALS (Subclause 3)
PSDB 1.1 CLASSIFICATION OF EXCAVATED MATERIAL (Subclause 3.1)
Delete this subclause and replace with the following:
Distinction shall be drawn, for payment purposes, between excavation in hard and soft material. All excavation for pipe trenches shall be classified in accordance with the following classification.

PSDB 1.1.1 Soft excavation
Soft excavation shall be excavation in all existing fill material as well as excavation in material which can be efficiently removed by any of the following plant.
A bulldozer having a mass, including the mass of the ripper if fitted of 35 ton and having a flywheel power of approximately 220 kW or a back tractor having 0,15 kW per millimetre bucket width.

PSDB 1.1.2 Hard excavation
Hard excavation shall be excavation in material which cannot be efficiently ripped by plant as described in PSDB 1.1.1. This excavation generally includes material such as formation of weathered rock which can only be removed after blasting or boulders of 0,5 m^3 or larger in volume.
The Contractor shall be at liberty to use any method he wishes to excavate any class of material, but the method of excavation shall, however, not dictate the classification of the excavation.
The Engineer shall decide under which one of the above classes any excavation shall be classified and paid for. In the first instance the classification shall be based on inspection of the material to be excavated and the method of excavation proposed by the Contractor. In the event of disagreement between the Contractor and the Engineer, the Contractor shall, if required, make available such mechanical equipment as specified in order to test the reasonable removability or otherwise of the material. The decision of the Engineer as to the classification shall thereafter be final and binding.
The Contractor shall immediately inform the Engineer as and when the nature of the material being excavated changes to the extent that a new classification for further excavation is warranted. Failure on the part of the Contractor to timeously advise the Engineer shall entitle the Engineer to classify, in his sole discretion, such excavation as may have been executed in material of a different nature.

PSDB 1.2 FREEHAUL (Subclause 5.6.8)
Delete this subclause and replace with the following:
The free haul distance within which the Contractor will be required to move material without separate compensation shall be 2,0km. Overhaul will be paid for the moving of material beyond that distance.

PS DB 2 PLANT (Subclause 4.1)
PS DB 2.1 EXCAVATION EQUIPMENT
Add the following to DB 4.1:
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 3 CONSTRUCTION (Clause 5)
PSDB 3.1 PRECAUTIONS
PS DB 3.1.1 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.

PS DB 3.2 EXCAVATION

Add the following to DB 5.4:

"Excavation and backfilling of pipe trenches on sidewalks in the residential area shall be done in such a 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.

PS DB 3.3 TRENCH BOTTOM

Substitute "90 %" in the second paragraph of DB 5.5 with "93 % ".

PS DB 3.3.1 Over Excavation of Trenches

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. Over excavation shall be on the Contractor's account.

PS DB 3.4 BACKFILLING

PS DB 3.4.1 General

Backfilling in road reserves must be compacted in 150mm 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.

PS DB 3.4.2 Disposal of Soft Excavation Material

Add the following to DB 5.6.3:

All surplus and unsuitable material as described in DB 5.6.3 shall be disposed of at the spoil site, (as described in PS D 5.2.2.3) and levelled.

PS DB 3.5 COMPACTION

PS DB 3.5.1 Areas Subject to Traffic Loads

Add the following to DB 5.7.2:

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 in layers of 150mm as follows:

Item	% mod AASHTO	Final Layer Thickness
Approved Backfill	93%	150mm
Main Backfill up to road layers	96%	150mm

Sub-base	97%	150mm
Base	98%	150mm

PS DB 3.6 REINSTATEMENT OF SURFACE

PS DB 3.6.1 Private Property and Commonage

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.

PSDB 4 MEASUREMENT AND PAYMENT (Subclause 8)

PSDB 4.1 BASIC PRINCIPLES (Subclause 8.1.1)

Change the following in this subclause:
The free haul distance will be 2,0km and not 0,5km.

PSDB 4.2 CALCULATION OF QUANTITIES (Subclause 8.2.3)

Change the first sentence of the subclause to read as follows:
Where volumetrically measurement is necessary, the volume will be computed from the difference in level between natural ground level and 100mm below pipe invert level as shown on the drawings.

PS DB 4.2.1 Shoring

Add the following to DB 8.2.4:
Shoring will only be measured and paid for, if the Engineer gives written approval before it is installed.

PSDB 4.2.2 Excavation

(a) Excavation in all material for trenches, backfill, compact and dispose of surplus material…… Unit (m)

Item will be provided for various pipe diameters in steps not greater than those specified in 5.2 and various depths in increments of 1.0 m measured to the bottom of the bedding layer (see attached drawings). Where measured volumetrically in terms of 8.1.2 (a), the volume of excavation will be computed in accordance with 8.2.2 and 8.2.3
The rate shall cover the cost of the same operation in heading where the Contractor elects to use such a method of excavation. The volume or length will be measured for payment on the assumption that normal trench excavation has been carried out. The volume or length in the undisturbed prism of material between the top of the tunnel and ground level will be classified as soft excavation in terms of 3.1. No additional payment will be made for such headings and no deductions will be made for reduced excavation quantities.

(b) Extra-over item (a) above for:

1. Intermediate excavation …… Unit: m³
2. Hard rock excavation……..…… Unit: m³
3. Hand excavation and backfill where ordered by the engineer…… Unit: m³
4. Soil Crete backfilling were directed by the engineer. ……..…… Unit: m³

Separate items will not be provided for depth increment, volume will be computed from the trench width determined in accordance with 8.2.3 and the depth from the top of the intermediate or hard rock excavation, as the case may be, either to the bottom of the same material or to the bottom of the trench as specified in (a) above, whichever is the lesser (see Drawing DB 5
The rates shall cover the additional cost of the excavation and hauling of the more difficult material of unsuitable material. The Contractor must obtain written approval for all stages on item (b) (a) 1 to 4.

(c) Excavate and dispose of unsuitable material from trench bottom (provisional… Unit: m³

The volume will be computed from the trench width determined in accordance with 8.2.3 and m³ the additional depth ordered.
The rate shall cover the cost of the excavation of the additional depth in any material, the disposal of the unsuitable material as specified for soft: excavation in 5.6.3 within free haul distance and the backfilling of the additional depth with suitable material from the side of the trench.

PSDB 4.2.3 EXCAVATION ANCILLARIES

PSDB 4.2.3.1 Make up deficiency in backfill material

a) from other necessary excavations on site ……Unit: m³

b) by importation from-designated borrow pits …… Unit: m³

c) by importation from commercial or off-site sources selected by the Contractor .... Unit: m³

Items (b) and (c) above will not be measured for payment unless importation has been ordered in writing. The volume will be computed from the trench width determined in accordance with 8.2.3 and the depth from the top of the backfill to the top of the bedding as shown on Drawing DB-1 or the actual depth of backfill used to make up the deficiency or the depth of additional excavation ordered in terms of B.3.2(c), as applicable.
The rate for material from other necessary excavations on site shall cover the cost of selection of suitable material, the moving of the material to points alongside the trench spaced to suit the Contractor's method of working, and the disposal of the material that is replaced, all within free-haul distance.
The rate for material from designated borrow pits shall cover the cost of royalties, if applicable, excavation and selection of suitable material, the moving of the material to points alongside the trench spaced to suit the Contractor's methods of working, and the disposal of the material that becomes surplus as a result of the importation, all within free-haul distance.
The rate for material from commercial or off-site sources selected by the Contractor shall cover the cost of the acquisition of the material (including royalties, if applicable), the moving of the material to points alongside the trench spaced to suit the Contractor's methods of working, and the disposal of the material that becomes surplus as a result of the importation, all within free-haul distance (see Subclause 5.2.5.1 of SANS 1200 D or Subclause 5.2.6.1 of SANS 1200 DA, as applicable).

PS DB 4.2.3.2 Opening up and closing down of designated borrow pit .....Unit: Sum

This item will only be scheduled when a new borrow pit has to be established or when access to an existing borrow pit has to be established.
With the exception of the cost of the removal and spreading back of the topsoil (if scheduled), the sum shall cover the cost of opening up and of restoring the Site as specified in Subclause 5.2.2.2 of SANS 1200 D or Subclause 5.2.2(f) of SANS 1200 DA, as applicable.

PS DB 4.2.5 Existing Services

Existing Services-that Intersect or Adjoin a Pipe Trench (see Sub-clauses 5.1.2 and 8.3.8 of SANS 1200 D or Sub-clauses 5.1.3 and 8.3.5 of SANS 1200 DA, as applicable.) (See Subclauses 5.1.2 as applicable.)

(i) Services that intersect a trench (angles between centre-lines in plan of 4590°)..unit (No)

Except where water pipes are to be recovered, existing water pipes, sewers, stormwater pipes, concrete-lined channels and drains, box culverts, electric cables, ducts, kerbs, channels, erf connections and various sizes of pipes and services that intersect a trench of specified width and require various degrees of care, whether or not their presence is known before they are uncovered, will be measured separately. The unit refers to one service, but services that are so grouped that they can be contained within a horizontal dimension of 200 mm measured at right angles to the axis of the services will be measured as one unit.

(b) Services that adjoin a trench (parallel to or at an angle between centre-lines in plan of less than 45 degrees) ..... Unit No)

In a case where a trench of specified width
1 runs parallel to or at an angle (in plan) of less than 45O to an existing service, and is such that the nearer side of the bottom of the trench lies at least partly between a vertical plane and a plane that lies at an angle of 45O below the horizontal, both planes passing through the axis of the service, the length of

service within the minimum base width of the trench, determined in accordance with 5.2, will be measured for payment under this item and the remaining length, the side of the trench which, in the opinion of the Engineer, is rendered liable to collapse because of the existence of such service, will be measured for shoring (see 8.3.4(a)).
The rate for an item scheduled in terms of (a) and (b) above shall cover the additional cost of

i) care in excavation necessitated by the presence of such service in or across the trench;

ii) protecting and maintaining such service in operation by mans of temporary supports or shoring, as necessary;

iii) delays and disruption of the progress of the work due to the existence of the service1 and

iv) repairs necessitated by damage caused by the Contractor.

PS DB 4.2.6 Finishing

PS DB 4.2.6.1 Reinstate road surfaces complete with all courses Unit: m2

Replace DB 8.3.6.1 with the following:

a) Gravel…… Unit: m2

The area will be calculated from the length of finished road or paved surfaces as applicable and with the trench width taken as 0,8m. Payment for finishing will be additional to that for excavation covered by 8.3.2.
The rate shall cover the cost, selective excavation (including the equipment that is required to break up, remove and, if necessary, stockpile the original surface material), and subsequently of reinstating and 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 PS DB 5.7.2

PSL MEDIUM PRESSURE PIPELINES

This specification covers the supply and installation of pipelines of diameter up to 1 000 mm, complete with ancillary works, for transporting water and sewage under working pressures of up to 2.5 MPa.

PSL 1 MATERIALS

PSL 1.1 GENERAL

Replace the first sentence of L 3.1 with the following:
PVC-O pipes, where relevant, will be used in the water pipelines.

Pipes and fittings shall be of the types specified in the schedule or in the project specification and, unless otherwise required in terms of the project specification, they and their couplings shall be capable of withstanding the applicable test pressure specified in 7.3.1. All pipes and fittings shall be supplied complete with couplings and jointing material.

Satisfactory temporary end covers shall be provided for the protection of threads, flanges, and prepared ends of plain-ended pipes and fittings, and to prevent damage to internal lining during transportation and during handling on Site.

Pipeline materials shall be so transported, stored, and handled that pipe are not overstressed at any time and fittings are not damaged in any way. PVC-O pipes to be stored under shade for the period between delivery to site and pipe laying and backfilling. All thin-walled, flexible, and soft-coated pipes shall be handled with particular care and shall be so stored that they are not subject to concentrated pressure from stones or other objects. Pipes damaged or cracked in any way shall be removed from the Site.

PS L 1.2 STEEL PIPES, FITTINGS AND SPECIALS

PS L 1.2.3 Pipes of Nominal Bore over 150mm

ADD THE FOLLOWING PARAGRAPHS:

“All mild steel pipes and fittings other than screwed and socketed pipes, shall comply with the requirements of SANS 719 grade A. Specials shall be manufactured from straight pipes in accordance with the relevant requirements of BS534. All welding in pipes and specials shall be electric fusion welding.

Before leaving the factory, all mild steel pipes and fittings shall be protected against corrosion in accordance with the relevant Particular Specification.

Plain ends of pipes and fittings shall be covered and protected against damage while being transported from the factory to the Site.

The Contractor is responsible for preparing detailed dimensioned pipe schedules for the approval of the Engineer prior to the start of fabrication of the pipes, fittings and specials.

The Engineer will supply a general arrangement drawing of each pipeline showing its start and end points as well as its horizontal and vertical alignment together with positions of valves and other specials

The Contractor will be responsible for detailing each individual pipe and pipe special. Site welding shall not be permitted due to its deleterious effect on linings and coatings. All pipes and specials shall be eminently suitable for receiving internal linings as specified.

Welding and visual examination of mild steel piping shall be carried out in accordance with BS 4871 Part 1, BS 2633 or BS 2571 as appropriate. Dye penetration examination shall be undertaken on not less than 10 % of all welds.

PS L 1.2.4 Fittings and Specials

ADD THE FOLLOWING TO THIS SUB-CLAUSE:

"All pipe specials shall be accurately made to the sizes and dimensions specified or given on the drawings and/or Schedule.

Unless otherwise specified, segmented steel bends shall be made with a radius equal to 2.0 times the pipe diameter. If details of segmented bends are not provided, the bends shall have one mitre weld each, up to and including a deflection angle of 22.5° and two mitre welds each up to and including 45°, and three mitre welds each up to and including 90°.

All other fittings and specials (excluding pipe bends) to be in accordance with SANS 719 unless otherwise indicated on the drawing.

The vertical axis of all fabricated steel items shall be accurately identified by using paint marks on the pipe ends."

PS L 1.2.5 Welding Operators and Procedures

ADDITIONAL CLAUSE AFTER 3.4.4:

PS L 1.2.5.1 Competence of Workmen

"The Contractor shall employ only competent and coded welders and shall submit certificates proving the competence of welders. The Engineer will ask for additional competence tests if and when required."

PS L 1.2.5.2 Welding Procedure

Welding is to conform to the latest edition of API 1104 and BS 4515 field welding of carbon steel pipelines.

Before the start of any welding work under this Contract, the Contractor shall submit his proposed welding procedures of the various types of welds to the Engineer for approval. The Engineer may require procedures to be qualified by destructive testing.

Once the welding procedures have been approved, no modifications will be allowed without the consent of the Engineer in writing.

No welding shall be done until the welding procedures and welders have been properly qualified in accordance with the procedure and performance qualification test requirements of SANS 044. Exception may be allowed if the fabricator can submit records of such tests which have been made by an independent inspection authority.

PS L 1.3 JOINTING MATERIALS

PS L 1.3.1 Flanges and Accessories

ADD THE FOLLOWING TO THIS SUB-CLAUSE:

"The requirements of SANS 1123 are applicable.

All flanges for pipes of nominal bore up to 150mm shall be full face slip-on flanges made of ASTMA 105 grade 1 steel to ANSI B16.5.

All flanges for pipes of nominal bore exceeding 150mm shall be full face flanges made of grade 43 steel to BS 4360 (or equal). Bolts shall be made from grade B steel to ASTM A307.

Stainless steel bolts are to be used for all stainless-steel flanges. Wall or puddle flanges shall be made of flat iron, 75mm X 8mm thick, welded to pipe specials on both sides of the flange. Where stainless steel flanges are to be bolted to mild steel flanges, isolating bushes and washers are to be used to electrically isolate two connected pipe sections. Gaskets used shall have adequate isolating capacity in terms of cathodic protection requirements.

Flange drilling to conform to SANS 1123/2001 (Table as indicated on the Drawings). It is the Contractor's responsibility to ensure that the flange sizes and drilling match.

Material for gaskets on flanged joints shall comply with the requirements of BS 4865 and be cut to the full width of the flange. The material shall be selected to accommodate the maximum conditions of temperature, pressure, and to be compatible with the material conveyed."

PS L 1.3.2 Loose Flanges

ADD THE FOLLOWING TO THIS SUB-CLAUSE:

"Slip-on flanges, when required, shall be welded inside and outside. There shall be a distance from the face of the flange to the pipe end equal to the pipe wall thickness plus 3mm. The seal weld shall be applied so that the flange face shall be free of weld spatter and does not require re-facing. Unless otherwise indicated, the flange bolt holes shall be orientated to straddle the vertical centreline in the case of vertical flange face. For horizontal flange face, bolt holes shall straddle the north-south centrelines."

PS L 1.3.3 Bolts, Nuts and Fasteners

ADD THE FOLLOWING NEW SUB-CLAUSE:

"Bolts, nuts and other fasteners for the assembly and installation of fabricated components and standard flanges other than anchor bolts shall be hexagon head type complying with the requirements of SANS 135 with ISO threads of the coarse pitch series. Except where high tensile fasteners are required the material shall be of equal or better corrosion or coating than the items being fastened.

Washers of the same or compatible material as the bolts shall be provided at each nut. The use of multiple washers will not be accepted. Spring washers together with flat washers shall be fitted to all nuts subject to vibration. Bolts shall project not less than 3mm and not more than 8mm from the head of the nuts after tightening. Projections on individual and common flange sets shall be identical.

Bolts, nuts and washes shall be hot dip galvanised as a minimum level of corrosion protection unless stainless steel is specified. Plated nuts, bolts and washers shall not be used on the permanent Contract Works.

High tensile bolts shall only be used when it is essential and shall be coated to a system approved by the Engineer."

PS L 1.3.4 Couplings

ADD THE FOLLOWING NEW SUB-CLAUSE:

"General purpose flexible couplings for M.S. and 3CR12 pipelines shall be "Viking Johnson" or similar type as approved by the Engineer and manufactured from the same material as the pipes to be coupled. Nuts and bolts shall comply with Sub-clause PSL 3.8.8.

All buried couplings shall be completely wrapped in "Denso" or equal approved mastic impregnated tape after installation and testing.

All exposed couplings shall be coated to the same specification as the pipeline in which they are used."

PSL 1.4 CORROSION PROTECTION

PSL 1.4.1 Protection of Steel Pipes and Accessories

All the pipe items of steel with diameters from 100mm and more must, unless otherwise specified be provided of three coats of epoxy paint (KSIR 88 or similar) to provide a final film of 300-micron dried thickness. Application must be according to the suppliers' prescription and must be on the inside and outside. Steel pipe items with diameters smaller than 100mm must be protected using galvanising or epoxy paint.

PSL 1.5 VALVES (Subclause 3.10)

Delete this clause and replace with the following:
Valves shall comply with the requirements of SANS 664. All valves shall be tested hydraulically to the specified pressure. During testing the valves shall meet two conditions: firstly, with the pressure applied with the valve completely open and thereafter to either side of the gate with the valve completely closed.
All valves shall be coated with a protective layer of paint or solution applied in an approved manner. All valves shall close in an anticlockwise direction when viewed from above on the spindle. All cap tops supplied on the range of valves, shall be of the same size in order that ne size valve key may be used.

PSL 2 CONSTRUCTION

PSL 2.1 LAYING

PSL 2.1.1 General

Where connecting to the existing pipeline the position of the existing pipeline must be established by excavating 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 work that is executed and proves to be unnecessary because this specification was not followed.

PSL 2.1.2 Depth And Covering (Subclause 5.1.4)

Delete this clause and replace with the following:
Except where permitted in PSL 2.1.2 hereafter, water pipes shall be positioned in such a way as to maintain a minimum cover of 1 000mm from the finished surface to the top of the pipe.
Where stormwater pipes and/or sewer pipes cross the water pipe, the minimum free distance between the outside of any of the pipes and the outside of the coupling of the water pipe shall be 150mm. Should, at the specified minimum cover, the free distance be less than 150mm, the water pipe will be lowered to the required level ensuring the free distance for a minimum distance of 1,0m, either side of the centre line of the stormwater- or sewer pipe, beyond which the pipe will be sloped back to the required level according to PSL 2.1.1 as detailed in subclause 5.1.4.2 of SANS 1200 L.

PS L 2.2 JOINTING METHODS

PS L 2.2.1 Rubber Joint Rings Push-Fit (Steel Pipe)

Rolling rubber joint rings shall comply with the relevant requirements of Part I of SANS 974-1 and shall not have more than one joint, which joint shall be positioned at the soffit of the pipeline.

PSL 2.2 CONNECTION AT EXISTING PIPES

Add the following to this clause as subclause 5.11:
All the consumers concerned as well as the Engineer and the Statutory Authority shall be notified in writing at least one week before the existing water supply is interrupted. Arrangements for the interruption of the water supply shall be made in advance with the Statutory Authority and the Contractor shall not be entitled to lodge any claims as a result of problems caused by non-compliance. Under no circumstances shall employees of the Contractor be allowed to interrupt the water supply at any time. All activities during the interruption of the water supply shall be planned and co-ordinated beforehand and all the preparations possible shall be completed before the interruption to minimise the inconvenience to the consumers. The Engineer has the authority to stop or to postpone the interruption and the Contractor will not be entitled to any claims in this regard, should the Engineer be of the opinion that the interruption was prolonged more than necessary as a result of bad planning by the Contractor.

PS L 2.3 SETTING OF VALVES, SPECIALS AND FITTINGS

ADD THE FOLLOWING TO THIS SUB-CLAUSE:
Valves shall be jointed such as to remain operative when the downstream pipe is removed.
All valves shall be placed as and were indicated on the drawing.

PSL 2.4 CONCRETE ENCASING

Replace the first sentence of L 5.4 with the following:
Concrete encasing with concrete with strength of 20 MPa/19mm, must be provided at positions indicated by the Engineer. Provision must be made to keep the pipe in position during the placement of the concrete encasing. The length of concrete encasing will be determined by means of site instructions from the Engineer.

PSL 2.4.1 Soil Crete Encasing

Add the following:
A mixture of Portland cement and gravel of base quality that is mixed in a ratio of 1:10 must be provided at positions indicated by the Engineer. Provision must be made to keep the pipe in position during the placement of the soilcrete encasing. The length of soilcrete encasing will be determined by means of a site instruction from the Engineer.

PSL 2.5 VALVE CHAMBERS

PSL 5.6.1 General
Substitute the first sentence of L 5.6.1 with the following:
The drawings of valve chambers, which are bound into the document, shall supersede the corresponding drawings in the standard specification.
Valve chambers, to the relevant specified sizes and specifications, shall be installed at all the new positions as indicated on the detailed drawings.

PSL 2.7 CLEANING OF PIPE

Sub clauses (a), (b) and (c) must be adhered to.

PSL 2.8 PIPE MARKERS

Pipe markers shall be installed at 50m intervals on the pipeline route, at all the newly installed isolation and scour valves as indicated on the detailed drawings as well as at all positions where the pipeline route deviates from the horizontal.

PSL 3 TESTING (Clause 7)

PS L 3.1 GENERAL

ADD THE FOLLOWING SUB-CLAUSES:

PS L 3.1.1 Inspection (Additional Clause 7.1.1 under 7.1)

The Contractor shall be responsible for supplying pipes and specials which comply with the specification in every way and he shall arrange for such inspection of his own work as well as work done by others as may be necessary to ensure this.

All welded steel items shall receive a 100% visual inspection of all welds after they have been cleaned and all visible defects shall be rectified.

The Employer reserves the right to appoint suitable qualified inspectors to inspect all stages of the manufacturing process in the Contractor's workshop and in those of his suppliers, on either a part time or a full time basis. The Contractor shall have no claim for moderate inconvenience due to the inspection procedure.

PS L 3.1.2 Standard of Acceptance (Additional Clause 7.1.2 under 7.1)

The Standard of acceptance of welding shall be laid down in API 1104: Standard for welding pipe lines and related facilities, for API 5L line pipe.

PS L 3.1.3 Marking (Additional Clause 7.1.3 under 7.1)

All individual pipe fittings and pipe specials shall be clearly marked with the appropriate reference numbers for identifying purposes. Reference numbers shall be legibly painted and also stamped on the one end of each pipework item.

The position of a weld test shall be clearly recorded and related to a pipe number.

PS L 3.2 INITIAL TESTS ON WELDING STEEL PIPES

PS L 3.2.1 Dye-Penetrant Test

ADD THE FOLLOWING TO THIS SUB-CLAUSE:

The Contractor shall perform non-destructive testing on complete welds being not less than 10% of the total welding performed, in addition to every weld for steel specials.

PS L 3.2.4 Paraffin Test (Additional Clause after 7.2.2)

All fabricated steel bends, fittings and specials which cannot readily be pressured tested in the works shall receive a paraffin test on all welds to ensure that they are completely watertight. Alternatively, other liquid penetrants may be used.

PS L 3.2.5 Destructive Tests (Additional Clause after 7.2.2)

The Engineer receives the right to call on the Contractor to perform destructive tests such as transverse tensile, root bend and flattering tests on test specimens cut from the pipes.

Separate payment will be made for such tests if they are called for, but the Contractor shall accept that the cutting out of a specimen and its testing may cause a moderate disruption of his work.

PSL 3.3 STANDARD HYDRAULIC PIPE TEST (Subclause 7.3.1)

PSL 3.3.1 Test pressure and time of test

Add the following to L 7.3.1.1:

Pipes shall not be tested against isolating valves. Special blank flanges or end caps, fully anchored, shall be provided for testing.

PSL 4 MEASUREMENT AND PAYMENT (Clause 8)

PSL 4.1 SCHEDULED ITEMS

PSL 4.1.1 Supply, Lay and Bed Pipes complete with couplings …….Unit

PSL 4.2.1.1 Steel Pipes Table 25

PSL 4.2.2 Extra-over 8.2.1 for the Supplying, Laying, and Bedding of Specials Complete with Couplings……..……..Unit: No

These shall be measured and paid for per installation, complete with the inclusion of the cutting of pipes, couplings, extra excavation and all extra material and labour that is required, including tees, fittings complete as shown on the drawings.

PSL 4.2.2.1 Extra-over 8.2.1.1 for the Supplying, Laying, and Bedding of Specials Complete with Couplings for Steel pipes

Bends, Tees and Reducers shall be steel, be flanged and drilled to Table 16 at all ends. End caps to be flanged at the open end. Bends to be long radius.. Separate flanges to be drilled to Table 25 with threading to match the steel pipe threading.

PSL 4.2.3 Extra-over 8.2.1 for the Supply, Fixing and Bedding of Valves ……...Unit: No
Add the following to L 8.2.3:

Valves are measured and paid for per installation, complete with the inclusion of the cutting of pipes, couplings, extra excavation and all extra material and labour that is required, including tees, fittings complete as shown on the drawings.

PSL4.2.4 Cut into and Connect to Existing Mains……Unit: No

The number of each type and diameter of pipe cut into small measure the cutting into existing mains. The Tendered rate shall include full compensation for all arrangements with the relevant authorities, isolating the main, cutting into the main to accommodate the connecting fitting, dewatering, excavating, removing of excess material, taking steps to prevent the ingress of soil, stones and other material into the main as well as all material and labour to connect the pipe.

PSLB BEDDING (Pipes)

Add the following to LB 1.1:
This specification also covers the bedding required for sleeve pipes.

PSLB 1MATERIALS (Clause 3)

PS LB 1.1 SELECTED GRANULAR MATERIAL
Substitute LB 3.1 with the following:

Selected granular material shall be an aggregate, sand or granular material, all of a non-cohesive nature and free from any organic material, of which the grading analysis shows 100 % passing a 13, 2 mm sieve and not more than 5 % passing a 0,075 mm sieve.

Only if approved by the Engineer may sand from the trench excavations be used as selected material

PS LB 1.2 SELECTED FILL MATERIAL

Substitute LB 3.2 with the following:
The requirements of PS LB 3.1 shall apply mutatis mutandis.

PS LB 1.3 BEDDING

Add the following to LB 3.3:
All pipes shall be classified as flexible pipes and shall have a bedding of selected granular material and selected fill material.

PS LB 1.4 SELECTION

PS LB 1.4.1 Suitable Material from Trench Excavation Available

Replace the first sentence of LB 3.4.1 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.

PSLB 1.5 SUITABLE MATERIAL NOT AVAILABLE FROM TRENCH EXCAVATIONS (Subclause 3.4.2)

Change the free haul distance in this subclause from 0,5 km to 2,0 km.

PSLB 2 MEASUREMENT AND PAYMENT

PSLB 2.1 FREEHAUL (Subclause 8.1.6)

PS LB 2.2 PRINCIPLES

PS LB 2.2.1 Provision of Bedding from Trench Excavation

a) Selected granular material .....Unit: m³

b) Selected fill material ..... Unit: m

The rates shall cover the cost of acquiring, from within 0,5 km, bedding that complies with the relevant requirements of the specification, of delivering it to points alongside the trench spaced to suit the Contractor's methods of working, and of disposing of displaced material within a free haul distance of 0,5 km.

In terms of the standardized specifications covering pipelines, the rate for the supply and laying of pipelines covers the cost of handling bedding material from alongside the trench and placing it under and around the pipeline

.

PSLB 2.2.2 Supply only of Bedding by Importation

From other necessary excavations

a) Selected granular material .....Unit: m

b) Selected fill material ..... Unit: m

PSLB 2.2.3 From commercial sources

a) Selected granular material ..... Unit: m

b) Selected fill material ..... Unit: m

The rate shall cover the cost of acquiring, regardless of distance, the required bedding from commercial sources (see Subclause 8.3.4 of SANS 1200 D or Subclause 8.3.4 of SANS 1200 DA, as relevant), of delivering it to points alongside the trench spaced to suit the Contractor's methods of working, and of delivering it to points alongside the trench spaced to suit the Contractor's methods of working, and of disposing of material displaced by such importation, within a free haul distance of 0,5 km.

PSLB 2.2.4 Encasing of Pipes in Concrete ..... Unit:

Separate items will be scheduled for each size of pipe and for each grade of concrete specified.
The volume will be computed from the dimensions of the concrete as given on the drawing.

The rate shall cover the cost of dealing with any excavation (in all materials including disposal of surplus) that is additional to that measured under the item for pipe trench excavation, the cost of encasing the pipe in concrete including the cost of formwork (if any), etc., and the cost of formwork to form flexible joints at 4 m centres.

PS LB 2.2.5 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.

SANS 1200 GA: CONCRETE (SMALL WORKS)

This specification covers the requirements for concrete (plain and reinforced) for small works associated with pipelines, roads, railways, pump stations, etc. It covers the basic materials, the plant did formwork required, the quality, manufacture, arid curing of concrete, tolerances in workmanship, testing, and the methods by which the finished structure is to be measured for the purposes of payment

PSGA 1 MATERIAL

PSGA 1.1.1 Applicable Specifications

Add the following to G 3.2.1:
Portland cement that conforms to SANS 471

PSGA 1.1.2 Storage of Cement

Add the following to G 3.2.2:
Consignments of cement shall be used in the same sequence as that in which they are delivered to site. No cement shall be used which has been stored on site for a longer period than 6 (six) weeks. All cement so stored for a longer period than 6 (six) weeks, all cement damaged in any way, and all cement which does not comply with the specification, shall be removed immediately and permanently from the site.

PSGA 2 PLANT

PSGA 2.1 Formwork

PSGA 2.1.1 Ties

Add the following to G 4.4.3:
No ties will be allowed in vertical walls and permanent metal ties shall have a minimum concrete cover of 40 mm. Tie holes shall be filled with an approved non-shrink epoxy grout.

PSGA 3 CONSTRUCTION

PSGA 3.1 REINFORCEMENT

PSGA 3.1.2 Cover

Substitute G 5.1.3 with the following:

The cover of concrete over reinforcement, unless otherwise indicated on the drawings, shall be not less than 40 mm.

PSGA 3.3 FORMWORK

PSGA 3.3.1 Classification of Finishes

Add the following to G 5.2.1:

The following surface conditions are required in the various portions of the finished concrete:

(a) Rough Concealed surfaces and surfaces lower than 100 mm below finished ground level.

(b) Smooth

All surface finishes not classified as "rough" in paragraph (a) shall be classified as "smooth". All exposed edges unless otherwise indicated on the drawings, shall be chamfered 20 mm x 20 mm by means of triangular fillets fixed to the formwork.

PSGA 3.4 CONCRETE

PSGA 3.4.1 Quality

PSGA 5.4.1.2 Consistency

Add the following to sub clause G 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.

PSGA 3.4.1.2 Strength concrete

Add the following to G 5.5.1.7:

The grade of strength concrete and the maximum nominal size of coarse aggregate for each portion of the works, unless otherwise indicated on the drawings, shall be as follows:

(a) Blinding layers and encasing of pipes	15 MPa/19 mm
(b) Benching	25 MPa/19 mm
(c) Screeds	25 MPa/10 mm
(d) Reinforced concrete	35 MPa/19 mm

PSGA 3.4.1.3 Durability

Concrete shall be so proportioned to ensure that the water/cement ratio 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.

PSGA 3.4.2 Concrete Surfaces

Add the following to GA 5.4.8.1:

Concrete surfaces under screeds, granolithic finishes or benching shall be brought up to a plane, uniform surface with a suitable screed board.

PSGA 3.4.3 Construction Joints

The use of construction joints must be minimised and may only be placed as shown on the drawings or at positions as approved by the Engineer. At all construction joints in walls a PVC water stop without a centre bulb must be placed as shown on the drawings. Alternative materials with similar properties may be proposed but may only be installed after approval of the Engineer.

PSGA 3.4.4 Wood-floated finish

Where wood floating is specified or scheduled, the surface shall first be given a finish as specified in G 5.5.10.1 and after the concrete has hardened sufficiently; it shall be floated to a uniform surface free from trowel marks. The screed surface shall be wood-floated, either by hand or machine, only sufficiently to produce a uniform surface free from screed marks.

PSGA 3.4.5 Steel-floated finish

Where steel floating is specified or scheduled, the surface shall be treated as specified in PS G 5.5.10.4 except that, when the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, the screed surface shall be steel-trowelled under firm pressure to produce a dense, smooth, uniform surface free from trowel marks.

PSGA 4 Measurements and Payment (Clause 8)

PSGA 8.1.1 Formwork

Formwork, other than formwork covered by 8.1.1.2 and 8.1.4, will be measured as the net area of the face of the concrete to be supported during the deposition of concrete. No deduction will be made for fillets and splays of size up to 50 mm x 50 mm or for openings of diameter up to 0,7 m or of area up to 0.5 m².

Formwork in continuous lengths of narrow widths and of fillets or splays over 20 mm x 20 mm will be measured by length, the width or range of widths being stated in the schedule. Boxing-out, the forming of holes, and other such operations will be measured by number, basic dimensions, perimeters, or drawing references, as stated in the schedule.

The unit rate shall cover the cost of all parts of formwork in contact wi.th the concrete, and the necessary bearers, struts, and other supports, plus the labour and plant necessary to erect and strike such formwork.

PSGA 8.1.2 Reinforcement

Steel for normal reinforced concrete will be measured net by mass of all bars, including supporting steel detailed on the reinforcing schedules. The mass will be computed from the nominal bar size and nominal mass per unit length. No allowance will be made for cutting, waste, spacer devices (materials other than steel bars), or binding wire.

Steel reinforcement for precast concrete units will not be measured unless so scheduled (see 8.6). Welded mesh will be measured by area as shown on the drawings, no allowance being made for cutting, waste, laps, or deductions for end cover. The areas measured will be those of the concrete floor or slab being reinforced by means of mesh. In the case of continuous unit partly reinforced by mesh, the area will be computed from the outside dimensions of the area covered by mesh regardless of whether or not additional reinforcing steel is present in the same area. Steel off cuts resulting from the cutting and bending of reinforcement in accordance with the bending schedules shall be deemed to be the property of the Contractor.

PSGA 8.1.3 Concrete

a) Concrete will be measured net to the dimensions shown on the drawings or to the dimensions cast, whichever are the smaller. Structural elements that are undersized will be measured for payment only if they are accepted by the Engineer

b) No allowance will be made for concrete required to make up overbreak in soft excavation, but payment will be made for additional concrete or formwork, or both, ordered in writing by the Engineer to replace unsuitable material or overbreak in hard rock or in intermediate excavation.

The unit rates shall cover the cost of the provision of concrete (made with ordinary portland cement unless otherwise scheduled), mixing, testing, placing, compacting, the forming of stop-ends and unforeseen construction joints, striking of for levelling as applicable, and curing and repairing where necessary, together with the cost of all parts of formwork in contact with the concrete aid the necessary bearers, struts, and other supports, plus the layout and plant necessary to erect and strike such formwork.

PSE.11. MANUALS

PSE.11.1 Three complete sets of maintenance and operator manuals shall be supplied at first handover.

PSE.11.2 The manual shall include at least the following for all the equipment:

- Sales pamphlets
- Full technical information
- Connection diagrams
- As built drawings
- Calibration and commissioning information.

PSE.12. DRAWINGS

PSE.12.1 Workshop drawings shall be submitted to the engineer for approval before any manufacturing commences.

PSE.13. QUALITY OF MATERIAL

PSE.13.1 Only new material and equipment of the highest quality will be accepted.

C3.6 PARTICULAR SPECIFICATIONS

C3.6.2 Particular Specifications

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

PA CONSTRUCTION OF STEEL PIPELINES

CONTENTS

PA 1 SCOPE
PA 2 STANDARDS
PA 3 MATERIALS
PA 4 DESIGN AND SETTING OUT
PA 5 ENTRY AND WORK UPON LAND
PA 6 SITE PREPARATION
PA 7 EARTHWORKS
PA 8 LAYING AND JOINTING OF PIPES AND SPECIALS
PA 9 REPAIRS TO COATINGS AND PROTECTION OF JOINTS
PA 10 CROSSING OF ROADS AND STREAMS
PA 11 HYDROSTATIC TESTING
PA 12 STERILISATION
PA 13 DRAINAGE OF PIPELINE
PA 14 MISCELANEOUS CONSTRUCTION WORKS AND WORKMANSHIP
PA 15 FINAL PAINTING
PA 16 MARKER BEACONS, BENCHMARKS, TRIANGULATION BEACONS AND MARKING OF VALVE CHAMBERS
PA 17 COMPLETION DRAWINGS
PA 18 SUPERVISION AND INSPECTION
PA 19 MEASUREMENT AND PAYMENT

PA 1 SCOPE

This specification covers the construction of pressure pipelines of steel for the conveyance of water at ambient temperatures.

PA 2 STANDARDS

The following Standard Specifications, Codes of Practice and Regulations are referred to and shall apply as specified hereinafter. The latest issues shall apply:

SABS 135	ISO Metric black bolts, screws and nuts
SABS 136	ISO Metric precision hexagon-head bolts, screws and nuts
SABS ENV-197-1	Common Cements
SABS ENV-413-1	Masonry Cements
SABS 509	Malleable cast iron pipe fittings
SABS 533	Black polyethylene pipes for the conveyance of liquids
SABS 546	Cast iron fittings for fibre-cement pressure pipes
SABS 558	Cast iron surface boxes and manhole and inspection covers and frames SABS 763 Hot-dip (galvanised) zinc coatings
SABS 920	Steel bars for concrete reinforcement
SABS 952	Polyethylene sheet
SABS 966	uPVC pressure pipes
SABS 974	Rubber joint rings
SABS 986	Precast reinforced concrete culverts
SABS 1024	Welded steel fabric for concrete reinforcement
SABS 1083	Aggregates from natural sources
SABS 1090	Sand for plaster and mortar
SABS 1149	Flat and taper steel washers
SABS 1223	Fibre-cement pressure pipes and couplings
SABS 044	Code of practice for welding
BS 2815	Compressed asbestos fibre jointing
Act 85/1993	Occupational Health and Safety Act (as amended)
Act 15/2003	Explosives act and regulations (as amended)

PA3 MATERIALS

PA 3.1 PIPES AND FITTINGS

PA 3.1.1 Steel pipes, specials and couplings

PA 3.1.1.1 Steel pipes and specials shall conform to Particular Specification PB – Manufacture of Steel Pipes and Fittings.

PA 3.1.1.2 Linings and coatings to steel pipes and specials shall conform to Particular Specification PB - Manufacture of Steel Pipes and Fittings.

PA 3.1.2 Galvanized steel pipes and fittings.

PA 3.1.2.1 Galvanized steel pipes shall conform to SABS 62, medium and heavy thicknesses.

PA 3.1.2.2 Steel fittings shall be galvanized heavy weight fittings and shall conform to BS 1740 in applications where pressures exceed 1.4 MPa. For pressures 1.4 MPa or lower, galvanized malleable iron fittings to BS 143 and/or SABS 509 will be acceptable.

PA 3.1.3 Flanges

Except where specified to the contrary elsewhere in the documents, all flanges shall be steel-plate for welding and shall conform to BS 4504 or SABS 1123. Should the required flange size fall beyond the range of BS 4504, mating dimensions shall be in accordance with ISO standard 2084 with thicknesses adequate to withstand closed - end test pressure.

Flanges of 125 mm NB and larger shall have a minimum pressure rating of 1 MPa, with flat joint faces machine finished to a roughness value of 12.5 micrometers and with weld preparations in accordance with BS 2633, fig. 39 or 40. Weld preparation in accordance with fig. 41 shall be acceptable for flanges 100 mm NB and smaller.

PA 3.1.4 Bolts, nuts and washers

PA 3.1.4.1 Bolts and nuts shall conform to SABS 135 or SABS 136. Bolts shall be of sufficient length for at least two and maximum four screw threads to protrude from the nut when assemblies are fully tightened. When bolts are in vertical position, nuts must be on the bottom side. Bolts, nuts and washers to be hot-dipped galvanized to SABS 763 Type C.

PA 3.1.4.2 Washers shall be of appropriate material and dimensions shall conform to SABS 1149.

PA 3.1.5 Gaskets

Gaskets for flanged joints shall be of compressed asbestos fibre to BS 2815 Grade "A" and full faced with a minimum thickness of 3 mm to suit pressures. Faces to be prepared with bolt grease to prevent sticking to flange faces.

PA 3.2 VALVES

PA 3.2.1 Valves shall conform to Particular Specification PC - Supply of Valves.

PA 3.2.2 Stop cocks shall be brass or gunmetal heavy pattern screwdown types conforming to SABS 226.

PA 3.3 WATER METERS

PA 3.3.1 Water meters shall be capable of metering flow within an accuracy of 2 % of true flow over rated flow ranges. Turndown ratios shall not be less than 1:10 for single meters and 1:20 for compound meters.

PA 3.3.2 Each meter shall be installed complete with strainers or dirt traps on the upstream side.

PA 3.3.3 Meters of 40 mm size and smaller shall be rotary piston type domestic meters with integrators calibrated in cubic meters. Integrators shall have at least seven effective cyclometer digits.

PA 3.3.4 Meters larger than 40 mm shall be "Meinecke" or similar type rotary meters with interchangeable mechanisms. Meters shall be supplied complete with one spare mechanism for every five or part of five meters of similar size and rating. Integrators shall be calibrated in cubic meters with at least seven effective cyclometer digits.

PA 3.4 LINING AND COATING MATERIALS

Materials, other than concrete, for the lining and/or coating of pipes, specials and fittings shall conform to Particular Specification PB – Manufacture of Steel Pipes and Fittings.

PA 3.5 POLYETHYLENE SHEETS

Polyethylene sheets shall conform to SABS 952

PA 3.6 PRECAST REINFORCED CONCRETE CULVERTS

Precast reinforced concrete culverts shall conform either to SABS 986, class "S" loading or to SATS class 1 loading.

PA 3.7 CAST-IRON MANHOLE COVERS

Cast-iron manhole covers and frames shall conform to SABS 558.

PA 3.8 FENCING MATERIALS AND GATES

Materials for fencing shall conform to Clause PA14.1 of this specification.

PA 3.8.1 Padlocks shall conform to the requirements of CKS 280 and shall be supplied with 10 master keys.

PA 3.9 CEMENT

PA 3.9.1 Cement shall be ordinary or rapid hardening Portland cement conforming to SABS ENV 197-1.

PA 3.9.2 The alkali content of Portland cement when expressed as sodium oxide (Na2O) equivalent shall not be greater than 0,6 % by mass of cement determined in accordance with SABS Method 551 or any other reduced value as determined by the Engineer, where : % Na2O equivalent = %Na2O + (0,658 x %K2O)

PA 3.9.3 All cement shall be fresh and shall be used strictly in order of delivery. All cement in storage for longer than 10 weeks and all cement in unsealed pockets shall be removed from storage and be discarded.

PA 3.9.4 Cement shall be stored in weather-proof and damp-proof silos or sheds.

PA 3.10 AGGREGATES FOR CONCRETE AND MORTAR

PA 3.10.1 Aggregates used in the manufacture of concrete shall conform to SABS 1083.

PA 3.10.2 The aggregates shall be evaluated for potential alkali reactivity using a method for testing developed by CSIR, i.e. "An accelerated method for testing the potential alkali reactivity of siliceous aggregates" by R.E. Oberholster and G. Davis, published in "Cement and Concrete Research" Vol. 16, PP. 181 - 189, 1986.

PA 3.10.3 The chloride content of the sand determined by SABS Method 830 shall not exceed 0,01 % per mass.

PA 3.10.4 Coarse aggregate shall be suitable for concrete subject to surface abrasion, shall be of grading category 1 and of the largest possible size that would allow placement of concrete without difficulty.

PA 3.10.5 Sand for mortar or plaster shall conform to SABS 1090.

PA 3.11 WATER FOR CONCRETE AND MORTAR

PA 3.11.1 Water used for concrete, mortar, plaster or cement slurry shall be clean and free from injurious amounts of oil, acid alkalis, vegetable and mineral matter.

PA 3.11.2 Water shall generally conform to the recommendations in the appendix to BS 3148.

PA 3.12 CONCRETE

PA 3.12.1 Concrete shall be a homogeneous mixture of cement, water, sand and coarse aggregate and shall be mixed, placed, cured and tested in accordance with SABS 1200GA.

PA 3.12.2 Concrete shall have the following minimum compressive strengths at 28 days, unless otherwise specified.

PA 3.12.2.1 Reinforced concrete - 25,0 MPa

PA 3.12.2.2 Mass concrete - 15,0 MPa

PA 3.13 FORMWORK
Formwork shall conform to the requirements of section "GA" SABS 1200.

PA 3.14 CONCRETE REINFORCEMENT

PA 3.14.1 Bar reinforcement shall conform to SABS 920.

PA 3.14.2 Welded steel fabric reinforcement shall conform to SABS 1024.

PA 3.15 BRICKS
Building bricks and blocks shall conform to SABS 227.

PA 3.16 BACKFILL MATERIAL

PA 3.16.1 General

Material for bedding of pipes and for selected backfill around pipes shall be free from vegetable matter and hard, sharp and flakey particles or other materials harmful to the pipes or to the protective coatings of pipes.

PA 3.16.2 Bedding material shall be either of the following class:

PA 3.16.2.1 Class I: Finely graded, composed of material with the following properties:

(i) Percentage by mass passing: 4,75 mm screen - 100 %, 0,425 mm screen - 80 to 100 % 0,002 mm screen - 0 to 45 %

(ii) Liquid limit (LL) as determined in accordance with SABS Method 851 shall not be more than 30 %, when performed on all the material passing the 0,425 mm sieve.

(iii) Plasticity index (PI) as determined in accordance with SABS Method 852 shall not be more than 15, when performed on all the material passing the 0,425 mm sieve.

(iv) Linear shrinkage (LS) as determined in accordance with SABS Method 853 shall exceed 5 %, when performed on all the material passing the 0,425 mm sieve.

PA 3.16.2.2 Class II: Medium graded, composed of material with the following properties.

(i) Percentage by mass passing: 4,75 mm screen - 80 % to 100 % 0,425 mm screen - 60 to 80 % 0,002 mm screen - 0 to 40 %

(ii) Liquid limit (LL) as determined in accordance with SABS Method 851 shall not be more than 35 %, when performed on all the material passing the 0,425 mm sieve.

(iii) Plasticity index (PI) as determined in accordance with SABS Method 852 shall not be more than 18, when performed on all the material passing the 0,425 mm sieve.

(iv) Linear shrinkage (LS) as determined in accordance with SABS Method 853 shall not exceed 7 %, when performed on all the material passing the 0,425 mm sieve.

PA 3.16.2.3 Class III: Granular, composed of material with the following properties.

(i) Percentage by mass passing: 9,5 mm screen - 100 %, 4,75 mm screen - 70 to 100 %, 0,425 mm screen - 30 to 60 %, 0,002 mm screen - 0 to 35 %

(ii) Liquid limit (LL) as determined in accordance with SABS Method 851 shall not be more than 40 % when performed on all the material passing the 0,425 mm sieve.

(iii) Plasticity index (PI) as determined in accordance with SABS Method 852 shall not be more than 20, when performed on all the material passing the 0,425 mm sieve.

(iv) Linear shrinkage (LS) as determined in accordance with SABS Method 853 shall not exceed 10 %, when performed on all the material passing the 0,425 mm sieve.

PA 3.16.3 Items PA 3.16.2.1 to 3.16.2.3 for selected fill are conveniently summarized in the following table:

PERCENTAGE BY MASS PASSING SCREENS					ATTERBERG LIMITS SHALL NOT EXCEED		
MATERIAL / CLASS	9,5 mm	4,75 mm	0,425 mm	0,002 mm	LIQUID LIMIT (LL) %	PLASTICITY INDEX (PI)	LINEAR SHRINKAGE (LS) %
Finely graded / Class I	100	100	80-100	0-45	30	15	5
Medium graded / Class II	100	80-100	60-80	0-40	35	18	7,5
Granular / Class III	100	70-100	30-60	0-35	40	20	10

PA 3.16.3 General for all classes selected fill

Where in the opinion of the engineer no material suitable for use as selected fill is available from the excavations within 200 m of where it is required, then the contractor shall, on the engineer's written instructions, either import selected fill to the trench side or load and transport selected fill from material selected and stockpiled at another point along the pipe trench.

If, due to the negligence of the contractor, selected materials become contaminated with the rest of the material or with other matter such that they no longer comply with the requirements stated above, the contractor shall replace them with approved material at his own expense.

Importation of selected fill shall be undertaken by the contractor from approved borrow pits to be identified by the contractor away from the working strip and shall be negotiated for by the contractor at tender stage, established, worked and finally smoothed over and tidied or reinstated in accordance with the property owners requirements. No additional payment shall be made for importation of selected fill.

PA 3.16.4 Selected backfill

PA 3.16.4.1 For pipelines with organic coatings, selected backfill shall conform to the requirements of Clauses PA3.16.2 to PA3.16.3.

PA 3.16.5 Common Fill

PA 3.16.5.1 The material for common fill shall comprise mainly soil, fine material, gravel or shattered rock available from the trench excavation, but shall not contain any stones, boulders or shattered rock fragments with maximum dimensions in excess of 150 mm.

PA 3.17 STORAGE, HANDLING AND TRANSPORT OF PIPES, SPECIALS AND FITTINGS

PA 3.17.1 General

PA 3.17.1.1 The Contractor shall be responsible for:

PA 3.17.1.1.1 The supply, delivery, storage, care and insurance of pipes, specials, fittings, valves and other materials and equipment.

PA 3.17.1.1.2 The receipt, provision of craneage and labour for the off-loading of pipes, specials, fittings, valves, materials and equipment at the store or alongside the pipeline trench.

PA 3.17.1.1.3 The provision of suitable access along the pipeline route and within the pipeline servitude for the purpose of off-loading pipes, valves, etc. and including :

(a) Benching along mild side slopes.

(b) Handling and stringing of pipes, specials and fittings at very steep inclines where the pipes, specials and fittings were stacked either at the top or the bottom of these inclines.

PA 3.17.1.1.4 Wherever suitable access to the pipeline servitude is not available, the Contractor shall provide and maintain access as instructed by the Engineer.

PA 3.17.1.2 The Engineer shall be afforded every opportunity of inspecting such materials on their arrival at site prior to them being off-loaded. If their condition is unacceptable to the Engineer on arrival, the Contractor shall remove them forthwith from the Site and replace such materials at his own cost and to the satisfaction of the Engineer.

PA 3.17.2 Transport

Pipes and specials shall only be transported on properly constructed or adapted vehicles containing correctly shaped and padded cradles or with strong, sawdust filled bags separating pipes and vehicle body as well as individual pipes from each other. Special care shall be taken with the transport of bitumen coated steel pipes as damaged coatings might be subject to rejection in terms of Clause 3.17.1.2.

PA 3.17.3 Handling

PA 3.17.3.1 Pipes, specials and fittings shall not be subjected to rough handling at any time. Under no circumstances shall same be dropped during loading or off-loading or be allowed to collide with each other.

PA 3.17.3.2 Coated steel pipes shall only be lifted by means of broad band slings at least 500 mm wide for pipes up to 500 mm NB and 1 000 mm wide for larger pipes, or as approved by the Engineer. Slings must comply with the requirements of the Occupational Health And Safety Act, Act 85/1993 (as amended). The regulations regarding the safe working loads and bearing pressures for slings must also be adhered to.

PA 3.17.3.3 All pipes shall only be lifted by means of approved spreader beams with at least two slings. The length and stiffness of the spreader beam must be such that safe bearing pressures and deflections of the pipes, linings and coatings are not exceeded.

PA 3.17.4 Storage

PA 3.17.4.1 Pipes shall generally be distributed and stored as close as possible to the laying position in order to minimize double handling. Where pipes are strung alongside the trench, they should be placed on the side away from excavated material.

PA 3.17.4.2 Where pipes, specials and fittings are to be stockpiled in bulk storage yards, the Contractor shall make his own arrangements for a suitable area which shall meet with the Engineer's approval. The stockpiling area shall be adequately fenced and protected by a lockable gate and a watchman shall be maintained at all times.

PA 3.17.4.3 Pipes and specials shall be strung or stockpiled on level, well drained ground in a manner such that they will not be in contact with the ground, tree stumps, or other sharp objects and all vegetation and other combustible material shall be completely removed to at least 5 meters from the nearest pipe or special.

PA 3.17.4.4 Coated steel pipes shall always be supported on a sufficient number of approved soft bolsters to prevent damage or permanent deformation of coatings. Coated pipes shall not be stacked more than two pipes high, each layer separated by bolsters.

PA 3.17.4.5 The number of layers of bare steel pipes in a stockpile shall not exceed:

$$N = \frac{1\,730 \times Y \times t\,(D-t)2}{}$$

Where:

N = Permissible number of layers
Y = Minimum yield stress of steel in MPa t = Wall thickness in mm
D = Outside diameter in mm

PA 3.17.4.6 Each class and size of pipe shall be stored separately in its own stockpile.

PA 3.17.4.7 All rubber rings or other materials which will deteriorate under the action of sunlight, ozone or inclement weather, shall be stored in permanent shade in lockable weatherproof sheds. Welding and the running of welding machines and electric machinery shall not be permitted in or near places where rubber or plastic products are stored and care shall be taken at all times to prevent contamination of these products by oil or other petroleum derived solvents.

PA 3.17.4.8 Valves shall be stored in orderly groups on prepared floors to prevent damage, distortion or corrosion of flanges or working parts. All metal valves may be stored in the open but full protection shall be afforded to valves with non-metallic seals or working parts. Under no circumstances shall valves be stored in direct contact with the ground.

PA 3.18 RECORDS OF MATERIALS ON SITE

PA 3.18.1 The Contractor shall keep and maintain a complete and comprehensive record of each pipe, special and fitting delivered to Site. The record shall at least denote the reference number, size, pressure class, and

location in the pipeline, date and condition of delivery and the location of delivery and the location of storage. Copies of the record shall be submitted to the Engineer at the end of each month or whenever requested by the Engineer.

PA 3.18.2 Where pipes, specials and fittings are delivered without reference numbers, same shall be provided by stenciling, labeling or other methods approved by the Engineer.

PA 3.19 REPAIRS

PA 3.19.1 The Contractor shall be responsible for the repair of all defects in pipes, specials, etc, delivered to and accepted on site.

PA 3.19.2 The Contractor shall inspect the coatings and linings of all factory-coated and lined steel pipes and specials as follows:

(i) Epoxy: Shall be inspected in accordance with SABS 1217.

(ii) Organic coatings (bitumen): Shall be inspected with an approved holiday detector equipped with rolling spring or copper bristle brush electrode operating at 15 kV at a nominal pulse frequency of 30 Hz.

(iii) Tape wrappings: This shall be the same as for the organic coatings above except that the operating voltage shall not be less than 50 % of the stated breakdown voltage of the tape being used and should not be more than 80 % thereof.

Areas which cannot be tested whilst pipes are supported on cradles or otherwise, shall be tested whilst pipe is suspended above the trench immediately prior to laying. Defective areas of linings and coatings shall be marked when detected and shall be repaired, to the Engineer's approval, with materials specified respectively for the original and/or coating. Repaired linings and coatings shall be inspected and re-tested after repair and shall have the same properties as specified for the original ones.

PA 3.19.3 Repairs to dented steel pipes and specials shall only be attempted if the dimensions between the lowest point of a dent and the original pipe contour is less than 2 % of the outside diameter of the pipe or special for pipes and specials up to 508 mm OD and 1 % of the outside diameter for larger pipes and specials. Repair of these minor dents shall be done as approved by the Engineer and all such repairs shall be tested by the application of a dye penetrant to detect cracks or laminations in the metal.

PA 3.19.4 Dents in steel pipes or specials of which the depth exceed the above limits and any dents which contain scratches or grooves or which affect the curvature of pipe barrels at welds shall be cut out by cutting of a length of pipe barrel long enough to eliminate the defect. Damaged sections shall be replaced in accordance with the Engineer's instructions. The ends of pipes intended for field welding shall be re-chamfered to 30 ° ± 5 ° width of root face 1,6 mm ± 0,8 mm .

PA 3.20 MAINTENANCE OF CLEANLINESS

PA 3.20.1 End covers to pipes and specials shall be kept firmly in position until installation of same in the trench.

PA 3.20.2 The interior surfaces of all pipes, specials, valves and fittings shall at all times be kept free from dust, silt

and foreign matter and access for rodents, animals and birds shall be prevented. Pipes and specials shall not be used as shelters by staff or for the storage of garments, tools, materials, food containers or similar goods. Particular care shall be exercised at all times to prevent faeces contamination of pipe interiors by staff, casual visitors, passersby or monkeys and baboons.

PA 4. DESIGN AND SETTING OUT

PA 4.1 DESIGN

PA 4.1.1 General

The detailed design of the pipeline shall be the responsibility of the Engineer.

PA 4.1.2 As-built information by Contractor

PA 4.1.2.1 The Contractor shall be responsible for detailed surveys and the preparation of detailed working drawings comprising the following:

(i) Detailed profile drawings showing clearly the exact pipeline levels and grades,
(ii) the exact location of valves, fittings and specials,
(ii) the location of all roads and/or other service and utility installations crossed by the pipeline,
(iv) the location of rivers, streams, and other topographical features.

PA 4.1.2.2 Drawings shall be on size A1 standard sheets with 2,0 mm minimum size lettering and shall be to a scale not smaller than that of the Tender drawings. The drawings shall generally conform to the standard and layout of the Tender drawings.

PA 4.1.2.3 Working drawings shall be submitted for the Engineer's approval in quadruplicate and in the following manner:

(a) Road crossings - 14 working days after construction of crossing is completed.

(b) All other drawings - 25 working days after construction of works on a specific working drawing.

PA 4.1.2.4 The Engineer shall check all drawings and may instruct any drawings to be altered or corrected and the Contractor shall do so at his own expense and re-submit drawings for approval.

PA 4.1.3 General design criteria

PA 4.1.3.1 Pipelines shall be laid in straight lines or grades between changes of direction or grades. The pipe grade shall follow the general configuration of the ground and shall not be flatter than 1: 500. The following minimum depths of cover to natural ground level over the crown of the pipe shall be maintained:

LOCATION	MINIMUM DEPTH OF COVER OVER CROWN OF PIPE IN mm
Cultivated ground	1 200
Veld	1 000
Through towns and built-up areas	1 000
Uncultivated ground with shallow rock	1 000

PA 4.1.4 Design by Engineer

PA 4.1.4.1 The Tender drawings show the alignment of the pipeline, the approximate profile of the pipeline, pipe and valve sizes, geological data and pressure classifications, approximate location of valves and fittings. Also included are typical designs for road and river crossings and miscellaneous pipeline structures.

PA 4.1.4.2 At least 7 working days before construction of any part or parts of the Works is due to commence in accordance with the Contractor's detailed Works programme, which are to be submitted in terms of the Contract, the Engineer shall submit duplicate working drawings of such part or parts of the Works to the Contractor and no construction work shall commence before the detailed working drawings are in possession of the Contractor's site staff.

PA 4.1.4.3 No deviation from working drawings shall be allowed without the Engineer's approval. Should the Contractor require deviations or alterations to drawings to suit his construction methods or otherwise, such deviations and alterations shall only be considered by the Engineer on the strength of detailed drawings prepared by the Contractor and submitted to the Engineer in duplicate at least 15 working days before construction involving such deviations or alterations is due to commence. Clauses PA 4.1.2.2 and PA 4.1.2.4 of this specification shall apply where relevant. The cost of surveys, preparation and submission of such drawings and all delays in completion of the Works resulting from such deviations or alterations shall be to the Contractor's account.

PA 4.2 SETTING OUT

PA 4.2.1 The Engineer shall establish the basic reference pegs and benchmarks on Site and give to the Contractor the particulars thereof in sufficient time to enable the Contractor to meet his approved programme. Thereafter the Contractor shall be responsible for the true and proper setting out of the Works and for the correctness of the position, levels, dimensions and alignment of all parts of the Works and for the provision of all necessary instruments appliance and labour in connection therewith.

PA 4.2.2 Setting out of the Works shall be performed by an experienced Engineering Surveyor and shall be to the following limits of accuracy:

(a) Pipe centreline

Shall be in straight lines between changes of direction and/or grade and shall in its final laid position be within 100 mm of the plan centreline on the approved drawings.

(b) Pipe invert levels and gradients

In the final laid position, pipe invert levels shall be within ± 25 mm of the invert levels on approved drawings but notwithstanding this tolerance, the same direction of grade as per approved drawings shall be maintained and the grade shall not be flatter than 1:500 (0,2%).

(c) Position of fittings, specials and valves

Fittings, specials and valves shall be installed within 5 m of the plan position indicated on the approved drawings.

(d) Benchmarks and triangulation points

All levels shall be reduced levels above mean sea level and shall be indicated to the nearest 0,005 m. All coordinates shall be based on the applicable Lo system based on the WGS84 datum and shall be indicated to the nearest 0,1 m. Leveling shall be carried out to an accuracy such that the closing error between benchmarks does not exceed 0,007 times the square root of the distance traversed in kilometers.

PA 4.2.3 Setting-out of the Works shall also include the following duties which shall be performed and kept up to date as pipelaying progresses:

(a) Accurate determination of as-laid invert levels of the pipeline before backfilling commences.

(b) Accurate fixing by triangulation of all changes in direction before backfilling commences.

(c) Accurate determination of exact as-laid chainages of all specials, changes in direction and/or grade, valves, off-takes, structures, etc., taken along the pipeline before backfilling commences.

(d) The establishment of permanent surface benchmarks along the pipeline route at intervals not exceeding two kilometers and accurate levelling of same. Benchmarks to be sited within the pipeline servitude width as indicated on the drawings.

(e) The establishment of permanent surface triangulation points along the pipeline route at intervals not exceeding 5 kilometers and determination of co-ordinates of same. Triangulation points to be sited within the pipeline servitude width as indicated on the drawings.

PA 4.2.4 Levels and co-ordinates over any section of pipeline backfilled shall be made available to the Engineer on request at no extra costs.

PA 4.2.5 The Contractor shall carefully protect and preserve all benchmarks, sight rails, pegs and other reference marks used in setting out the Works. The checking of any setting out or of any line or level by the Engineer or his representative on site shall not relieve the Contractor of his responsibility for the correctness thereof.

PA 4.2.6 If at any time during the progress of the Works, any error shall appear or arise in the position, levels, dimensions or alignment of the Works, the Contractor, on being required to do so by the Engineer, shall at his own expense rectify such error to the satisfaction of the Engineer.

PA 5. ENTRY AND WORK UPON LAND

PA 5.1 GENERAL

PA 5.1.1 The servitudes available for the construction of pipelines, provides the Employer with a right of way but not ownership of the ground.

PA 5.1.2 Servitudes shall normally not be permanently fenced off except where indicated to the contrary in the Project Specification to the Contract.

PA 5.1.3 The Contractor shall confine his activities to the servitude strip except where otherwise provided for. Trespassing, poaching of game and gathering of firewood on property outside the servitude strip shall be strictly forbidden.

PA 5.1.4 All damage caused by the Contractor, his staff or agents outside the servitude strip shall be the responsibility of the Contractor who shall be liable for all claims in this respect.

PA 5.1.5 Provision has been made for the Contractor and the Employer to gain access from public roads to the pipeline servitudes via separate servitudes of access. These are shown on the drawings. The use of any other private roads to gain access to the pipeline servitude shall only be with the prior written approval of the landowner(s). The Contractor shall be responsible for all claims from the landowner(s) arising out of any such agreement. A Copy of each agreement must be submitted to the Engineer.

PA 5.1.6 The issue of the Final Certificate in terms of the General Conditions of Contract shall be subject to the Contractor producing to the Engineer a certificate, signed by the landowner or lessee in question that all the Contractor's obligations to him have been completely discharged in terms of any agreements that may have been arranged between the Contractor and the landowner or lessee or in respect of any damage to crops, land or property caused by the Contractor's activities outside the strip of right-of-way. If such certificates are not produced within 12 months after issue of the Completion Certificates in respect of the works or any part of the works, the Employer reserves the right to investigate any agreements entered into between the landowner or lessee in question and the Contractor and any claim made by the landowner or lessee for damage outside the strip of right-of-way. If the Employer is satisfied that the Contractor is in default in terms of the contract and any private agreements which he has made, all justifiable claims shall be paid to the landowner or lessee by the Employer from retention money held and deducted from amount payable to the Contractor.

PA 5.2 ENTRY UPON PRIVATE LAND

PA 5.2.1 At least 7 days written notice shall be given by the Contractor to the Engineer before entering upon any land to commence construction. The Engineer will, as far as possible, arrange a meeting between the Engineer, the Contractor and the landowner or occupier to inform the landowner or occupier of the programme of construction, to make an agreed record of the state of the land and any crops and/or improvements within the required right of way and to consider any special or reasonable requests of the landowner or occupier.

PA 5.3 WORK IN TOWNS AND ON AREAS UNDER CONTROL OF AUTHORITIES

PA 5.3.1 Where the pipeline crosses through towns or areas controlled by the Government, Provincial or local Authorities, Public or Semi-Government Corporations or Mine Owners, the work shall be carried out in accordance with the reasonable requirements of the authorities or owners where these do not contradict the provisions of the contract.

PA 5.3.2 Before undertaking any work in these areas, the Contractor shall contact the authority or owner concerned at least 14 days before commencement of construction, inspect the route in detail and familiarize himself with the requirements of the authority or owner in respect of working hours and working conditions. No additional payment or relief from his obligations in terms of the contract will be made on account of restriction imposed by the authorities or owners.

PA 5.3.3 Construction of the pipeline in any controlled area shall not be started without the written advice to the authorities or owners concerned that work is about to commence. No felling of trees, removal of crops or demolishing of buildings or other structures shall be undertaken without the approval of the authorities or owners.

PA 5.4 ACCESS THROUGH FENCES

PA 5.4.1 Where existing fences cross the pipeline route, the fences within the working area shall be replaced with fences and gates using new material throughout as hereinafter specified.

PA 5.4.2 Before any fence is cut, the Contractor shall erect straining posts of either 100 mm nominal bore steel tubing or 10 kg/m iron rail or creosote impregnated hardwood of 150 mm minimum diameter in the line of the fence on both sides of the pipeline to the working width required. The post shall be firmly concreted into the ground and shall be properly strutted or stayed to the satisfaction of the Engineer. The type of posts and stays or struts used shall depend on the climatic and soil conditions at the site and the Contractor shall be guided in his choice of materials by the type of fencing material generally in use in the area.

PA 5.4.3 As soon as the concrete has hardened sufficiently to take the strain, the wire strands of the existing fence shall be cut one by one, and each individually secured to the straining posts before proceeding to cut further strands so that the tension in the existing fences is maintained.

PA 5.4.4 The Contractor shall immediately erect and maintain temporary fences and gates between straining posts to the same general standard as the existing fence and in a manner that will ensure easy access along the pipeline route for the Contractor, the Engineer or his authorized Representatives.

PA 5.4.5 As soon as construction work has been completed in the vicinity of the temporary fence and gate, a permanent fence and a gate to the standards hereinafter specified shall be erected across the pipeline servitude. Permanent gates shall be provided with a heavy chain and padlock of approved quality. All padlocks shall be similar with duplicate sets of master keys provided. The sets of keys shall be handed over to the Engineer prior to the issue of the Completion Certificate in respect of that section of pipeline.

PA 5.4.6 From the time of occupancy of the site until the issue of the Completion Certificate the Contractor shall take all measures for the protection and control of livestock etc., which are made necessary by his operations. Livestock shall not be allowed to stray through severed fences or gates provided by the Contractor. If the random movement of stock through any such openings is not effectively prevented at all times, the Engineer

shall call upon the Contractor to provide a full-time guard at the Contractor's expense.

PA 5.5 TEMPORARY FENCING OF WORKING AREAS

PA 5.5.1 Where demanded by owners or instructed by the Engineer, the Contractor shall fence one or both sides of the pipeline servitude as may be required to prevent straying of livestock onto the working area during the entire period that excavations are open.

PA 5.5.2 It shall be incumbent on the Contractor to establish the needs of temporary fencing.

PA 5.5.3 Temporary fencing shall be of a standard as hereinafter specified and shall be maintained to the satisfaction of the Engineer and shall be removed only when in the opinion of the Engineer, the Site is deemed to be safe for livestock.

PA 5.5.4 The Contractor shall supply, install, and maintain gates of the standard hereinafter specified at such points as instructed by the Engineer or reasonably required by occupiers or owners of property for access across the working area or to parts of the farm severed by temporary fences.

PA 5.6 INTERFERENCE WITH AND REINSTATEMENT OF EXISTING SERVICES AND WORKS

PA 5.6.1 The Engineer will supply the Contractor with such information as he has, concerning obstructions and services which cross the pipeline route. Whilst such information is given in good faith, it shall not relieve the Contractor of any of his liabilities, obligations, and risks under the contract.

PA 5.6.2 Before commencing any excavation or pipework, the Contractor shall verify the locations and elevations of all known or suspected service and utility installations such as power transmission lines or cables, telephone lines or cables, water and sewer pipes, access roads, tracks or paths, irrigation or stormbulk water pipeline, agricultural contours, natural drainage channels, lamps or other posts or pylons and any other service or obstacle, whether those be buried, under water or not. Verification shall be by inspection of the site, examination of drawings, consultation with landowners, occupiers, and responsible authorities or, where necessary, by the excavation of trial holes.

PA 5.6.3 The Contractor shall be responsible for the cost of immediate repair of any damage caused to services or utility installations and for any loss or damages suffered because of the interruption of any service so damaged whether or not such damage is attributable to negligence on his part. Any damage caused shall immediately be reported to the Engineer.

PA 5.6.4 The Contractor shall not interfere with any service or utility installation without written approval of the owner, occupier or responsible authority. The Contractor shall arrange for the temporary continuance of any service or utility installation which must be discontinued, disconnected, deviated, or removed for the purpose of construction and for the maintenance of such temporary measures until final restoration of the service or utility installation. The provision of the temporary measures shall be carried out in such a manner as may be required by the authority or owner concerned or as directed by the Engineer.

PA 5.6.5 The Contractor shall send all requisite notices to the authorities or persons concerned and shall make the necessary arrangements for the maintenance, discontinuance, disconnection, or removal of the said installations.

PA 5.6.6 In the case of temporary discontinuance of services, the Contractor shall warn owners, occupants or responsible authorities of the impending interference with the service and co-operate with them in order to carry out the work with as little disruption of the owners', occupants' or local authority's operations as possible and whatever temporary arrangements are required to maintain the service in operation during alterations shall be carried out by the Contractor.

PA 5.6.7 As soon as possible, all service and utility installations that have been interfered with, shall be restored to the condition they were in before the start of construction under this contract, or better, but to the satisfaction of the Engineer.

PA 6. SITE PREPARATION

PA 6.1 SITE CLEARING

PA 6.1.1 Prior to commencing excavation the Contractor shall clear the full width of the permanent pipeline servitude of al bush, trees, scrub, rubble, boulders etc. and shall where specifically indicated in the Schedule of Quantities, demolish permanent structures, huts, houses etc. situated within the permanent pipeline servitude.

PA 6.1.2 All bush, scrub and trees shall be cut down and all stumps and roots completely removed. Grass however shall not be removed indiscriminately as this would render the servitude liable to erosion. Combustible material removed may be burnt within the servitude, provided care is taken to prevent contamination of trench bottoms or backfill material with charcoal or other products of combustion and safeguards against veldt fires are taken to the satisfaction of the Engineer or landowner.

PA 6.1.3 The Engineer may direct that certain trees not within 3 meters of the pipeline and which would not interfere with construction, be left standing and the Contractor shall therefore obtain the Engineer's instruction before removing trees which could reasonably be left standing. All timber removed remains the property of the Employer and the Contractor shall dispose of timber in a manner as instructed by the Engineer.

PA 6.2 TOPSOIL

Topsoil shall be carefully stripped over the trench width, set aside for bringing back after backfilling of trenches and replacing over the top of trenches to restore the ground to its near as possible original condition.

PA 6.3 GENERAL LEVELLING

PA 6.3.1 If, owing to excessive cross-falls, the Contractor requires to carry out general leveling within the servitude strip to facilitate use of plant, such leveling may only be carried out after stripping and setting aside of topsoil over the full width of the area to be leveled.

PA 6.3.2 After completion of the works, the ground shall, at the discretion of the Engineer be restored to its original contour, topsoil replaced to its original depth and the area protected against erosion to the satisfaction of the Engineer.

PA 7. EARTHWORKS

PA 7.1 EXCAVATIONS

PA 7.1.1 General requirements

All excavation work shall be subjected to the requirements of the Occupational Health and Safety Act (Act 85 of 1993 and amendments). The Contractor shall ensure that working conditions are safe and that excavations are kept free of water at all times.

The transport, storage, handling, and use of explosives shall be in accordance with the Explosives Act and Regulations Act 15 of 2003 and amendments). Blasting shall not be carried out without the approval of the Engineer. Such approval shall not relieve the Contractor of any of his liabilities, obligations or risks under the Act or the Contract. Proper precautions shall be taken to protect persons, the works and the property and the Engineer may instruct the use of blasting mats at the Contractor's expense over any or all sections of excavations, whether in open country or otherwise. The Contractor shall collect fly rock, if any, immediately after each blast. Blasting may be prohibited where, in the opinion of the Engineer, injury to persons and/or damage to property and/or service and utility installations is likely.

When blasting within 500 meters of any permanent structure, above or below ground, including pipelines, buildings etc. described in clause 10.17.1 and 10.17.2 of the Explosives Regulations no. 1604 of the Explosives Act no. 26 of 1956 the peak particle velocity as defined in a technical bulletin "Explosive Today" no. 27, March 1982 of AECI, shall at no stage exceed 25 mm/s adjacent to any of these structures. These peak particle velocities shall be measured by an approved Vibro recorder and Peak Particle Velocity meter for each blast over the full length of work which falls within the above limits.

PA 7.1.2 Classification of excavated materials PA 7.1.2.1 General

Materials shall be classified with sub-classifications of "soft and pickable" and "rock".

PA 7.1.2.2 Classified materials

The Engineer's decision as to in which sub-classification excavated materials fall, shall be final.

PA 7.1.2.2.1 “Soft and Pickable”. This sub-classification shall include all topsoil, sand, loam, clay, gravel, pickable materials, ouklip (laterite), shattered or loose rock, decomposed or partially decomposed rock and all other materials which can be removed with mechanical equipment or by pick and shovel, whether this be by lifting hard layers from underneath or otherwise. Boulders under 0,15 cubic meter in volume are included. The fact that blasting or pneumatic percussion tools or other rock breaking equipment may be a faster or more convenient method of excavating material under this sub-classification shall not entitle the Contractor to claim payment for "rock" excavation.

PA 7.1.2.2.2 "Rock". This sub-classification shall include all solid undecomposed rock, the practical excavation of which necessitates the use of explosives, rock splitting equipment or pneumatic pavement breakers and rock drills. All boulders larger than 0,15 cubic meter in volume are included.

PA 7.1.3 Trenches

PA 7.1.3.1 Trench widths

PA 7.1.3.1.1 Minimum trench widths shall generally be as follows:

PIPE NOMINAL BORE IN mm	WIDTH OF TRENCH IN mm
100	700
150	700
200	800
400	1 000
500	1 100
600	1 200

Widths of trenches shall be maintained at the base of the trench and the laid pipeline shall be located centrally in the trench to enable backfill to be effectively rammed below the lower half of the pipe on both sides of the pipe.

PA 7.1.3.1.2 At tie-ins on welded pipelines, trenches shall be excavated to a width of not less than 900 mm in excess of the minimum widths, to a depth of not less than 750 mm below pipe invert level and for a length of not less than 900 mm centred on the joint. For pipelines with flexible joints, sufficient space shall be allowed around joints to permit proper making and inspection of joints.

PA 7.1.3.2 Trench depth

PA 7.1.3.2.1 General

The contractor shall set out the trench accurately in accordance with the drawings.

Before commencing the setting out the contractor shall clear and roughly grade the surface over the full width of the trench.

The contractor shall provide, erect, set to line and level and maintain approved substantial profiles along the length of the trench at a maximum of 50 m intervals and at changes of grade and direction. Each profile shall be fitted with a horizontal crossbar set at a predetermined height above the designed bed-level of the pipe and have setting marks which will define the centreline of the trench. Where required by the engineer the contractor shall provide a profile with the crossbar extending across the full width of the trench. A profile shall remain in position during all stages of the trench excavation and the trench floor and pipe bed preparation and until the pipe is laid past the profile.

The contractor shall provide sets of boning rods, templates, and piano wire, for the sole use of the engineer, for checking the level, grade and width of the trench relative to the centreline. The contractor shall also provide, set, and level all the pegs required to transfer lines and levels to the pipe bed to control the preparation of the trench floor and pipe bed.

Should the contractor prefer to make use of other setting-out techniques for maintaining the correct line and grade of the trench full details of his proposed technique shall be submitted to the engineer for approval.

Trenches shall be excavated to the grades and levels shown on the approved drawings and depths shall be so controlled that a uniform depth of bedding underneath the pipeline is ensured.

The contractor shall maintain correct line and grade throughout the work. Precise control of the grade of the trench floor and pipe bed is required, and the contractor shall compute the pipe bed levels at each

pipe joint position and install a level peg at the position of each joint and each change of grade to enable the pipe to be installed in accordance with the levels and grades shown on the relevant longitudinal section. The accuracy of the computation of and transfer of levels from the levelled pegs at the trench side to those installed by the contractor to establish the pipe bed shall be within 3 mm of the correct level. The competent person appointed by the contractor shall be fully experienced and competent in the use of engineering surveying equipment and techniques.

PA 7.1.3.2.2 Trench floor

PA 7.1.3.2.2.1 The trench floor or bottom is defined as the plane at which the bulk excavation is terminated.

The contractor shall apply for and obtain from the engineer instructions regarding the position of the trench floor relative to the pipe bed level stated on the longitudinal section for the pipeline, for each type of material and at each change in material.

Trenches shall be excavated and trimmed to a depth of not less than 100 mm below the underside of pipes in the case of welded or coupled steel pipelines and not less than 200 mm below the underside of pipes in the case of flanged steel pipes in excess of pipe barrel outside diameters. These depths shall be maintained for the full width and length of the trench and all stones, rocks or other projections trimmed accordingly.

The levels and grades of the finished trench floor shall not be more than 0 mm above or more than 50 mm below the prescribed position.

Where, in the opinion of the engineer, the in-situ material at the levels and grades of the pipe bed has inadequate bearing capacity, the contractor shall deepen the trench below the stated pipe bed level. The amount of deepening will be prescribed by the engineer after inspection of the trench floor as the excavation proceeds.

The contractor shall terminate the bulk excavation at the stated pipe bed level where the in-situ material at the pipe bed level stated on the longitudinal section has adequate bearing capacity, is composed mainly of fine, sandy or clayey-sand material with a plasticity index not exceeding 15, is free from ouklip or substances chemically deleterious to bitumen coated steel pipes and is free from pebbles, stones and fragments of shattered rock with maximum dimensions exceeding 10 mm.

PA 7.1.3.2.2.2 The Contractor shall advise the Engineer whenever trench bottoms have been excavated and trimmed and are ready for inspection. No trench bottoms shall be covered with bedding material or pipes laid until the inspection has been carried out and the trench bottoms passed. Failure of the Contractor to comply with this clause shall render the Contractor liable to re-open, uncover and reinstate trench bottoms for inspection at the Contractor's expense.

PA 7.1.3.2.2.3 The engineer reserves to himself the right to increase the depth of the trench below the pipe bed as shown on the drawings and to pay for such extra depth at tendered rates for excavation.

The contractor shall extend the bulk excavation to a depth of 150 mm below the stated pipe bed level where the in-situ material at the levels and grades of the pipe bed has adequate bearing capacity but consists of rock, hard rock, ouklip, clay with a plasticity index exceeding fifteen, coarse broken material with pebbles, stones and fragments of shattered rock with maximum dimensions exceeding 10 mm, or contains ouklip or substances chemically deleterious to bitumen coated steel pipes.

PA 7.1.3.2.2.4 To comply with the regulations promulgated under the Machinery and Occupational Safety Act (Act 6 of 1983) it may be necessary to either batter the trenches to the angle of repose of the in-situ material or to shore the sides of the trench.

PA 7.1.3.3 Overbreak and over excavation

It is to be expected that during the bulk excavation material will be removed from below the prescribed trench floor position. In the cases where the trench floor is formed of materials classified as hard material, the additional depth will for purposes of this contract be termed overbreak and can be expected to vary according to the nature of the rock, the jointing planes, the extent of weathering of the rock, the methods and procedures used in the blasting of the rock and the expertise of the personnel undertaking the blasting. In the case where the trench floor is formed in materials classified as soft material, the additional depth will for purposes of the contract be termed over excavation.
There will be no direct payment for the cost of removing and disposing of the volume of material removed from below the prescribed trench floor position or for the cost of rebuilding overbreak and over excavation to the prescribed trench floor position. The cost of all these operations shall be included in the tendered rates for preparing the trench floor to receive the pipe bed as set out in sub clauses PA 7.1.3.4 and PA 7.1.3.5.

PA 7.1.3.4 Cleaning the trench floor

Before placing a filling layer on the trench floor, the contractor shall loosen any disturbed material and shattered rock and shall remove all rubble, mud and standing water. Before a subsequent filling layer is placed the contractor shall remove any loose material, rubble, mud and standing water from the interface between the layers.

PA 7.1.3.5 Rebuilding the trench floor

Rebuilding the trench floor is defined as all operations necessary to replace material removed in overbreak and over excavation and to restore the trench floor to the levels and grades prescribed by the engineer.

In overbreak the exposed surface of the rock at the bottom of the trench shall be cleaned in accordance with subclause PA 7.1.3.4 and the average depth of the overbreak below the prescribed trench floor position shall be assessed in order to determine the number of fill layers needed to rebuild to the prescribed position. Not more than 20% of the area of the trench floor in each 20 m length of trench shall contain unexcavated rock with an upper surface located within 150 mm to 100 mm of the pipe bed level and no material whatever shall project to within less than 100 mm of the pipe bed level.

The overbreak shall be backfilled to the prescribed trench floor position to within the specified tolerances using cement or lime stabilized fill.

In over excavation the undisturbed surface of the in-situ material at the bottom of the trench shall be cleaned in accordance with subclause PA 7.1.3.4 and the average depth of the over excavation below the prescribed trench floor position shall be assessed in order to determine the number of filling layers needed to rebuild to the prescribed position. No undisturbed material shall project above the prescribed position of the trench floor.

The over excavation shall be backfilled to the prescribed trench floor position to within the specified tolerances using cement or lime stabilized fill.

PA 7.1.3.6 Progress of trenching

Trench excavation shall proceed progressively from each working head and the opening of trenches haphazardly at various points along the route will not be permitted without approval of the Engineer. In particular, the Contractor will not be allowed to pass over hard sections of excavations to proceed with soft excavation at further points along the trench. Trench excavations shall not be carried out further ahead of pipe laying than is required for efficient working and in no case shall this exceed 1 kilometer without prior approval of the Engineer. At the discretion of the Engineer this clause may be relaxed insofar as road and stream crossings are concerned. Where rock excavation is continuous, the Contractor may be permitted at the Engineer's discretion to use special rock excavating gangs further ahead of the main excavating gangs.

PA 7.1.4 Valve chambers and thrust blocks

Where instructed or shown on the drawings, excavation which is of a greater width or depth than the prescribed dimensions for the trench excavation or sundry additional excavation of any nature shall be carried out by the contractor to the engineer's instructions. Such additional excavation shall include widening and deepening the normal pipe trench for valve chambers, thrust blocks and other structures and for excavations ordered by the engineer including joint holes and sling slots. Such additional excavations shall be carried out as and when required by the engineer. Only that portion of the authorized excavations in excess of the prescribed dimensions for the trench shall be paid for as additional excavations, inclusive of a maximum working space of 700mm for erecting and removal of shuttering.

Additional excavation will be required to expose existing Magalies Water pipelines to allow the installation of connections to the new pipeline. In exposing existing pipelines, the contractor shall excavate by machine, or by hand if necessary, around and under the pipelines taking care to avoid damage to pipe coatings. Any damage caused to the pipe or pipe coatings during excavations shall be made good by the contractor at his own expense.

PA 7.1.5 Joint holes and sling slots

Before the pipes are laid, joint holes and lifting sling slots shall be excavated where required to facilitate efficient welding, inspection and repair of joints and removal of slings. The dimensions of joint holes and sling slots shall be left to the discretion of the Contractor, but the Engineer shall reserve the right to order an increase in the dimensions should the quality of the work suffer as result of inadequate workspace. This work shall be carried out as directed and shall be completed well in advance of the pipe-laying. The cost of excavation and subsequent backfill of joint holes and sling slots shall be deemed to be included in the rates tendered for excavation, backfill and placement of bedding.

PA 7.1.6 Spoil dumps

All excavated material shall be dumped along the sides of trenches either separately or in successive layers according to the nature of the material removed in such a way that backfilling in accordance with the specification may be facilitated. Spoil dumps shall not unreasonably obstruct the works, traffic or drainage, and all surplus spoil not required for backfilling and restoration shall be removed to spoil dumps during the progress of the work.

PA 7.1.7 Safety of trench and other excavations

The contractor shall include in his tendered rates for excavation, the cost of all necessary timbering and shoring of the sides of the trench and the protection and separation of the trench from access by the public, livestock, etc. Timbering shall consist of open planking, walling and substantial struts and shall be carried out in a workmanlike manner and to the satisfaction of the engineer.

The shoring method adopted shall be compatible with the excavating, backfilling, and pipe-laying methods and shall cause minimum restrictions to the laying of the pipes. Shores shall be designed to withstand the earth pressures exerted upon them from the trench side, which shall include the superimposed loading of pipe-laying equipment working at the side of the trench with pipes.

The engineer may call upon the contractor to timber the sides of the trench at any point that he may consider in any way dangerous. Such timbering shall be left until after the completion of the pipe-laying at the point affected.

The contractor shall carry out the removal of timbering immediately prior to backfilling or on the instructions of the engineer.

As an alternative to timbering, the contractor may prefer to batter the sides of the trench or form suitable steps to ensure the safety of the excavations in accordance with the regulations promulgated under the Factories, Machinery and Building Works Act, 1941, as amended, and the Machinery and Occupational Safety Act (Act 6 of 1983).

Maintaining the sides of the trench in a safe condition during excavations, preparation of trench floor, delivery of pipes to site, placing of pipe bed, laying of pipes, backfilling, and the protection of the trench together with preventing general access to the trench by unauthorized persons, by children and by animals shall be the sole responsibility of the contractor. No undercutting of the sides of the trench will be allowed.

The contractor shall take every precaution to prevent water from any source entering the trench. The engineer may order additional precautions to be taken where he is not satisfied with the contractor's arrangements. Any water, including seepage, entering the trench shall be removed immediately if directed by the engineer.

If required by the engineer, the contractor shall leave unexcavated blocks in the trench to prevent the flow of stormwater down the trench. These blocks shall be at least 1,0 m thick and at spaces as directed by the engineer.

PA 7.1.8 Maintenance of open trench

After excavation the trench and pipe bed shall be maintained until the pipe is laid. Should the sides fall in or any debris or water accumulate in the trench due to any cause, the trench shall be cleared and the bed made good where so directed by the engineer. After the installation of the pipe, the trench shall be maintained until the backfilling has been completed.

PA 7.2 BACKFILLING

PA 7.2.1 General

PA 7.2.1.1 The Contractor shall negotiate directly with landowners or lessees regarding borrow pits for padding or selected backfill material. All such sites shall be subject to the approval of the Engineer.

The Engineer shall be kept fully informed of all negotiations that are in progress between the Contractor and the landowners or lessees. It is essential that the Contractor shall make prompt payment to landowners or lessees for any royalties for borrow pits and for any agreed amounts to be paid to the landowners or lessees for the use of borrow pits, access roads, use of ground outside servitudes etc.

PA 7.2.1.2 It is desirable that trenches shall be backfilled as soon as possible after pipe laying to curtail thermal movements of the pipeline, damage to coatings and flotation of the pipeline should the trench fill with water. At no time shall backfilling lag more than 500 meters behind the last pipe laid. All specified tests on pipe barrels and joints shall therefore be carried out as soon as possible.

PA 7.2.1.3 The Contractor may use his discretion as whether to backfill around joints before the pipeline is hydrostatically tested. The Contractor shall be responsible for the location and repair of any leaks on the pipeline under hydrostatic test and no extra payment will be made for any re-excavation and subsequent reinstatement which may be necessary to locate and remedy leaks or for the installation of cathodic protection equipment. Should the Contractor elect to leave joint holes open until after the hydrostatic test, he shall provide at his own expense effective and approved barricades and fences around each hole for the protection of persons and animals. In built-up areas, barricades shall be clearly marked at nighttime with warning lights.

PA 7.2.2 Pipe bedding

PA 7.2.2.1 Pipe bedding comprises backfill placed and compacted in trench bottoms up to the level of pipe springing points in a manner such that pipes are uniformly supported over an arc of 120°, centered on the pipe centerline for its full length.

PA 7.2.2.2 Placing and compaction of the pipe bedding shall be regarded as the most critical phase of the backfilling operation. Backfilling beyond this point shall only proceed after inspection and approval of the completed bedding by the Engineer.

PA 7.2.2.3 As soon as possible after trench bottoms have been passed by the Engineer, cross berms of compacted bedding material shall be placed over the full width of the trench and of a size and spacing such that the pipe shall be supported at the required level and grade without interference with the placement and compaction of the balance of the bedding material. This phase of the operation shall be subject to the Engineer's approval and the Contractor shall submit a comprehensive method statement to the Engineer for

perusal and approval before pipe laying commences.

PA 7.2.2.4 Bedding material shall be placed and compacted evenly on both sides of the pipe, compaction to be by hand or mechanical tamping or the bedding may be placed by puddling and compaction by means of poker vibrators. The method adopted shall be subject to the Engineer's approval. Whatever method is adopted and approved, great care shall be exercised at all times to prevent damage to pipe coatings or disturbance of the pipe level and grade by flotation or otherwise. The top of the completed bedding shall form a level surface completely filling the space between the pipe and trench walls including any cavities that might exist in the trench walls.

PA 7.2.2.5 If compaction is by hand or mechanical tamping, compaction shall be in layers not exceeding 100 mm measured in the loose, watered to optimum moisture content and compacted to densities as per Clause 7.2.6. The material in the "wedges" formed by the curvature of pipe bottoms shall be compacted by hand punning horizontally and obliquely.

PA 7.2.2.6 After completion of a length of pipe bed and its approval by the engineer, the contractor shall carry out the excavation of the joint holes and pipe lifting sling slots and clean the surface of the pipe bed.

The trench shall not be considered complete for pipe-laying purposes until the pipe bed, joint holes and pipe lifting sling slots have been constructed by the contractor and accepted by the engineer.

PA 7.2.3 Soft trench bottoms

PA 7.2.3.1 Where trench bottoms are too soft and waterlogged to permit placement and compaction of bedding material in the normal manner, such trench bottoms shall be excavated to a depth of at least 300 mm below the underside of pipes and specials for the full width and length of the trench affected.

PA 7.2.3.2 The full width and length of the trench bottom and at least 500 mm height of both sides of trench walls shall be covered by "Bidim" or similar approved filter cloth.

PA 7.2.3.3 The full width and length of the trench shall thereupon be covered by a 300 mm thick layer of coarse gravel, coarse sand, or 19 mm nominal size crushed stone, fully compacted within the confines of the filter cloth to take the mass of the pipe filled with water and all loads on the pipe without settlement.

PA 7.2.3.4 The free drainage layer shall be covered over the full width of the trench by a single layer of filter cloth with the cloth on trench walls folded over and overlapping to completely seal off the drainage layer against ingress of sand or fine soil particles.

PA 7.2.3.5 Pipes shall be laid directly on the bed prepared as above and pipe bedding and selected backfill completed as specified.

PA 7.2.4 Selected backfill

PA 7.2.4.1 Selected backfill comprises backfill material placed and compacted in trenches from the top level of completed beddings up to a level of 300 mm above the crown of pipes.

PA 7.2.4.2 As soon as possible after completed beddings have been inspected and accepted by the Engineer, selected backfill shall be placed and compacted evenly on both sides of the pipe, compaction to be by pneumatic

rammers or vibratory rollers or may be placed as a hydraulic fill and compacted by poker vibrators. The method adopted shall be subject to the Engineer's approval. Whatever method is adopted and approved, great care shall be exercised at all times to prevent damage to pipe coatings or disturbance of the pipe level or grade by flotation or otherwise.

PA 7.2.4.3 If compaction is by pneumatic rammers or vibratory rollers, compaction shall be in layers not exceeding 150 mm in the loose, watered to optimum moisture content and compacted to densities as per Clause PA 7.2.6.

PA 7.2.4.4 The top surface of the completed selected backfill shall be level over the full width and length of the trench. The compacted selected backfill shall completely fill all spaces between the pipe and trench walls, including any cavities that might exist in trench walls.

PA 7.2.4.5 If selected backfill of the required properties is not available for coated steel pipelines, approved "blanket-type" rock-shield having a close fit around the pipe shall be used subject to the Engineer's approval. The rock-shield shall at least be 1,0 mm thick and of the Type D wrap specified in SABS 1117. A selected backfill consisting of material passing a 75 mm screen but not less than 60 % by mass passing a 9,5 mm screen, may be utilized in conjunction with the rock-shield, provided the required degree of compaction is maintained.

PA 7.2.4.6 If selected backfill of the required grading is available, but which exceeds the specified requirements in respect of linear shrinkage, coated steel pipes shall with the approval of the Engineer, be protected with a close-fitting blanket or a spirally wrapped tape with thirty percent overlap of polyethylene of at least 500 micrometers thickness conforming to the requirements of SABS 1117, Type D wrap.

PA 7.2.5 Common backfill

PA 7.2.5.1 After completion of backfilling with selected backfill material, the remaining trench depth shall be filled with selected "common ground" originally excavated from the trench and with all rocks or boulders exceeding 150 mm nominal size excluded. The backfill shall be placed in the trench in layers not exceeding two hundred (200) mm measured in loose and each layer compacted sufficiently to prevent later settlement. The trench shall be filled to the level to which the topsoil was originally separately removed. The top of the trench shall then be completely filled with the topsoil and compacted up to the original ground level. The top of the trench may be mounded to 150 mm to provide for settlement, provided natural drainage of the ground is not interfered with.

PA 7.2.5.2 Where backfilling is carried out by mechanical plant such as bulldozers, the method of working shall be subject to the Engineer's approval. Heavy plant and equipment shall not be allowed to travel along or across the trench.

Suitable material for backfill shall be moved from any part of the works where there is a surplus to any part where there is deficiency or shall be imported from borrow areas.

PA 7.2.5.3 As soon as trench backfilling has been completed over any portion of the pipeline all surplus materials and rubbish shall be removed from the site to a dumping site, approved by the Engineer.

Where spoil is to be moved outside the free-haul distance, the Engineer's authority in writing must be obtained.

PA 7.2.5.4 Precautions shall be taken to ensure that the natural drainage of the ground is not interfered with, especially where final backfill is left mounded and all necessary cross drains shall be constructed, and agricultural drainage berms and contours reinstated as backfilling progresses. Care shall be taken to prevent erosion of backfilling by construction of the necessary diversion banks and drains.

PA 7.2.5.5 The Contractor shall be responsible for settlement of backfill and erosion of the site up to the time the contract maintenance period has expired, and he shall fill and level any settlement and/or erosion from time to time, as required by the Engineer and at the Contractor's expense.

PA 7.2.6 Compaction

PA 7.2.6.1 Where compaction of bedding material or selected backfill is specified, such compaction shall be to a density of at least 93 % of the Modified AASHTO maximum dry density. The Contractor shall determine the maximum Modified AASHTO dry density for every type of material used by taking representative samples from borrow areas.

PA 7.2.6.2 The Contractor shall control the field compaction densities with a fully registered nuclear surface moisture- density gauge which is in a proper working order. This density gauge with operator shall be made available to the Engineer for his use if and when required.

PA 7.2.7 Cleaning of pipeline servitude

PA 7.2.7.1 As soon as possible after the common backfilling has been completed, the Contractor shall clean the pipeline servitude of all surplus materials and rubbish. The cleaning of the servitude shall not lag behind the pipe laying operation more than 3 000 meters. Should this happen the Engineer reserves the right to stop the pipe laying operation.

PA 8. LAYING AND JOINTING OF PIPES AND SPECIALS

PA 8.1 GENERAL

PA 8.1.1 Pipelines shall be laid to straight grades between vertical bends and shall be, within the specified tolerances, to the routes and levels indicated on the approved working drawings.

PA 8.1.2 Pipes shall be laid free from cold stresses. No deflections shall be taken in curvature of pipes but shall be taken with approved prefabricated bends with exceptions as hereinafter specified.

PA 8.1.3 All deflections under 6° of the axis of pipelines with flexible joints may be made by spreading the deflection over not less than 5 number of joints, provided always that the deflection in any one joint does not exceed t hose recommended by the manufacturer of the joint after allowance for pipe settlement, heave or other ground or pipe movements.

PA 8.1.4 All deflection in the axis of butt welded steel pipelines of under 15° or less shall be made by scarfing equally the ends of the two pipes to be joined so that the maximum scarf in any one pipe will be 7,5°. Where the total deflection is 4° or less, the scarfing may be made in one pipe end only. Ends to be scarfed shall be carefully and accurately marked and then be either machine cut, or machine planed. Hand planning shall not be permitted.

After scarfing, the pipe ends shall be re-chamfered as described in clause 4.15 of SABS 719. The minimum gap between pipe end root faces before welding shall be 1,5 mm and the maximum gap shall be 3,0 mm. After scarfing all pipe ends shall be thoroughly cleaned before the field weld is carried out.

PA 8.1.5 Except where otherwise provided for, the Contractor shall supply all bolts, nuts, washers, gaskets, and other jointing materials for complete installation of pipelines including all specials, fittings, valves, meters etc.

PA 8.1.6 The tolerances allowable for the installation of pipes and specials shall be the same as those laid down for the manufacture thereof.

PA 8.2 SPECIALS

PA 8.2.1 Fabrication

PA 8.2.1.1 All specials shall be fabricated, lined and coated where applicable, in the pipe suppliers works with all flanges and openings protected as specified.

PA 8.2.1.2 Except where otherwise approved by the Engineer in writing, the following field welding will be permitted; tie- ins, the attachment of flanges where the exact position and alignment of same are dependent on-site conditions e.g. closure pieces and branches for air and access tees. Scour valve tees shall, however, be manufactured in the factory, pre-aligned to the gradients as indicated on the drawings.

PA 8.2.2 Installation

PA 8.2.2.1 Bends

Bends shall be installed true to line, level and deflection and shall be anchored in concrete where required to counteract thrust. The faces of a thrust block shall be 300mm from the back of the flanges. Bends shall normally be supplied with "centre planes" marked with two small punch marks close to both ends of the bends to facilitate correct positioning of the bends in laying.

PA 8.2.2.2. Tees

Tees for air valves shall be installed with branch barrels vertical. Tees for scour valves shall be installed with branch barrels horizontal or at the gradients as indicated on the drawings. Tees for off-takes shall be installed as shown on the drawings.

PA 8.2.2.3 Flanges

All flanges shall be installed with bolt holes off-centre and symmetrically off-set from the vertical centre line of the flange. Flanges shall be installed truly square to the axis of the pipe.

PA 8.2.2.4 Insulated flanged joints

Insulated joints shall be provided and installed by the Contractor where specified or instructed by the Engineer. The Contractor shall supply all materials, labour and equipment and shall complete and prove that each insulated joint after installation in the pipeline has a resistance well in excess of the resistance to earth of the pipeline on both sides of the insulating joint.

PA 8.2.2.5 Dismantling joints

Dismantling joints shall be installed where indicated on the drawing or instructed by the Engineer. These will normally be provided to facilitate the removal of valves or similar fittings from the pipeline. The Contractor shall supply and install dismantling joints with due regard to their pressure rating and mating flanges. The hydraulic pressure restraining tie-bolts shall be carefully installed to tie the pipework across the dismantling joint. Dismantling joints shall be watertight.

PA 8.2.2.6 Thrust flanges

Where thrust flanges are to be installed on site as for anchoring pipes on steep slopes etc. these flanges shall be supplied by the Contractor split in two equal segments, undrilled with outer perimeter unmachined.

At the point of installation of the thrust flange the pipe coating shall be stripped of the pipe for a distance of 300 mm. The flange segments shall be double fillet welded to the pipe barrel around the full circumference and also along both sides of the split which shall be chamfered for welding. After welding, the coating and lining of the pipe shall be made good.

PA 8.2.2.7 Temporary closure pipes

Temporary closure pieces of the same standard, diameter and wall thickness as the pipeline shall normally be jointed with flanges and/or flexible couplings, except where otherwise specified or instructed by the Engineer.

PA 8.2.2.8 Minor connections and off-takes PA 8.2.2.8.1 General
Typical assemblies of complete minor off-takes are shown on the tender drawings, and these consist of branches fitted in the pipeline, stop cocks, pressure reducing and relief valves, constant discharge orifices, water meters and strainers and manholes around valves and meters, all in accordance with approved drawings.

PA 8.2.2.8.2 Steel pipelines

The Contractor shall strip an area of pipe coating of 300 x 300 mm. A hole of the required size shall then be cut through the pipe wall in the crown of the pipe and in the centre of the stripped area. A standard boss with female thread of the required size shall be welded over the hole onto the pipe surface using a full fillet weld along the boss perimeter. After removal of welding slag, weld spatter and all foreign matter, the coating and lining shall be made good. The connection shall be off set from any weld in the pipe barrel. Where the location of the boss in relation to pipe ends or access tees is such that it would be difficult to make good linings, a 200 mm nominal bore off-take tee with flange shall be welded onto the pipe barrel. The standard boss shall be provided on a blank flange and the assembly bolted onto the off-take tee.

PA 8.3 INSTALLATION OF VALVES AND METERS

PA 8.3.1 The mass of valves or meters shall at no time be carried by the pipe, the flange or the coupling and valve chamber floors shall preferably be cast complete with valve stools and supports immediately after the installation of valves and meters. Stools shall not be permitted to carry the mass of a valve until at least 7 days after casting the concrete. Alternatively, prefabrication and welding of pipe and valve supports shall comply with the requirements of SABS 044 Part III and shall be fabricated to the Engineer's approval. Supports shall be welded to pipe only where specified and linings of pipe and specials shall be made good after welding.

PA 8.3.2 Valves and meters requiring special adjustment after installation shall be adjusted and commissioned by the respective suppliers or agents after installation.

PA 8.3.3 Butterfly valves shall be installed with the blade seal retaining ring facing downstream.

PA 8.4 FIELD WELDING

PA 8.4.1 All field welding shall only be done by welders who satisfy the requirements of API 1104 and who have been tested at the Contractor's expense by an independent testing authority for this specific contract.

PA 8.4.2 Before any welding of pipeline materials commences, the qualification of welders shall have been approved, all detailed welding procedure specifications with weld diagrams required for their completion shall have been submitted for approval in a neat form, and the welding procedure qualification tests shall have been successfully concluded all in accordance with the relevant standard specifications.

Sufficient records shall be kept by the Contractor to ensure that all field welds can be subsequently identified with the welder concerned.

PA 8.4.3 No welding shall be carried out during rain or high wind or under dusty conditions unless the welder, the weld area and the weld are adequately protected and sheltered.

PA 8.4.4 Only welding rods which have been kept dry and uncontaminated shall be used.

PA 8.4.5 Welding rods shall be of a grade and quality such that the chemical composition of weld metal and parent metal is similar.

PA 8.5 STEEL PIPELINES

PA 8.5.1 General

The out of roundness at a plane perpendicular to the pipe axis at any point along the pipeline length shall not exceed 4 % the minimum as laid inside diameter (i.e. ± 2 % of the nominal internal diameter) after completion of the backfilling and with atmospheric pressure inside the pipe.

Out of roundness shall be measured as the difference between the minimum and maximum inside diameter of the pipe at a point.

PA 8.5.2 Butt welded pipelines

PA 8.5.2.1 Pipes and specials to be joined by field welding shall be supplied with ends bevelled for welding.

PA 8.5.2.2 Field welding of joints shall conform to API 1104.

PA 8.5.2.3 Before welding of joints shall be proceeded with, pipe ends shall be completely circular and properly mated up by means of an external line-up clamp. At least 4 tack welds equally spaced around the pipe perimeter shall be applied to maintain the root gap and position of the pipe for completion of welding. A protective plastic or rubber sheet shall furthermore be placed over the coating adjacent to the joints to protect same from damage caused by welding spatter.

PA 8.5.2.4 Root welds shall thereafter be carried out followed by successive filler passes, and capper passes, all in accordance with the approved welding procedure. Wherever it is possible to have entry into a pipe, inside welds shall also be applied. The inner weld bead shall not extend more than 1 mm into the bore of a pipe or special.

PA 8.5.2.5 Horizontal weld seams or spiral weld seams at pipe ends shall be placed near the horizontal diameter of the pipe or special and shall be staggered so that the circumferential distance between longitudinal or spiral welds intersecting the same circumferential butt weld, is not less than 90 mm nor more than 130 mm apart.

PA 8.5.2.6 Defects caused by stray welding arc flashes, weld spatter etc. shall be removed by grinding provided that pipe wall thicknesses are not reduced to less than the specified minimum thicknesses, otherwise the portion containing the defect shall be cut out and repaired.

PA 8.5.2.7 During welding of pipes with organic linings, mats of thick rubber felt or other suitable material shall be placed along the pipe invert to protect the pipe lining for the full distance from the point of access up to the point of weld or weld inspection. The mats shall be of sufficient width and shall cover a sufficiently wide area of pipe invert to protect the lining against damage due to access by staff, equipment, and inspectors or fall out from arc weld. Workmen shall wear soft rubber soled shoes before entering lined pipes.

PA 8.5.2.8 Care shall be taken not to stroke arcs on epoxy lined areas and protective tapes, if any, at ends of epoxy lined pipes.

PA 8.5.2.9 Pipes may be welded together alongside the edge of the trench. For factory lined and coated pipes, the maximum length so welded together shall be such that:

(a) The pipe can be subsequently stored, lifted or handled without damage to linings or coatings.

(b) The out of roundness at a plane perpendicular to the pipe axis at any point along the pipe length during storage, lifting or handling does not exceed 4 % of the minimum inside diameter. Out of roundness is measured as the difference between the minimum and maximum inside diameter of the plane at the point.

(c) Safe and easy access to internal tie-in welds is assured for staff and inspectors with equipment.

(d) The maximum length does not exceed 36 meters.

PA 8.5.2.10 Snaking into the trench of butt-welded sections of pipe shall be permissible for bare steel pipes, subject to approval by the Engineer of a complete and comprehensive method statement submitted by the Contractor and provided that the out of roundness as defined and measured above during any stage of the snaking operation, does not exceed 4 % of minimum internal diameter.

PA 8.5.2.11 The linings and coatings of pre-lined and coated pipes jointed together outside the trench shall be made good at these joints outside the trench.

PA 8.5.3 Pipelines with flexible couplings

PA 8.5.3.1 Joints by flexible couplings shall be made only in their final laid position. Before assembling the joint, care shall be taken to ensure that pipe ends are clean and free from burrs and ridges. Such burrs and ridges shall be removed if present and linings and/or coatings made good where damaged. Pipe ends shall be mated carefully before joints are made. Pipe ends shall be concentric and perfectly lined up and the coupling shall not be relied upon to line up or to support the pipe.

PA 8.5.3.2 Joints shall be made, and couplings assembled to the manufacturer's instructions. Bolts shall be placed with bolt heads pointing in the same direction.

PA 8.5.3.3 Two-thirds of the number of coupling bolts, equally spaced, shall first be partially tightened up in a regular sequence, using a short spanner. The remaining bolts shall then be similarly tightened. After checking the coupling alignment, the bolts shall then be finally tightened evenly and in a regular sequence by means of a torque wrench.

PA 8.5.3.4 Where couplings without central registers are used, precautions shall be taken to ensure that the pipe ends are apart by the same distance as if a coupling with central register had been used and the couplings shall carefully be centered over the pipe ends.

PA 8.5.4 Flanged joints

PA 8.5.4.1 Flanges shall be truly parallel with all bolts evenly firm before being finally drawn up with torque wrenches to watertightness. Taper gauges shall be used to check that there is a uniform gap before and after final tightening up of bolts. Bolts shall be tightened in an approved sequence with bolts equally spaced and at opposite ends tightened equally first.

PA 8.5.4.2 The Contractor shall ensure that the correct jointing materials, i.e., gaskets, bolts and nuts are available when required. Only correct diameter and lengths of bolts and studs shall be used. Flat washers shall be used under all nuts. The length of bolts and studs shall be such that at least two and maximum of four threads protrude from the nut when fully tightened. The threads of bolts, studs and nuts shall be thoroughly cleaned and then coated with a Mobil Tag E immediately prior to assembly.

PA 8.5.4.3 All flange faces shall have a gramophone finish and shall be protected against rust by an approved coating.

PA 8.5.4.4 Flanged fittings shall be so installed that there are no stresses induced into the pipework, specials or fittings by forcing ill-fitting units into position or by bolting up flanges with faces not uniformly in contact with their gaskets over their whole faces.

PA 8.7 MAINTENANCE OF CLEANLINESS DURING LAYING

PA 8.7.1 The interior of pipes shall be perfectly clean before being laid and the Engineer may instruct pipe interiors to be cleaned or washed before the pipes are lowered into the trench. All brushes, trowels, welding rod stumps, pieces of mortar, dust and all foreign matter shall be removed from pipes immediately after laying. Once a section of pipeline has been cleaned, it shall be sealed off and shall not be entered again unless permitted by the Engineer in writing.

PA 8.7.2 The Contractor shall at his own expense make good any damage to valves and fittings or clogging of off-takes or mal-functioning of fittings which result from his failure to keep the pipeline in a thoroughly clean condition.

PA 8.8 NIGHT-CAPS

PA 8.8.1 Metal night-caps shall be used to close off all ends of each laid section of pipework when work is stopped at the end of the day or for longer periods and shall be left on the ends of sections of completed pipework until such sections are tied-in with the remainder of the completed pipeline. The night-caps shall consist of a steel plate welded into a half coupling which must be provided with a sufficient number of lugs to secure the ring and gasket and shall be strong enough to withstand external water and earth pressure in the event of flooding or collapse of earth and the joint shall be watertight.

PA 8.8.2 The Contractor shall also, at his own expense blank-off all air valves, scour valves and off-takes with 6 mm thick steel blank flanges which shall be bolted with at least four bolts to tee flanges or shall be fixed to plain ended tee branches by half couplings welded to the blank flanges. These shall be watertight and shall not be removed until the valves or other fittings are about to be fitted.

PA 8.8.3 Notwithstanding the use of night-caps the Contractor shall at his own expense make good all damage to pipe linings and fittings caused by the ingress of dirty water, silt, sand, debris, vermin, insects and other foreign matter. The Contractor shall at his own expense and to the satisfaction of the Engineer clean the interior of the pipeline of such contaminants.

PA 8.9 PREVENTATION OF FLOTATION

PA 8.9.1 Pipes to be encased in concrete shall be prevented from flotation during concreting operations. Apart from this special case during concreting operations, the Contractor shall prevent the flotation of pipework due to stormwater or groundwater entering the trench before backfilling has been completed.

PA 8.9.2 Methods adopted to prevent flotation shall not damage coatings or linings and shall be approved by the Engineer. Notwithstanding this the Contractor shall at his own expenses repair all damage to pipework caused by flotation and/or by the methods adopted to prevent it.

PA 9. REPAIRS TO LININGS, COATINGS AND PROTECTION OF JOINTS

PA 9.1 GENERAL

PA 9.1.1 All damaged linings and coatings of pipes, specials and fittings shall be made good to the satisfaction of the Engineer before installation, provided always that damage, which in the opinion of the Engineer is extensive,might subject such pipe, special or fitting to rejection.

PA 9.1.2 The materials used for the repairs to linings and coatings shall be the same as that used for the pipes, unless otherwise approved by the Engineer in writing.

PA 9.1.3 The linings and coatings of butt-welded steel pipes shall be made continuous over joints as soon as possible after approval and acceptance by the Engineer of the welded joint.

PA 9.1.4 Flexible couplings shall be provided with external protection as soon as the pipeline has been hydrostatically tested and electrically bonded, where applicable.

PA 9.2 FUSION BONDED POLYETHYLENE COATINGS

PA 9.2.1 General

The coating shall be made continuous over butt welded joints by applying a butyl tape wrapping system such as Denso S43/R23 which shall comprise of a cold applied inner and outer wrap of 0.5mm and 0.75mm thickness respectively which shall be applied onto the pipe after the pipe surface has been properly cleaned and primed with a butyl primer.

PA 9.2.2 Surface preparation

Before surface preparation can commence it is essential to remove all dirt and grease from the pipe surface.

The minimum surface preparation standard acceptable shall be St2 (Swedish Standard SIS 055900 1967, Mechanical wire brushing). Circumferential surface preparation shall be carried out to a distance of 200mm each side of the weld bead.

PA 9.2.2 Priming

Priming shall not be carried out further ahead of physical tape wrapping than a maximum of 8 hours. Prime the prepared surface with Denso Butyl Primer to 150mm each side of the weld.
Ensure the primer is dust free prior to application of a tape wrap system. If the primer has become severely contaminated with dust, a re-prime shall be carried out.

Approximately 30 minutes drying time shall be allowed or until the primer is tacky to the touch.

PA 9.2.2 Inner Wrap

The area to be taped shall include the total primed surfaces of the pipe joints and shall include the 50mm widths of primed shop applied coating.

Peel back approx. 0,5m of interleaving and centre 100mm wide inner tape over the edge of the primer on one side of the joint. Press down firmly. Before spiral wrapping commences, a full circumferential wrap of tape is applied by hand with sufficient tension to narrow the width of tape between 1 and 2mm. Whilst maintaining tape tension as described, the tape shall be applied spirally. Interleaving shall be removed as

wrapping proceeds. The tape shall be applied to ensure that a minimum 55% overlap shall be achieved. The tape shall be applied to a minimum width of 50mm beyond the primed area onto the shop applied coating.

PA 9.2.2 Outer Wrap

The area to be taped shall include the total wrapped surfaces of the pipe joints and shall include the 50mm widths of primed shop applied coating on both sides of the inner wrap.

The 100mm wide tape shall be centred over the edge of the applied inner wrap on one side of the joint and pressed down firmly. Before spiral wrapping commences, a full circumferential wrap of tape shall be applied by hand with sufficient tension to narrow the width of tape between 1 and 2mm. Whilst maintaining tape tension as described above, the tape shall be applied spirally. The tape shall be applied in such manner that a minimum 55% overlap shall be achieved. The tape shall be applied to a minimum width of 50mm beyond the applied inner wrap area onto the primed shop applied coating.

PA 9.2 BITUMEN COATINGS

PA 9.2.1 Surface preparation

PA 9.2.1.1 Unprotected steel surfaces shall be wire brushed to standard St 3 of SIS 055900 and all dust and foreign matter carefully removed. All weld spatter shall be removed by scraping and/or grinding.

PA 9.2.1.2 Damaged bitumen prime coats shall be removed by scraping to bare metal, extending back into areas of sound prime coat.

PA 9.2.1.3 Bitumen surfaces showing chalking or other forms of degradation shall be wire brushed down to sound bitumen for a distance of not less than 100 mm from or around the point of repair.

PA 9.2.1.4 Limewash to coatings shall be removed down to sound uncontaminated bitumen for a distance of at least 100 mm from or around the point of repair.

PA 9.2.1.5 Cold applied bitumen primer shall be applied to both steel and exposed bitumen surfaces and be allowed to dry for not less than 4 hours, but not longer than 4 days, care being taken to prevent of primed surfaces.

PA 9.2.2 Application of bitumen

PA 9.2.2.1 A flood coat of hot applied bitumen shall be applied to primed repair areas of coatings to give a coating t hickness not less than 1,5 mm at any point.

PA 9.2.2.2 A single wrap of glass fibre tissue, saturated with hot bitumen shall then be applied around the whole circumference of the joint or over the whole area of repair, whichever in applicable in a manner such that the tissue abuts the edge of the existing coating. The applied glass fibre shall be ironed with hot irons to ensure complete bonding, exclusion of air and complete impregnation with bitumen.

PA 9.2.2.3 A second single wrap of glass fibre tissue, saturated with hot bitumen, shall then be applied such that the two wraps of tissue overlap by at least 50 % of the width of the tissue and at least one wrap of tissue abuts the edges of the existing coating. The second wrap of glass fibre tissue shall be ironed with hot irons to ensure complete bonding, exclusion of air and complete impregnation of bitumen.

PA 9.2.2.4 A flood coat of hot applied bitumen shall then be applied to give a coating thickness above the last wrap of glass fibre tissue of at least 1,0 mm.

PA 9.2.2.5 Two further wraps of glass fibre tissue, saturated with hot bitumen shall then be applied in succession, each wrap as above, but such that at least one layer of tissue overlaps the existing coating by not less than 50 mm. Overlap of successive layers of tissue to be at least 50 % of tissue width.

PA 9.2.2.6 A further flood coat of hot applied bitumen shall be applied over the repair to give a minimum coating thickness of 1mm over the last glass fibre tissue layer and to overlap the existing coating by at least 100mm.

PA 9.2.2.7 In the case of armoured coatings, a single wrap of bitumen saturated glass fibre woven wrap shall be applied at 50 % overlap over the last bitumen flood coat and be ironed with hot irons to ensure complete impregnation of bitumen and bonding. The woven wrap shall then be followed by a further flood coat of hot applied bitumen to give a minimum thickness of not less than 1 mm over the woven wrap.

PA 9.2.2.8 The repaired surface shall then be ironed smooth, neatly feathered into the existing coating.

PA 9.2.2.9 A heavy lime-wash coat shall be applied over the repaired areas of coatings immediately after inspection and acceptance of the repair by the Engineer.

PA 9.2.2.10 When heating bitumen, the temperature shall never exceed 235°C. Bitumen shall only be heated in totally enclosed kettles, equipped with stirrers to keep the molten bitumen agitated and at an even temperature and to prevent localized overheating and scorching of bitumen. The kettle shall be fitted with a thermometer.

PA 9.3 CEMENT MORTAR (CONCRETE) LININGS

PA 9.3.1 Surface preparation

PA 9.3.1.1 Unprotected steel surfaces shall be wire brushed to standard St 2 of SIS 055900 and all dust and foreign matter shall be removed.

PA 9.3.1.2 The edges of the existing lining shall then be brushed to remove all dust and a neat cement/water slurry applied to the pipe wall and the edges of existing lining.

PA 9.3.2 Application of lining

PA 9.3.2.1 A mortar mix equal to the mix used in the existing lining and having a mix proportion of 1 part of cement to 2 parts of clean concrete sand by mass, shall then be troweled into the joint, while the slurry is still wet, taking care to work the mortar well into the tapered edges of the existing lining.

PA 9.3.2.2 The mortar shall be as dry as possible with a water content by mass of not more than 50 % of cement content. Mortar shall be freshly mixed and shall not be re-wetted after original mixing. All mortar older than 1 hour after addition of water shall be discarded.

PA 9.3.2.3 The lining shall be finished smooth with the existing lining.

PA 9.4 SHOP APPLIED EPOXY LININGS AND COATINGS

PA 9.4.1 The maximum allowable number and sizes of repairs to epoxy lined and/or coated pipes on the site by each, the supply and laying contractors, will be as follows:

Linings

No large repairs, i.e. an area greater than 25 mm diameter, will be allowed whilst a maximum of 1 small repair, i.e. an area smaller than 25 mm diameter, per 6 meters length of pipeline.

Coatings

Only one large and one smaller repair, as defined above.

PA 9.4.2 Surface preparation

PA 9.4.2.1 Welded joints and larger repairs i.e., area in excess of 25 mm diameter

The complete area of the weld, unlined sections and heat affected lined sections shall be chipped, scraped and wire brushed to remove all slag, oil, grease, bitumen, and oxidation deposits. The weld bead shall be ground down so that the height of the upset metal and flash on the inner surface shall not exceed 1,0 mm. All weld spatter shall be removed by scraping and/or grinding. The entire surface, including the weld seam, shall be entirely smooth and free from jagged or sharp protuberances.

The complete surface to be lined and/or coated shall then be grit blasted to produce a bright steel finish in accordance with SIS 055900, Grade Sa 2.5. Where this degree of cleanliness does not accurately match the steel colour, use a standard of 95 % average, obtained by photo electric reflectance meter which is calibrated for the steel and type of grit being used, taking 100 percent as the degree of finish obtained when no further increase in reflectance is obtained by extended blasting. All air used for grit blasting shall be free of all oil and moisture. Grit of which 50 % shall not be round, shall be dry and free of foreign matter such as saline or clay contents, bitumen or bituminous type contaminants, oil or other deleterious substances. Particle size shall be such as to produce an anchor pattern profile exceeding 50 micrometers in depth, but not exceeding 75 micrometers in depth as determined by micrometer gauge or portable microscope fitted with a calibrated focusing knob.

After blasting, all dust and debris shall be removed by vacuum cleaning, dry brushing, or dry air blast to a degree such that a piece of clear adhesive tape pressed to the grit blasted surface and thereupon transferred to a white tile, shall show no dust or debris up, when compared with a standard pattern.

Thereafter the grit blasted surface including 25 mm wide strip of sound epoxy lining or coating shall be coated within 2 hours.

PA 9.4.2.2 Smaller repairs i.e., area smaller than 25 mm diameter

The area of repair, including at least 25 mm of sound epoxy lining around the area of repair, shall then be rubbed with a medium grade emery paper. Only Aluminium Oxide abrasives shall be used. Steel surfaces and heat affected epoxy lined surface shall be rubbed down to a bright steel finish, standard Sa 3 of SIS 055900. The 25 mm minimum width of sound epoxy surrounding the area of repair shall be rubbed to remove the lining gloss or all signs of chalking, whichever is applicable.

The complete surface to be repaired including the emery papered edge of the existing lining or coating shall be wiped with a solvent recommended by the supplier of the epoxy and coated within 2 hours of the surface being prepared as described above.

PA 9.4.3 Application of epoxy

PA 9.4.3.1 Each coat is to overlap the existing lining or coating by at least 25 mm.

PA 9.4.3.2 The minimum thickness of the applied lining or coating shall be 300 micrometers dry film thickness.

PA 9.4.3.3 Solvent-free epoxies

The above Clause 9.1.2 shall apply in the case of fusion bonded epoxies which must be applied strictly in accordance with the manufacturer's requirements.

For other solvent-free epoxies however, the area shall receive one coat of a solvent-free repair kit recommended by the same manufacturer and compatible with the epoxy used in the pipes, applied by soft brush, spray or roller to ensure the correct coat coverage. The maximum dry film thickness shall be 500 micrometers.

A large range of epoxy repair materials have been tested to date and only the following materials may be used for temperatures ranging from 10° to 55° and humidities as specified by the suppliers:

(a) Under dry conditions:
(i) Colturiet Submarine supplied by Messrs AECI
(ii) Valspar Patching Compound (Canada)

(b) Wet and underwater conditions:
(i) Hycote 151 by UTC for film thicknesses preferably not greater than 250 and definitely not greater than 500 micrometers.

PA 9.4.3.4 Solvent-borne epoxies

The materials specified above in Clause 9.4.3.3 should be used.

Alternatively, but only with specific written approval of the Engineer, a solvent-borne epoxy may be applied over the area to be repaired in 3 coats by soft brush, spray, or roller with each coat in a distinctly different colour to ensure correct inter coat coverage. The drying time and application for each coat shall be strictly in accordance with the manufacturer's instruction with respect to temperature, humidity etc. The maximum dry film thickness of the applied coating shall be 350 micrometers.

PA 9.4.4 On completion of repairs, the repaired lining shall be tested with a wet sponge holiday detector and thickness of repair checked by an eddy current or magnetic instrument. These tests shall be carried out by the Inspectorate on all repairs.

PA 9.4.5 All repairs, including the joint repairs to the lining, shall be completed, tested and approved by the Engineer prior to backfilling the trench as stated in Clause 7.2.1.2.

PA 9.4.6 Adequate ventilation (and heating if required), shall be provided for the proper curing of the repaired epoxy lining over the internal welded joint.

PA 9.5 IN-SITU APPLIED EPOXY LININGS

PA 9.5.1 Linings shall only be applied after all welding on the pipeline is complete.

PA 9.5.2 No further welding will be permissible on any lined pipes and repairs shall therefore not normally be necessary.

PA 9.6 PLASTIC TAPE WRAPPING

PA 9.6.1 Over the trench wrapping operations shall normally follow completion of site welding and repairs to ndividual welded joints shall therefore not be a routine operation.

PA 9.6.2 Surface preparation

PA 9.6.2.1 Where protection of welded joints or repairs to damaged tape wrappings are necessary, damaged tape shall be carefully cut away to expose at least a 30 mm wide strip of undamaged, un-degraded and sound primed surface.

PA 9.6.2.2 Unprotected steel surfaces, damaged or degraded primed surfaces shall be cleaned by scraping, grinding and wire brushing to remove all primer, rust, oil, grease, welding slag, weld spatter and dust.

PA 9.6.2.3 Welds, where applicable, shall be allowed to cool before application of approved cold primer over the area of repair. The primer to overlap sound exposed primer by at least 30 mm.

PA 9.6.3 Application

PA 9.6.3.1 The complete system of repairs shall be approved by the Engineer in writing prior to affecting any repairs. In general, however, the plastic tape, of the type, grade and quality used in existing wrapping or other approved system shall be applied spirally around the pipe to cover the repair and adjacent sound wrapping by at least 50 mm. The tape shall be applied in at least two wraps, each wrap overlapping by at least 50 % of the width of the tape. (i.e., four layers of tape)

PA 9.7 PROTECTION OF FLEXIBLE COUPLINGS AND FLANGES

PA 9.7.1 Moulded bitumen encasing

PA 9.7.1.1 The coupling or flange shall be protected by covering with moulded bitumen.

PA 9.7.1.2 The coating of the pipe shall project at least 100 mm into the mould over which length of coating the reflective finish shall be carefully removed.

PA 9.7.1.3 The uncoated portions of the pipe and the exposed portions of the couplings shall then be cleaned of rust,

oil, dust and grease and painted with 2 coats of an approved cold applied bituminous primer.

PA 9.7.1.4 The mould shall then be treated internally with thick white wash to prevent the adhesion of bitumen to the mould, and the mould shall then be clamped around the pipe coupling, ensuring that the ends of the pipe coating are covered by the mould.

PA 9.7.1.5 The bitumen shall be suitably heated and shall be poured into the mould so as to encase the coupling components, uncoated pipe ends, bonding thermo-welds and bond conductors entirely with a minimum cover of bitumen of 10 mm and to complete the external protection. The mould shall then be stripped and cleaned ready for use elsewhere.

PA 9.7.1.6 Heating of bitumen shall conform to Clause PA 9.2.2.10.

PA 9.7.2 Polyurethane and tape wrapping

PA 9.7.2.1 Couplings shall be protected by covering with polyurethane foamed in-situ and wrapped with polyethylene tape.

PA 9.7.2.2 The coating of the pipe shall project at least 100 mm into the mould over which length of coating reflective finish shall be carefully removed.

PA 9.7.2.3 The uncoated portions of the pipe and the exposed portions of the coupling shall be cleaned of all dust, rust, oil, and grease and given 2 coats of an approved cold applied bituminous primer that shall be compatible with coating and with polyurethane.

PA 9.7.2.4 The 2 coats of primer applied to the pipe ends and coupling components shall be completely dry before the foam is applied and shall be capable of withstanding the chemical and thermal effects of the foaming process without degradation either of the primer or of the foam.

PA 9.7.2.5 The foam filler shall be formed by a sheet metal mould providing a minimum of 25 mm cover of foam to all uncoated areas of pipe ends, coupling components, bonding welds and bond conductors. The external surface of the moulded foam shall be in the form of a smooth central cylinder surrounding the coupling with smooth conical extension overlapping the pipe coating by 100 mm at each end. The tangent of the angle between the conical surface and the axis of the pipe shall not be greater than 0,25.

PA 9.7.2.6 The foam shall be produced in-situ by the "Caradol C2/Caradate 30" systems as described in Preliminary Information Pamphlet Res/P/U4 published by Shell Chemicals UK Limited or equivalent system and all the manufacturer's instructions with regard to storage, handling, mixing, safety precautions and other procedures necessary for the production of best quality polyurethane foam shall be strictly complied with. The foam shall be homogenous and free of cracks, laminations and discontinuities or weakness of any kind.

PA 9.7.2.7 After completion of the foam filler the external surfaces of the pipe coating within 300 mm of the foam shall be thoroughly cleaned and smoothed exposing bitumen coating free of all dirt, grease, oil and white-wash. Thereafter a 200 mm wide band of an approved cold applied primer, compatible with bitumen, foam and tape adhesive shall be applied at each end of the foam filler to bring the surfaces near the conical ends to a smooth, uniform condition. Each band of primer shall straddle equally the exposed foam/bitumen interface.

The tape wrapping shall be approved 300 micrometers thick plasticizer free, polyethylene pressure sensitive

tape, 150 mm wide of low density and with good conforming characteristics and di-electric properties. The entire joint is to be wrapped with 2 layers of tape, each layer applied smoothly and finishing 2 complete turns over the coating beyond the foam filler at either side of the joint, the last quarter turn at each end being applied in a relaxed state without tension. Each layer of tape is to be wrapped helically with a continuous helical overlap 40 mm wide in each layer.

PA 9.7.2.8 The Contractor shall exercise proper control to ensure that the chemical solutions used in the foaming system are correctly stored at temperatures not exceeding 20°C and for periods not exceeding 6 months or under any other special conditions recommended by the manufacturers. Similarly, the Contractor shall provide such dry-warming equipment as may be necessary to keep the tape warm enough to maintain a degree of conformity adequate for smooth, wrinkle free wrapping over the cone/cylinder transitions in the surface shape of the foam filler.

PA 9.7.2.9 Particular care must be taken to prevent contact of isocyanate foaming material with the skin and eyes and inhalation of the vapour.

PA 9.7.3 Polyethylene sleeves

PA 9.7.3.1 Couplings or flanges shall be protected by covering with polyethylene sleeves.

PA 9.7.3.2 The sleeve shall consist of a continuous sheath of polyethylene at least 250 micrometers thick and 600 mm long and of diameter to suit the coupling and which shall be taped to the pipe on either side of the coupling. The polyethylene shall be black in colour and contain an ultraviolet ray inhibitor. The coated portion of the pipe shall project at least 150 mm into the sleeve.

PA 9.7.3.3 The uncoated portions of the pipe and the exposed portions of the coupling shall be cleaned of all dust, rust, oil and grease and given 2 coats of an approved cold applied bituminous primer.

PA 9.7.3.4 After shaping the sleeve to coupling contours and allowing sufficient slack to prevent stretching of polyethylene across coupling components it shall be taped using pressure sensitive tapes onto the pipe with the tapes extending at least 150 mm on to the sleeve and on to the coated pipe from which reflective finish has been carefully removed for the width of tape wrap. The pressure sensitive tape shall be applied spirally at a tension sufficient to close off the polyethylene sleeves tightly against the pipe barrel and to prevent ingress of water. The tape shall be applied with an overlap of 50 % of width.

PA 9.7.3.5 The polyethylene sleeves shall be slipped over the pipe barrel during laying and before pipes are coupled. The sleeves will however only be applied over couplings on completion of hydrostatic tests. In the interim period, the sleeves shall be protected from sunlight.

PA 9.7.4 Petroleum mastic and tape wrappings

PA 9.7.4.1 Couplings or flanges shall be protected by moulding with a petroleum jelly mastic and wrapped with tape. The coating of the pipe shall project at least 100 mm into the moulded portion over which length of coating the reflective finish shall be carefully removed.

PA 9.7.4.2 The unprotected portion of the pipe and coupling components shall first be cleaned of dust, rust and other foreign matter. "Denso" priming solution or equivalent shall then be applied to the coupling, leaving a thin film on the surface of the sleeve and a liberal amount on bolt heads and nuts, bolt threads, narrow cavities,

etc. at a nominal coverage rate of .8m²/litre.

Where excessive surface corrosion has occurred and where continuous moisture is present, Denso S105 Paste or approved equivalent shall be applied.

PA 9.7.4.3 "Denso Mastic Paste" or equivalent is then applied to cover bolt heads and nuts, flanges, and sleeve to a thickness of 12 mm. Moulding shall be up to but not over the bolts. Apply Denso Profiling Mastic or Denso Triangular Strips to cover all bolt heads and nuts, built up to form an elliptical sphere section for the entire circumference against each side of the flange.

PA 9.7.4.4 "Denso" tape or equivalent is then wrapped spirally around the unprotected portions of the pipe and the coupling, including at least 100 mm of pipe coating on both sides, care being taken to exclude air pockets by moulding into all depressions. The tape shall not be stretched and shall be applied with a minimum overlap of 100 mm at ends.

100mm wide Denso Tape is applied to the circumference of the pipe barrel either side of the pipe flange and to overlap weatherboard fashion the edges of the previously applied tape by not less than 30mm to reinforce and seal the wrapping procedure. Eliminate air pockets, wrinkles, creases, and overlaps as before.

PA 9.7.4.5 Finally polyethylene tape of 300 micrometers minimum thickness shall then be applied spirally over the mould overlapping the pipe coating by at least 100 mm. The ends shall be secured onto the barrel by means of pressure sensitive tapes, tightly taped around the pipe barrel and centred 150 mm over the ends, providing at least 75 mm of pressure sensitive tape on both, the pipe barrel, and the exterior mould wrap. The joint shall be watertight.

PA 9.7.4.6 Care shall be taken at all times to prevent contamination of petroleum pastes and tapes by sand, soil or other foreign matter.

PA 10. CROSSING OF ROADS AND STREAMS

PA 10.1 GENERAL

PA 10.1.1 The Employer shall obtain permission for the crossing of roads from the responsible authorities. All conditions and requirements imposed and/or prescribed by the authorities concerned shall be conveyed to the Contractor who shall be responsible for meeting all such conditions and requirements in carrying out the crossing.

PA 10.1.2 All crossings shall be constructed strictly in accordance with approved drawings.

PA 10.2 ROAD CROSSINGS

PA 10.2.1 Crossings of National, Provincial, District, Divisional, Special roads (hereinafter called major roads) or such other roads as authorities might dictate, shall be made in flanged or butt-welded steel pipes within a steel or reinforced concrete sleeve or a reinforced concrete culvert. Steel pipes to extend over the full width of road reserve plus 5 m on each side.

PA 10.2.2 Crossing of farm roads, unnumbered public roads and minor roads shall, except where otherwise dictated

by authorities, be made by maintaining a one thousand (1 000) mm minimum compacted cover over the crown of the pipe at any point along the pipe centreline for the full width of the carriageway plus shoulders. The Engineer might instruct a 150 mm minimum thickness concrete surround to be placed around the pipe along any length of pipeline at such crossings.

PA 10.2.3 Steel sleeve pipes shall have a 12 mm minimum wall thickness, be lined with a bitumen prime coat and shall be armour coated. Wherever possible reinforced concrete sleeve pipes shall be installed by push boring underneath carriageways unless otherwise specified.

PA 10.2.4 Steel pipes at major road crossings shall have:

PA 10.2.4.1 Wall thicknesses increased by at least 20 % above the required structural thickness or shall be equal to the specified minimum thickness for the size of pipe whichever is the greater. The required structural thickness shall be that pipe wall thickness which shall limit steel stresses to a maximum of 60 % of the minimum yield stress of the steel when the pipe is subjected to design pressure. The pipe of increased wall thickness shall extend for the full width of the road reserve up to points at least 5 m beyond reserve boundaries on each side.

PA 10.2.4.2 Either armour coating of a bitumen glass fibre or a 400 micrometers thick fusion-bonded epoxy coating for the length of sleeves or culverts, including manholes plus a distance of 1 m on each side of the sleeve or culvert.

PA 10.2.4.3 All field applied butt welds falling within reserves 100 % radiographically inspected.

PA 10.2.4.4 All flanged joints moulded as per specification.

PA 10.2.5 Backfilling and reinstatement of road surfaces shall be to the requirements of the Roads Authority. Should the Roads Authority prefer to carry out reinstatement of surfaces by direct labour or otherwise, the Contractor shall pay all charges in connection therewith.

PA 10.2.6 Where no method of reinstatement is specified or requested by the Roads Authority, the following shall apply:

Backfilling around and over sleeves or culverts shall be placed in layers not exceeding 150 mm, measured in the loose, using a selected sandy material. Each layer shall be dampened to optimum moisture content and be compacted to a density not less than 90 % Modified AASHTO before succeeding layers are placed. For surfaced roads, backfilling shall proceed to the underside of the sub-base level when 150 mm of approved sub-base gravel shall be placed and compacted to a density of at least 95 % Modified AASHTO. On top of the sub-base layer, a 200 mm layer of crushed stone base course consisting of material passing a 40 mm square screen and mixed with an approved binder shall be compacted in two 100 mm layers, compacted to a density of at least 98 % Modified AASHTO, each layer to be dampened and thoroughly compacted before placing the succeeding layer. The top layer shall be swept with a hard broom to remove all laitance from stone surfaces but without under pinning the individual crushed stone particles. The upper surface shall then be covered with a light application of primer or emulsion before placing a 32 mm to 40 mm bituminous premix wearing course which should be rolled to a solid layer.

PA 10.2.7 All underground telephone cables or overhead telephone and power lines within or adjacent to road reserves shall be properly supported and protected against damage during all phases of construction.

PA 10.3 STREAM CROSSINGS

PA 10.3.1 Stream crossings comprise all crossings of defined water courses in which water flows or might flow as a result of surface run-off or otherwise.

PA 10.3.2 Stream crossings shall be constructed in steel pipe encased in reinforced concrete, all in accordance with approved drawings.

PA 10.3.3 Steel pipes at stream crossings shall have:

PA 10.3.3.1 Wall thickness increased by at least 20 % above the required structural thickness or shall be equal to the specified minimum wall thickness for the size of pipe, whichever is the greater. The structural wall thickness required shall be that pipe wall thickness which shall limit steel stresses to a maximum of 60% of the minimum yield stress of the steel when the pipe is subjected to design pressure. The pipe of increased wall thickness shall extend for the full length of concrete encased zones plus 2m on both sides.

PA 10.3.3.2 An armoured bitumen-glass fibre coating or a 400 micrometers thick fusion-bonded epoxy coating as specified or as indicated on the drawings or in the Schedule of Quantities whenever encased in concrete.

PA 10.3.3.3 All field applied butt welds within concrete encasements 100 % radiographically inspected.

PA 10.3.4 The top surface of concrete encasements or adjacent pipes shall not protrude above natural bed level of streams, nor shall it in any way interfere with water flow or be the cause of bed erosion.

PA 10.3.5 The Contractor shall be responsible for diversion of flow, if any, over or away from the trench and shall dewater the trench immediately before pipe laying and keep it dewatered until completion of backfilling. He shall be responsible for and shall repair at his own expense, damage to foundations, structures or other parts of the Works caused by flooding due to failure of any part of the diversion or protective works or due to any other cause.

PA 10.3.6 The Contractor shall remove cofferdams, other protective works and surplus spoil immediately after having served its purpose and shall reinstate the site to its original condition. Flooding of adjacent land, bed erosion or changes in location of water courses due to the Contractor's failure to comply with this clause shall be made good at his own expense.

PA 11. HYDROSTATIC TESTING

PA 11.1 GENERAL

PA 11.1.1 Pipelines shall be hydrostatically tested as pipelaying proceeds and after installation of all valves, specials and fittings.

PA 11.1.2 The Contractor shall be responsible for providing all water required for testing, the source of which shall be subject to approval by the Engineer.

PA 11.1.3 The length of pipeline to be tested in one operation shall be as approved by the Engineer.

PA 11.1.4 Where the method of test is in any way in variance to this specification, the Contractor shall submit a detailed method statement to the Engineer and no test shall proceed before approval of such method statement by the Engineer.

PA 11.2 TEST PRESSURES

PA 11.2.1 Test pressures shall be as indicated on the tender drawings. Test pressures shall generally be 1,25 times the pipeline design pressure for design pressures up to and including 3,2 MPa and 1,1 times the design pressure for higher pressures. Design pressure shall be taken as the maximum pressure to which

pipelines might be subjected under all conditions of operation and shall include allowance for transient pressures.

PA 11.2.2 Test pressures over any length or section of pipeline under test, taking possible differences in elevation along the pipeline into account, shall be such that the test pressure at any point along the section is not less than 1,1 times nor greater than 1,40 times the design pressure at these points.

PA 11.3 LEAKAGE RATES

PA 11.3.1 Leakage of a pipeline under test, taken as the aggregate quantity of water added over a 24-hour period to reinstate required test pressure, shall not exceed quantities equivalent to the following:

PA 11.3.1.1 Steel pipelines with flexible joints - 1/3 300 (0,030%) of the volume of water in the section under test.

PA 11.3.1.2 Steel pipelines with welded joints - 1/4 000 (0,025%) of the volume of water in the section under test.

PA 11.3.2 The leakage rate at any one joint in the section under test shall not exceed the following:

$$Q = \frac{\text{Allowable leakage in 24 h of pipeline under test in liters}}{20N}$$

Where Q = Leakage rate in liters/hour
N = Number of joints in section under test

PA 11.4 STATE OF VALVES DURING TEST

PA 11.4.1 The state of valves during the test shall be as follows:

PA 11.4.1.1 In-line isolating valves open, except where used to isolate a test length.

PA 11.4.1.2 Scour isolating valves closed.

PA 11.4.1.3 Off-take isolating valves closed.

PA 11.4.1.4 Scour sleeve valves open unless no scour isolating valve is provided.

PA 11.4.1.5 Air valve isolating valves open.

PA 11.4.1.6 By-pass isolating valves to in-line isolating valves and reflux-valves closed.

PA 11.4.2 The Contractor shall be permitted to test against a closed in-line isolating valve. He should bear in mind however that valve gates and seals are not expected to close drop tight at differential pressures exceeding the design pressure of the valve. Design pressures of valves shall be equivalent to a pipelines field test pressure. No relaxation of specified leakage rates shall be permitted due to leaks past gates, blades, or seals of isolating valves.

PA 11.5 METHOD OF TESTING

PA 11.5.1 The Contractor shall provide an approved test pump, an accurate water meter, sealed pressure gauge and autographic pressure recorder, tested and certified by an independent testing organisation, and all other equipment, materials and labour required for the test.

PA 11.5.2 The section of pipeline to be tested shall be clean and closed off at the ends by isolating valves, and caps or approved end-closure pieces. Free ends shall be firmly strutted against solid supports or thrust blocks designed to withstand safely 2 times the calculated end thrust under maximum test pressure. It shall be incumbent on the Contractor to establish the need for blank flanges or isolating valve flanges in order to limit leakage rates past gates, blades, and seals.

PA 11.5.3 Testing water may be introduced at any air valve within the portion of the pipeline under test. A test manifold shall be placed between the selected air valve and its isolating valve. The manifold shall be provided with three branches, each fitted with drop-tight valves. The main branch shall be sized to suit the Contractor's test pump connection. The two smaller branches shall not be less than 12 mm nominal bore fitted with heavy duty needle valves and reducers to suit pressure gauge connections. A pressure gauge and an autographic pressure gauge respectively shall be connected to each of the smaller branches. A water meter carrying a valid calibration certificate shall be installed between the pump and test manifold. The Contractor shall accurately determine the reduced level at the autographic pressure gauges and enter this level on the recorder chart. The Contractor shall also enter the reduced level of the highest and lowest invert of the section under test on the recorder chart.

PA 11.5.4 The section of pipeline to be tested shall be slowly filled with clean water of quality to the Engineer's approval, great care being exercised to remove all air from the pipeline. The section of pipeline under test shall be completely filled with water and kept full for not less than 3 days in the case of fibre-cement pipelines or steel pipelines with concrete linings and not less than 1 hour in the case of unlined steel pipelines or steel pipelines with linings other than concrete.

PA 11.5.5 During this initial filling stage, the pipeline joints and all specials, fittings and valves shall be visually inspected for visible leaks and same rectified before proceeding with the test.

PA 11.5.6 After the specified absorption period and with the pipeline full of water, the autographic recorder shall be put into operation at least 15 minutes before pressurization of the pipeline commences. Water shall be added until the required test pressure is reached whereupon the valve on the test manifold shall be closed and sealed. The reading on the water meter shall be recorded.

PA 11.5.7 The pressure shall be maintained for one hour and if a pressure drop occurs, more water shall be added to reinstate the test pressure and the valve closed again. The quantity of water added shall be measured by recording the readings before and after pumping. This procedure shall be repeated for a period of 24 hours,

with water added at hourly intervals where necessary to reinstate pressure and water meter readings recorded. At the end of the 24 hours period, the aggregate quantity of water required to reinstate pressure over 24 hours shall be determined.

PA 11.5.8 The Contractor shall give the Engineer 48 hours written notice of his intention to commence pressure testing and the Engineer may attend and supervise all or any part of tests. All records and recording charts shall be handed to the Engineer as soon as tests over any section have been completed.

PA 11.5.9 All valves, specials, fittings, and exposed joints, shall be inspected visually during the 24 hours pipeline test and all visible signs of leaks, sweating and distress shall be reported and attended to without delay.

PA 11.5.10 Immediately after completion of the prescribed 24 hours hydrostatic test, all air valves shall be tested in turn before test pressure in the pipeline is released. Each air valve shall be isolated, and the drain plug removed. The air valve balls, and any actuating linkage shall work freely without restraint. The isolating valve shall be checked for leakage before replacing the plug. Finally, the automatic resealing of the air valves shall be checked by re-opening the isolating valve.

PA 11.5.11 After completion of the tests on air valves, the section of pipeline under test shall be completely refilled with water, if necessary, and pressurized to the static head shown on the drawings. Each scour valve shall be checked by opening isolating valves and sleeve valves where applicable for a duration sufficient to check the complete opening and closing cycles. If necessary, the pipeline shall be refilled after each individual test and re-pressurized to static pipeline head in order to test all scours within the section under test.

PA 11.6 REMEDIAL MEASURES

PA 11.6.1 Should the maximum leakage limits as specified be exceeded, the Contractor shall determine the position and cause of the leaks and shall take remedial measures at his own expense and to the satisfaction of the Engineer to stop such leaks and ensure the specified degree of water tightness. Under no circumstances shall peening be permitted as a means for stopping leaks, nor shall the pipeline be allowed to remain under extended period of pressure to allow self-sealing with or without sealing aids in the test water. Any leakages from valves not supplied under this contract and which cannot be easily stopped by gland adjustment will be the responsibility of the Employer. The Contractor shall in the case of latter event occurring provide and install blank flanges to seal off leaks and to allow testing operations to proceed or to be speeded-up. The supply and installation of these blank flanges shall be covered by a variation to the contract at the rates indicated in the Schedule of Quantities.

PA 11.6.2 If during the contract period of maintenance, the number of leaks and other defects is considered by the Engineer to be more than could reasonably be expected from a well laid pipeline operating under normal conditions, he may order the Contractor to re-test parts or the whole of the pipeline at the Contractor's own expense and no claims for escalation in costs or for whatever other reasons the Contractor might consider to submit claims be considered, except where such re-tests are the result from damages caused to the pipeline by the Employer.

PA 12. STERILISATION

PA 12.1 All pipelines for the conveyance of potable water shall be sterilized.

PA 12.2 As soon as the whole pipeline has passed a hydrostatic test, test water shall be scoured to ensure a flushing velocity of not less than 1 m/sec. over the entire length of the pipeline.

PA 12.3 Potable water treated with sodium hydrochloride or calcium hypo chloride or chlorine gas to a chlorine concentration of not less than 5 mg/l free available chlorine, shall be introduced into the pipeline or section of pipeline to be sterilized. On completion of filling with chlorinated water the chlorine concentration in water sampled at any point along the section of pipeline filled, shall not be less than 3 mg/l free available chlorine.

PA 12.4 In determining chlorine concentrations the Contractor shall satisfy the Engineer that the method adopted does measure free available chlorine concentration and not total chlorine residuals, the latter being the easier to determine by means of simple comparators.

PA 12.5 Chlorinated water shall be retained for at least 2 hours during which all air valves, in-line isolating valves, by- pass valves, branch isolating valves and scours shall be operated in order to expose all interior surfaces of these appurtenances to the chlorinated water.

PA 12.6 After 2 hours retention of chlorinated water in the pipeline, samples drawn at any point along the pipeline shall contain not less than 0,5 mg/l free residual chlorine. Where necessary, additional chlorine shall be injected to maintain chlorine residuals, provided always that the 2 hours minimum retention time with water containing an initial free chlorine residual of at least 3 mg/l and a final free residual of not less than 0,5 mg/l is maintained.

PA 12.7 On completion of sterilization of any section of pipeline, the water in that section may be retained or may be passed along the pipeline to other sections to be sterilized.

PA 12.8 Provided cleanliness of pipelines has been maintained during transport, storage and laying and provided furthermore that testing water is of potable quality, the Engineer may allow the introduction of chlorine gas or compounds into water during hydrostatic testing of pipelines. Should in these instances entry into the pipeline be necessary at any stage to repair leaks or shall the interior surfaces of any pipe, fitting, valve or similar appurtenance be touched by humans, equipment etc., portions so affected shall be re-sterilized.

PA 12.9 Provided the pH of water used for the sterilization of pipelines can be proved to be less than7,5 before introduction of chlorine, the retention period of chlorinated water in the pipeline may be reduced from 2 hours minimum to 1 hour minimum.

PA 13. DRAINAGE OF PIPELINE

PA 13.1 Standing water in a pipeline can lead to anaerobic conditions where sulphate reducing bacteria can cause corrosion.

After a pipeline has been hydrostatically tested and sterilized, if required, it shall be completely drained of all water, including pumping out of all low laying areas such as at scours, etc. Sections that will not need refilling for testing or sterilization should be drained sooner.

This will generally apply unless otherwise instructed by the Engineer.

PA 14. MISCELLANEOUS CONSTRUCTION WORKS AND WORKMANSHIP PA 14.1 FENCING

PA 14.1.1 Temporary fences

PA 14.1.1.1 Temporary fences shall be stockproof.

PA 14.1.1.2 Where used to fence off the pipeline working area across properties or camps protected by vermin-proof fencing, "jackal proof" netting wire shall be provided.

PA 14.1.1.3 The minimum standard shall be five strands of 2,5 mm thick galvanised wire, sufficiently spaced.

PA 14.1.1.4 The Contractor shall supply, install and maintain temporary gates of the standard as specified hereunder at such points as instructed by the Engineer for access across the temporarily fenced off working area or to parts of properties severed by temporary fences.

PA 14.1.2 Permanent stock-proof fences

PA 14.1.2.1 Plain stock fencing shall be 1,2 meter high and shall have at least 6 strands of double barbed, 2,5 mm thick galvanised wire or single barbed, 2,95 mm thick galvanised wire. Spacing of wire strands shall be in accordance with the general practice for fencing in the particular area.

PA 14.1.2.2 Fencing standards at least 1,8 meter long either of 3 kg/m iron I-section or creosote impregnated hardwood of 70 to 100 mm minimum diameter shall be erected vertically and be spaced at 12-meter intervals with at least 2 droppers of length minimum 75 mm more than fence height, between standards.

PA 14.1.2.3 Droppers shall either be ridged T-section iron droppers or creosote impregnated hardwood of 30 mm minimum diameter or twisted galvanised wire droppers of double 4 mm thick wire.

PA 14.1.2.4 At each change of direction and at intervals not exceeding 400 meters on straights, straining or corner posts shall be provided. Straining or corner posts shall be 2,1 meters long, buried to a depth of at least 750 mm into the ground and properly stayed in the direction of direct pull of the wire. Backfilling in all post holes shall be thoroughly consolidated to give adequate support. Where necessary or instructed by the Engineer, straining or corner posts shall be concreted in. Straining and/or corner posts shall either be rail section of 10 kg/m mass or steel tubing of 100 mm minimum nominal bore or creosote impregnated hardwood of 150 mm minimum diameter. Each steel post shall have a base plate of size at least 230 x 230 x 5 mm and in the case of tubular posts, a pressed steel or cast-iron cap at the top.

PA 14.1.2.5 Materials for posts, struts, droppers etc. shall suit climatic and soil conditions and the Contractor shall be guided in his choice of materials by existing fencing practices in the area concerned.

PA 14.1.2.6 Steel and iron straining posts and struts shall be hot dipped galvanised in accordance with SABS 763 to a final thickness of 75 micron and a weight of 600 grams per square meter.

PA 14.1.3 Permanent vermin-proof fencing

Vermin-proof fencing shall be constructed as for plain stock fencing with at least 3 supporting strands of 2,8

mm thick high strain steel wire, ± 1 meter high covered with 75 mm x 1,8 mm thick "jackal proof" netting wire. A further single strand of double barbed 2,5 mm thick galvanised wire shall be placed þ 200 mm above the netted area. Netting wire shall be placed so as to prevent vermin from creeping under.

PA 14.1.4 Gates

PA 14.1.4.1 Gates shall be single leaf approximately 4 300 mm opening and 1 200 mm high. They shall be of welded tubular construction braced diagonally in both directions. The gates shall be of approved design but in any case, the frame shall be of medium quality galvanized tubing of 40 mm minimum bore and the braces shall be of galvanised tubing of 32 mm minimum bore. All gates shall be hot dipped galvanised in accordance with SABS 763 to a final thickness of 75 micron and a weight of 600 grams per square meter.

PA 14.1.4.2 Frames shall be covered with horizontal galvanised wires at 220 mm centers where gates are to be installed in stockproof fences. Gates for installation in vermin-proof fences shall be covered with galvanised 50 mm diamond wire mesh of 2,50 mm thick wire.

PA 14.1.4.3 All gates shall be hung horizontally in an approved manner on boxed stays consisting of pairs of cross braced and strutted 10 kg/m iron rails or creosote impregnated hardwood of 150 mm minimum diameter, all posts firmly concreted in. Boxed stays shall be provided on both sides of the gate.

PA 14.1.4.4 All gates shall be placed in line with existing fences.

PA 14.1.4.5 All gates shall be provided with a galvanised locking chain welded to the gate post.

PA 14.2 CONCRETE WORK

PA 14.2.1 General

PA 14.2.1.1 All concrete work shall be finished to the lines, levels slopes and outlines shown on the drawings or as otherwise directed.

PA 14.2.1.2 All exposed concrete surfaces shall be finished such that surface irregularities shall not exceed a tolerance of ± 8 mm and shall be rubbed down with a carborundum stone to present a surface of even colour and a smooth and pleasing appearance. All exposed edges shall be chamfered by 40 mm chamfers fixed to shuttering. Unless otherwise specified all floors shall have a wood-float finish.

PA 14.2.1.3 Surfaces shall be free from honeycombing and protrusions. Honeycombing to the extent that in the opinion of the Engineer the strength of the structure is impaired, or the reinforcement is subject to corrosion or lack of bond, shall be removed and replaced with satisfactory concrete at the Contractor's expense within 72 hours of the concrete originally being placed.

PA 14.2.1.4 The minimum concrete cover to reinforcement of concrete surfaces permanently in contact with ground shall be 50 mm and for all other surfaces shall be 40 mm.

PA 14.2.1.5 All pre-cast units shall be steel-troweled on upper surfaces to present a dense, homogenous surface.

PA 14.2.1.6 Slight spalling of top edges of manholes to be covered by pre-cast or cast-in-situ cover slabs shall be permitted provided the maximum dimension of the spall measured along any face shall not exceed 25 mm

and provided further that no reinforcement is exposed. The maximum permissible difference in any of the two measurements taken to opposite corners diagonally across rectangular or square structures shall not exceed 2 % of that measurement calculated from the drawing. The tolerance in thickness of walls or cover slabs shall be ±15 mm.

PA 14.2.2 Thrust blocks

PA 14.2.2.1 Before any thrust block is cast, the pipe special or fitting shall be supported and secured in its correct alignment and shall be jointed to the adjacent pipework.

PA 14.2.2.2 The width of any thrust block shall be limited to 1 500 mm either side of pipe or special centre line to ensure space for future pipelines in the same servitude. Concrete faces of thrust blocks shall be a minimum of 300 mm from flanges and from flexible coupling centers. The bearing face of thrust blocks shall be cast against undisturbed soil or rock.

PA 14.2.3 Valve chambers

PA 14.2.3.1 Chambers for isolating valves, air valves, meters, access manholes etc. shall be constructed in accordance with approved drawings.

PA 14.2.3.2 Care shall be taken that the elevation of air bricks and tops is such that no ingress of surfaces run-off or ground water into chambers can occur.

PA 14.2.4 Encased pipework

PA 14.2.4.1 Where steel pipes and/or specials are permanently encased in concrete, e.g., in thrust blocks, walls of concrete valve chambers, stream crossings, etc., the coating over the portion to be so encased shall be to the same standard as the rest of the pipeline, except where indicated to the contrary in the Schedule of Quantities or on the drawings.

PA 14.2.4.2 Whenever it is necessary to encase fibre-cement pipes in concrete, the flexible joints shall not be encased, and the concrete shall terminate 300 mm from the flexible joint.

PA 14.2.4.3 Thrust/puddle flanges of pipes or specials encased in concrete shall be painted with one coat of bitumen primer and two coats of bitumastic paint to a dry film thickness of 180 micrometers except where indicated to the contrary in the Schedule of Quantities or on the drawings.

PA 14.3 BRICKWORK

PA 14.3.1 Brickwork is to be built to the dimensions, thicknesses and heights as shown on the drawings.

PA 14.3.2 All joints shall be completely filled with mortar. Joints to face brickwork shall be neatly rounded with a 10 mm diameter grooving tool while faces of common brickwork which are to be plastered, shall have joints raked out to a depth of 12 mm to ensure good plaster bond.

PA 14.3.3 Mortar shall consist of one part cement to four parts approved sand by volume and shall be used within one hour of mixing.

PA 14.3.4 Brickwork shall be built in stretcher bond and all common bricks shall be well wetted before being laid.

PA 14.4 FABRICATED STEELWORK AND STEEL PIPE SPECIALS

PA 14.4.1 All fabricated steelwork for covers, locking bars, keep plates, hinge plates, grids, etc., shall be manufactured from mild steel plate, chequer plate and/or bar as detailed on the drawings. All the steelworks shall be heavy duty hot dipped galvanised in accordance with SABS 763.

PA 14.4.2 All welding shall be carried out in accordance with SABS 044 - "Code of Practice for Welding".

PA 14.4.3 Manhole locking bars, hinges, holding down straps, etc., shall be heavy duty hot-dip galvanised after fabrication and site welding, drilling and cutting if unavoidable, shall be chipped to remove slag, wire brushed and painted with at least three coats of approved cold galvanizing solution.

PA 14.4.4 The galvanizer must be a member of the Hot-dipped Galvanizing Association of South Africa (HDGASA) and must be a SABS accredited galvanizer. The galvanizer must supply a SABS certificate with all items delivered to site.

PA 14.5 SERVITUDE ROAD

PA 14.5.1 The Contractor shall build a servitude road 3 meters wide along as much of the length of the pipeline as is practicable for the use of the Employer's vehicles for patrolling and maintaining the completed pipeline.The road shall be built as shown on the drawings or in the specification unless otherwise instructed by the Engineer in writing. It shall be built to conform closely to the shape of the natural ground to prevent interference with the surface drainage.

PA 14.5.2 After the pipeline servitude has been cleared of all boulders, trees, bush and other vegetation and prior to trenching operations; the Contractor shall mark out the area of the roadway to the Engineer's approval. Thereafter all topsoil and grass shall be removed over the width of the road to an approximate depth of 200 mm by means of a motor grader or scraper, the excavated material being placed in windrows parallel to and clear of the edges of the roadway on one or both sides.

The windrows may be flattened so as not to restrict pipelaying operations. The Engineer may order a greater or lesser depth of topsoil to be thus removed to expose subsoil or to remove unsuitable material depending on site conditions.

PA 14.5.3 When trenching operations commence, material surplus to backfilling requirements and suitable for surfacing the servitude road shall be dumped on the roadway and spread by motor grader or bulldozer as work proceeds. Laterite, shales, decomposed tillite, dolerite gravels and the like in suitable form, and materials containing rock fragments which will break down under a grid roller to provide well graded material will be suitable for the road formation. Soils with a high content of clay and similar fine materials shall not be used for road surfacing. Any shortfall of surfacing material shall be imported from approved borrow pits.

PA 14.5.4 The Contractor may construct the servitude road immediately after the trench has been completed or after the pipeline has been backfilled and while the servitude area and working area are being reinstated. When the 3 meters width of surfaced servitude road has been completed, the topsoil shall be bladed up to both edges of the roadway and compacted to form a smooth surface free of cuts or banks except where the Engineer may direct otherwise.

PA 14.5.5 A grid roller shall be used, and water applied for binding as required. Compaction of the servitude road formation shall be achieved by the careful routing of construction vehicles along the roadway, supplemented by the use of a grid roller. The final operations of grading and the surface of the road and adjoining areas with the servitude shall be performed with a motor grader.

PA 14.5.6 In areas where the topography precludes the building of the servitude road as described above, the Engineer may direct such benching and earthworks as he may consider necessary to establish access for the Employer's supervisory vehicles. However, such works will be of a minor nature and Tenderers shall understand that they are not intended for pipeline construction purposes.

PA 14.5.7 Material excavated from the pipeline trench surplus to pipeline backfilling or road surfacing requirements shall, if considered suitable by the Engineer and without extra cost be used for road formation at swamp crossings and the approaches to stream crossings instead of being spoiled to waste. Concrete aprons at stream crossings shall be constructed as shown on the drawings or instructed by the Engineer.

PA 15. FINAL PAINTING

PA 15.1 After successful hydrostatic testing of the pipeline and after completion of all construction work under this contract all external surfaces of uncoated or ungalvanized steelwork and surfaces of all valves and fittings shall be prepared and painted as hereinafter specified. In addition, all surfaces of materials which has received first coat of paint in the course of the contract in accordance with this specification, shall receive final coats of paint of the same colour or such other colour as may be specified or instructed by the Engineer.

PA 15.2 SURFACE PREPARATION

PA 15.2.1 Bare steel surfaces

All bare steel or cast-iron surfaces and all steel or cast-iron surfaces previously primed or painted and of which prime, or paint coats show signs of deterioration shall be sand blasted to bare steel to standard St 2 of SIS 055900. Where necessary, a combination of hand tools, mechanical grinders, and a chemical cleaner such a "Prolux Ferrokleen" or equivalent shall be used to obtain the specified degree of cleaning. After cleaning, all dust and debris shall be removed by brushing with a clean stiff bristle which shall be kept clean by frequent rinsing in white spirits or equivalent solvent.

PA 15.2.2 Prevously painted surfaces

Previously primed or painted surfaces in sound condition shall be wiped with a rag soaked in white spirits to remove all signs of dust, debris, bitumen, oil and grease. Where necessary, chalked or slightly weathered surfaces shall be given a light sanding to expose fresh paint layers.

PA 15.3 PAINTING

PA 15.3.1 Prime coat and second coat PA 15.3.1.1 Bare steel or cast-iron surfaces
Immediately after cleaning and not more than 2 hours after cleaning, provided surfaces are kept dry and free dust, a coat of approved cold applied bituminous primer shall be applied by brush or roller to a minimum dry film thickness of 100 micrometers. As soon as the prime coat is dry to the touch a second coat of an approved bituminous paint shall be applied by brush to a minimum dry film thickness of 150 micrometers. All coats shall be applied evenly and shall be free from tears and runs. The coats shall be kept dry and free of dust and debris.

PA 15.3.1.2 Previously painted or primed surfaces

Immediately after cleaning and not more than 2 hours after cleaning, provided surfaces are kept dry and free of dust and debris, a coat of an approved bituminous paint shall be applied by brush to a dry film thickness of not less than 150 micrometers. The coat shall be applied evenly and shall be free from tears and runs. The coats shall be kept dry and free of dust and debris.

PA 15.3.2 Final coat

As soon as second coats are dry to the touch, one coat of bituminous based aluminium paint shall be applied by brush to a dry film thickness of not less than 150 micrometers. The coat shall be applied evenly and shall be free from tears and runs. Paint coats shall overlap coated portions of pipes and specials by at least 75 mm.

PA 15.4 All painting shall be carried out under the supervision of a skilled, experienced, and competent painter. No painting shall be done in wet weather and all coats shall be applied to clean dry surfaces.

PA 15.5 All paint shall be used from the original containers of the manufacturer and such containers are to be brought onto the site unopened. No adulteration will be permitted, and paints shall be used strictly in accordance with the manufacturer's instructions.

PA 15.6 The Engineer shall instruct any painted steel or cast-iron surface to be inspected with a holiday instrument with copper bristle detector and operating at 5 kV. Single holidays may be repaired by overcoating, but if more than 2 holidays are detected over any area of 0,5 m the Engineer may reject the paintwork. Rejected paint surfaces shall be re-cleaned to bare steel surface to the standard specified and shall be repainted at the Contractor's expense.

PA 15.7 The following parts and/or surfaces shall not be painted over:

PA 15.7.1 All working parts of valve actuators which will result in the malfunctioning of the valve.

PA 15.7.2 All indicators, makers plates, instruction plates, hard stamping etc.

PA 15.7.3 All stainless steel, chromium plated parts and non-ferrous work.

PA 15.7.4 Grease nipples, grease cups, valve indicators, exposed spindles.

PA 15.7.5 Hot dipped galvanized surfaces. If cutting of galvanized parts cannot be prevented, exposed steel shall be thoroughly cleaned and painted with at least 3 coats of an approved cold galvanizing solution or "Prolux Zinc Galv 6" or equivalent.

PA 15.8 All working parts of valves and fittings shall be checked to ensure that they operate freely and correctly and shall be lubricated after all paintwork has dried out.

PA 16. MARKER BEACONS, BENCHMARKS, TRIANGULATION BEACONS AND MARKING OF VALVE CHAMBERS

PA 16.1 Precast concrete marker beacons as detailed on the drawings shall be placed exactly above the centre line of the completed pipeline and concreted-in at all changes of direction, on reserve boundaries, on both sides of road crossings, on both sides of river crossings, at farm boundary crossings and at one-kilometer intervals generally on straight sections of the pipeline.

PA 16.2 Combined triangulation-benchmark beacons as detailed on the drawings shall be placed exactly above the centre line of the completed pipeline at all changes of direction, on reserve boundaries, on both sides of river crossings and at farm boundary crossings. The exact chainage measured along the pipeline at each benchmark shall be punched clearly into the plate on the benchmark beacon and a serial number to easily identify a benchmark beacon or to detect loss of a beacon. Wherever possible and approved by the Engineer these triangulation pins with benchmark and marking plates with data shall be incorporated

on the outside of chambers founded on undisturbed ground i.e. reflux valves, isolating valves, one of the road crossing access chambers, etc.

The beacons shall all be accurately numbered, levelled and triangulated with the following data to the specified accuracy hard stamped on it:

(i) Beacon number.

(ii) Measured chainage.

(iii) Reduced level above MSL to an accuracy of ±(0,01+0,005 v length of pipeline in km).

(iv) "X", "Y" and "Z" co-ordinates in meters to the applicable "Lo" system according to the Survey Act, 1927 for Class accuracy.

On completion of triangulation the threaded portion of the triangulation pins shall be covered with a graphite/grease compound and the end covers firmly screwed back by hand.

PA 16.3 All chambers constructed on the pipeline shall be clearly marked on the outside to denote the appurtenances housed in each and the chainages thereof. Marking shall be by stenciling in road marking paint in letters not smaller than seventy five (75) mm.

All markings shall face the upstream direction. Abbreviations to be used shall be as follows:

(i) Air valves AV

(ii) Isolating valves IV

(iii) Scour valves SV

(iv) Access only AX

(v) Air valve in conjunction with access AV

(vi) Reflux valves RV

(vii) Insulating flanges IF

(viii) Water meters WM

(ix) All farm off-takes FO

(x) All bulk off-takes BO

(xi) Surge tank ST

PA 17. COMPLETION DRAWINGS

The Contractor shall submit acceptable complete "As-built" drawings before the issue of the Completion Certificates. Failing this the penalty as stated in the "Appendix to Form of Tender" shall apply. The "As-built" drawings shall conform to the requirements described below:

One complete set of paper prints of the drawings supplied to the Contractor shall be marked "As-built" with all changes shown in red.

PA 18. SUPERVISION AND INSPECTION

PA 18.1 GENERAL

PA 18.1.1 The Works will be supervised and inspected by the Engineer and/or his authorized Representatives. Such supervision and inspection shall in no way relieve the Contractor of his obligation and responsibility for performing the Works in accordance with the contract.

PA 18.1.2 The Contractor shall institute his own inspection of the Works and shall conduct tests to ensure that the materials supplied, and quality of workmanship comply with the requirements of the contract. The Contractor must therefore be in possession of his own testing equipment.

PA 18.1.3 The Employer may appoint an independent Inspectorate who shall act on behalf of the Engineer to conduct

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any test to ensure that materials and workmanship comply with the requirements of the contract.

PA 18.1.4 The Contractor shall provide access at all times and shall be responsible for the opening and closing of access covers for inspection purposes and for providing sufficient labour and equipment such as ladders, rubber-tyred trolleys, rubber mats or other suitable protection for linings, lighting etc., all to the approval of the Engineer, to enable the Engineer, his authorized Representative or the Inspectorate to inspect the Works efficiently. The Engineer and the Inspectorate shall be afforded every facility to enable inspection to be carried out effectively.

PA 18.2 WELD INSPECTION

PA 18.2.1 Radiographic examination

PA 18.2.1.1 Butt welds shall be examined radiographically, processed, and adjudicated by the Contractor on site in accordance with API 1104. Cracks, lack of complete penetration or lack of complete fusion shall be considered injurious defects. The standard for acceptance of minor imperfections such as slag inclusions or gas pockets shall be that specified in clauses 9.2 to 9.13 inclusive of API Standard 5L.

All radiographs shall be adjudicated and approved by the Inspectorate.

PA 18.2.1.2 10 % of the total length of all manual field welds, 2 % of the total length of field welds done by an approved automatic process and 100 % of the length of all welds at miters shall be examined radiographically with particular reference to weld intersections, using equipment supplied and staffed by the Contractor.

PA 18.2.1.3 The Engineer reserves the right to decrease the length of welds radiographed to a minimum of 4 % of manual welds and 1 % of automatic welds if the standard of welding is consistently high and justifies the reduction.

PA 18.2.1.4 The Engineer however also reserves the right to increase the length of welds to be radiographed to 100 % of length of weld on the following basis and any increase above 10 % of length of manual welds or 2 % of length of automatic welds, shall be to the Contractor's account.

PA 18.2.1.4.1 If in 10 % of length of manual welds or 2 % of length of automatic welds radiographed, more than 1 out of every 5 butt welded joints successively examined shows defects, length of weld to be radiographed shall be increased to 20 % of manual welds and 5 % of automatic welds.

PA 18.2.1.4.2 If in 20 % of length of manual welds or 5 % of length of automatic welds radiographed, more than 3 butt welded joints in any 10 joints successively examined shows defects, the length of weld to be examined shall be increased to 50 % of manual welds and 10 % of automatic welds.

PA 18.2.1.4.3 If in the length of welds so radiographed, more than 5 in any 20 joints successively radiographed shows defects, the Engineer may increase the length of weld to be examined at his own discretion up to 100 % of manual and automatic welds.

PA 18.2.1.4.4 All defects shall be repaired and re-radiographed at the Contractor's cost and such radiography of repairs shall not be deemed to be included in the required percentage of radiography.

PA 18.2.1.4.5 Claims arising from delays in construction caused by justifiable additional radiography which may be

ordered by the Engineer or necessitated by weld repairs, shall not be considered.

PA 18.2.2 Visual examination

PA 18.2.2.1 All field welds shall be examined visually.

PA 18.2.3 Fillet welds

PA 18.2.3.1 Apart from visual examination, fillet welds shall be subjected to dye penetrant or magnetic particle tests at the Inspectorate's discretion.

PA 18.2.4 Repair of welds

PA 18.2.4.1 The repair procedure and performance, and welders employed on repairs shall be as stated in Appendix B of API Standard 5L. Each repair weld shall be marked with the welder's identifying stamp.

PA 18.2.4.2 All costs related to the repair of defective welds shall be borne by the Contractor. When the repair has been made the full length of the repair shall be examined radiographically.

On discovery of reject welds, the engineer may, at his discretion, call for additional radiographic examination until it is shown that the necessary standard is being maintained.

PA 18.2.4.3 Defective welds shall be repaired immediately they are found to be so. The Engineer has the right to stop the Contractor proceeding with further pipe laying in the event of the Contractor delaying the rectification of defective welds. Furthermore, no consideration will be given to any claims arising from delays in construction resulting from such action.

PA 18.3 INSPECTION OF LININGS AND COATINGS

PA 18.3.1 All linings and coatings, whether having passed a factory inspection or not, shall be inspected on site and shall be subject to rejection.

PA 18.3.2 All repairs to linings and coatings shall be subject to inspection.

PA 18.3.3 All materials used on site for lining and coating or for repairs to linings and coatings shall be subjected to tests. The number of samples tested, and the sampling points shall be at the Engineer's or the Inspectorate's discretion. The Contractor shall provide all samples free of charge.

PA 18.3.4 Materials rejected shall be removed from site without delay, whether such materials have already been applied to pipes, specials, and appurtenances, or not.

PA 19. MEASUREMENT AND PAYMENT

PA 19.1 GENERAL

PA 19.1.1 All rates, lump sums and prices shall be held to include all labour, plant, equipment, materials, supervision, overheads, profits and maintenance as per contract.

PA 19.2 SURVEYS, SETTING OUT, DRAWINGS (INCLUDING "AS-BUILT")

PA 19.2.1 Shall be priced as lump sums in the section for "Fixed Charge and Value Related Items" under the relevant Preliminary and General items in the Schedule of Quantities.

PA 19.2.2 Payment shall be in equal monthly installments over the approved contract period.

PA 19.2.3 Sums shall be held to include for re-drawing and/or correction of drawings not approved by or acceptable to the Engineer.

PA 19.3 SITE CLEARING

PA 19.3.1 Shall be measured per linear meter of pipeline centerline cleared over the width of the permanent servitude.

PA 19.3.2 Rates shall be held to include for clearing of wider areas where required by the Contractor, for removal of trees, de-stumping, de-rooting, for disposal of vegetable matter by burning and safeguarding against veld or bush fires related thereto, for disposal of vegetable matter, timber, stumps, rubble, debris etc. to approved dumping sites within 5 km radius from point of loading.

PA 19.3.3 Wherever deemed necessary in the opinion of the Engineer, extra over rates will be provided in the Schedule of Quantities for clearance of trees and stumps not covered by rates in clause PA 19.3.1.

PA 19.4 DEMOLISHING

PA 19.4.1 Demolishing of huts, houses and similar structures falling within the width of the permanent servitude shall be priced as a lump sum payable on completion of the item.

PA 19.4.2 The sum shall be held to include for demolishing the entire structure and foundations and all services and facilities related thereto and for disposal of all materials, rubble, and debris to approved dumping sites within 5 km radius from point of loading.

PA 19.5 TRENCH EXCAVATIONS

PA 19.5.1 Shall be measured per linear meter length along the centre line of the trench. The depth will be measured from the surface of the ground to the bottom of the specified bedding layer.

PA 19.5.2 Rates shall be held to include general leveling to facilitate use of plant, all work in connection with access through existing fences and reinstatement of same with new materials and gates as specified , all expenses in entry upon properties, the crossing, deviation, maintenance and reinstatement of services and utility installation, shoring, battering, overbreak, dewatering, trimming of trench bottoms, repairs and/or reinstatement of trenches after flooding or any other reasons, and all additional work and limitations to work due to blasting or other restrictions imposed by statutory authorities, other than the Engineer, for provision and maintenance of access at required points across trench.

PA 19.5.3 Extra over rates for stripping and setting aside of topsoil to stockpile, and later reinstatement shall be scheduled.

PA 19.5.3.1 Excavate topsoil from pipeline trenches and stockpile cubic metre (m3)

The unit of measurement shall be the cubic metre of topsoil excavated within the specified widths over the lengths and depths authorized by the engineer for each pipeline and stockpiled. Excavation in excess of the authorized dimensions will not be measured for payment.

The tendered rate shall include full compensation for excavating, loading, transporting, off-loading and stockpiling the topsoil.

PA 19.5.3.1 Remove topsoil from stockpile and reinstate within the servitude cubic metre (m3)

The unit of measurement shall be the cubic metre of topsoil removed from stockpile and placed above the backfill in pipeline trenches as and where instructed by the engineer. The authorized dimensions of the pipeline trench widths times the authorized depth of topsoil shall be used to calculate the volume of topsoil replaced.

The tendered rate shall include full compensation for removing the topsoil from stockpile, irrespective of distance, for loading, transporting, off-loading, placing, and spreading the topsoil to the required thickness, for levelling it off to a smooth surface, for removing any stones from the top surface and for lightly compacting the topsoil.

PA 19.5.3 Extra over rates for excavations at road crossings shall be held to include for traffic control, deviations, warning signs, safeguarding and all precautions demanded of works dictated or required by roads authorities and/or the GPO.

PA 19.5.4 Extra over rates for excavations at stream crossings shall be held to include for flow diversion, repair of flood damage to work, dewatering of trenches.

PA 19.5.5 The excavation and trimming of joint holes to facilitate all activities necessary to make and complete pipe joints shall be deemed to be included in the tendered rates for trench excavations.

PA 19.6 EXCAVATIONS FOR VALVE CHAMBERS, THRUST BLOCKS, CULVERTS, CONCRETE ENCASEMENTS AND SIMILAR STRUCTURES.

PA 19.6.1 Shall be measured in cubic meters (m3) nett to the outside dimensions of the structure for all excavations outside trench payment lines. The cross-sectional area of trench payment lines shall be defined by the minimum specified trench width and the depth of cut from ground level up to 150 mm or 200 mm as the case may be for a particular type of pipe, below the underside of the pipes.

PA 19.6.2 Rates shall be held to include for widening to allow working space around structure, shoring, battering, overbreak, trimming, dewatering and all additional work and limitations to work due to blasting or other restrictions imposed by statutory authorities other than the Engineer.

PA 19.6.3 Extra over rates for excavations at road and river crossings shall be held to include for all the aspects as per sub-clauses PA 19.5.3 and PA 19.5.4.

PA 19.7 PREPARATION OF TRENCH FLOOR AFTER COMPLETION OF BULK EXCAVATIONS

PA 19.7.1 Shall be measured per cubic meter (m3) of material ordered or per square meter of trench floor compacted.

(a) Using Class I selected fill cubic metre (m3)

(b) Using cement or lime stabilized fill cubic metre (m3)

(c) By compaction only, to 90% of mod AASHTO density square metre (m2)

PA 19.7.2 The unit of measurement for subitems (a) and (b) shall be the cubic metre of material (measured in place after compaction) of each type as ordered by the engineer and as specified. Only material placed within the authorized dimensions shall be measured for payment.

PA 19.7.3 The unit of measurement for subitem (c) shall be the square metre of trench floor/pipe bed foundation compacted as specified where no pipe bedding material is required. Only material compacted within the authorized dimensions shall be measured for payment.

PA 19.7.4 The tendered rates for subitems (a) and (b) shall include full compensation for procuring, furnishing, placing and compacting all materials, for storage of materials, for transport and for provision of all labour and constructional plant required to carry out the work.

PA 19.7.5 The tendered rate for subitem (c) shall include full compensation for the provision of all labour and constructional plant required to carry out the work.

PA 19.8 PIPE BEDDING (BEDDING CRADLE)

PA 19.8.1 Shall be measured per cubic meter (m3) of pipeline laid on completed bedding.

PA 19.8.2 Rates shall be held to include for bringing in approved bedding material within a 10km radius from point of application, for all costs of opening up borrow areas where required, royalties to owners, reinstatement of borrow areas and access roads on completion, bulking, placing into trench, spreading, levelling, compaction and testing of materials.

PA 19.8.3 Extra over rates for use of "Bidim" or similar approved filter cloth and 19 mm crushed stone in waterlogged ground shall be held to include for all materials, placing, compaction, deepening of trench bottoms and everything additionally required to complete the bedding in terms of the specification.

PA 19.8.4 Extra over rates for Class A concrete bedding conforming to SABS 102 shall be held to include for everything additionally required to complete the bedding.

PA 19.8.5 Extra over rates for Class A concrete bedding conforming to SABS 102 shall be held to include for everything additionally required to complete the bedding.

PA 19.8.6 Excavation of sling slots and subsequent backfill and compaction thereof shall be deemed to be included in the tendered rates for placing and completing the pipe bedding.

PA 19.9 SELECTED BACKFILL (FILL BLANKET)

PA 19.9.1 Shall be measured per cubic meter (m3) of pipeline laid and completely backfilled.

PA 19.9.2 Rates shall be held to include for bringing in selected backfill within 10km radius from point of application, for all costs and royalties in opening up borrow areas, reinstatement of borrow areas and access roads on completion, bulking, placing into trench, spreading, leveling, compaction and testing of materials.

PA 19.9.3 Extra over rates for the use of polyethylene sheets or blankets in conjunction with selected backfill of required fineness but with high clay content, shall be indicated as either a plus (+) or minus (-) value. Rates shall be held to include for everything necessary to complete selected backfill up to 300 mm above crown of pipe as per specification.

PA 19.9.4 Extra over rates for the use of approved rock shield in conjunction with backfill which do not meet specified requirements in respect of fineness and clay content shall be indicated as either a plus (+) or minus (-) value. Rates shall be held to include for all expenses in getting rock shield materials approved, its application to approval of the Engineer and everything necessary to complete selected backfill up to 300 mm above crown of pipe as per specification.

PA 19.10 COMMON BACKFILL (MAIN FILL)

PA 19.10.1 Shall be measured per linear meter (m) of pipeline completely backfilled.

PA 19.10.2 Rates shall be held to include for moving of suitable trench spoil from areas where there is a surplus to areas where there is a shortage over a free-haul distance of 10 km, for placing, spreading, leveling and compaction, for bringing back top soil and reinstatement thereof over the trench, for reinstatement of agricultural drains and contours across servitude, for all works required in safeguarding against and prevention of erosion along the servitude, for backfilling around all chambers and other pipeline structures excavated outside the trench payment line.

PA 19.10.3 Extra over rates for common backfill at road crossings shall be held to include for complete reinstatement of road formations and road surfaces in conformity to the specification or the requirements of the roads authority.

PA 19.10.4 Extra over rates for common backfill at stream crossings shall be held to include for complete reinstatement of the natural stream bed and removal of all obstructions created by pipeline construction and which may obstruct or interfere with the natural flow regime of the stream.

PA 19.11 CLEANING OF SERVITUDE

PA 19.11.1 Shall be measured per linear meter (m) of pipeline servitude cleaned on completion of backfilling.

PA 19.11.2 Rates shall be held to include for clearing of the permanent and temporary servitude widths of surplus spoil i.e., excavated materials including rock, debris, rubble, rejected or surplus piping, specials and fittings and transport of same to approved dumping sites or acquired servitudes, within 5 km radius from point where loaded, for reinstatement of ground surface in temporary servitude strip by ripping or otherwise to facilitate re-establishment of vegetation. The spoil dumps should be neatly trimmed and, if required, covered with topsoil 100 mm thick, and grassed.

PA 19.12 LAYING AND JOINTING OF PIPING AND SPECIALS

PA 19.12.1 Shall be measured per linear meter (m) of pipeline laid and jointed.

PA 19.12.2 Rates shall be held to include for site storage, transport and handling of pipes and specials, for all jointing materials, for Contractor's inspection services, for radiography exceeding specified limits and at repairs, for repairs to piping and specials, repairs to linings and coatings, for moulding of flanges and couplings, for prevention of flotation and provision, installation and maintenance of night caps to all open ends of pipes in trenches, for installation of thrust and puddle flanges where required, for maintaining the pipeline, piping and specials, clean and free from contamination, for final painting as specified and for the provision of suitable plant, labour and supervision to transport pipes, specials and fittings up or down very steep inclines along the pipeline route.

PA 19.12.3 Extra over rates for pipe laying and jointing at road and stream crossings shall be held to include for all additional labour, materials, plant, supervision, and inspection required for installation of the piping and specials as per specification and approved drawings and for all limitations imposed on operations and methods of work due to restricted working space or due to restrictions imposed by authorities, high water level etc.

PA 19.12.4 Extra over rates for pipe laying and jointing on steep slopes shall be held to include for all restrictions and limitations imposed by the site for the provision and installation of all anchors and holding down straps, flexible supports.

PA 19.13 RADIOGRAPHIC TESTING OF WELDED JOINTS

PA 19.13.1 The unit of measurement shall be the number of each size of welded joint to be radiographically tested.

PA 19.13.2 The tendered rates shall include full compensation for all personnel, materials and equipment required to carry out the radiographic tests for the full length of each joint.

PA 19.13.3 Payment shall be done for the radiographic testing of welds as specified in Clause PA 18.2. Any increase in tests as result of poor workmanship of the Contractor or retesting of failed tests shall be for the Contractor’s account.

PA 19.14 INSTALLATION OF IN-LINE VALVES, METERS AND FITTINGS

PA 19.14.1 Shall be measured per unit of complete assembly.

PA 19.14.2 Rates shall be held to include for site storage, handling, and transport, for all jointing materials and installation as specified or as per drawings, for oiling and greasing of moving parts, tightening up to of leaking glands and final painting after installation, and for everything necessary to complete installation as per specification or drawings except for construction of chambers which is measured separately.

PA 19.15 PIPELINE OFF-TAKES AND FITTINGS

PA 19.15.1 Shall be measured per unit of complete assembly.

PA 19.15.2 Rates shall be held to include for site storage, handling and transport, for all jointing materials, for

installation of all valves, meters and fittings as per Clause PA 19.12 and for everything necessary to complete the off-take as per specification or drawing, except for construction of chambers which is measured separately.

PA 19.16 CHAMBERS, CULVERTS, AND PIPELINE STRUCTURES

PA 19.16.1 Concrete shall be measured in accordance with SABS 1200GA Clause 8.1.4 - Concrete complete with formwork.

PA 19.16.2 Reinforcement shall be measured in tons nett, and rates shall be held to include for cutting, bending, placing and all brackets, stools and supporting steel.

PA 19.16.3 Miscellaneous built-in steel and iron work like chequer plate covers, cast iron manhole covers and frames, grating, tread irons, locking bars and padlocks, holding down bolts and anchorages bearing finger and pin joints, louvres, ventilators, bar and mesh screens, steel valve supports, ladders etc., shall be measured per unit of complete assembly. Rates shall be held to include for fabrication, corrosion proofing, supply and delivery to site and complete installation.

PA 19.16.4 Manhole covers shall be measured per unit of complete assembly and rates shall be held to include for fabrication, supply, and delivery and complete installation.

PA 19.16.5 Precast concrete paving blocks or slabs shall be measured per square meter area covered and rates shall be held to include for manufacture, supply, laying, finishing off, all foundation preparation and work, concrete or mortar or soil surround or fills and all cut-off walls for erosion protection.

PA 19.16.6 Thrust blocks and anchor blocks shall be measured per cubic meter concrete poured of the class as specified and rates shall be held to include for additional excavation required to meet the required dimensions of each block, for ensuring that the thrust area is undisturbed and sound and meets with the minimum required thrust area, for procuring all materials needed, for mixing, placing and curing the concrete and any other activities required to complete the thrust block or anchor block.

PA 19.17 CONSTRUCTION AND MAINTENANCE OF SERVITUDE ROAD

PA 19.17.1 The unit of measurement shall be the km of servitude road constructed and maintained for the duration of the construction period and during the twelve-month maintenance period. The tendered rate shall include full compensation for all labour and constructional plant required to construct the access road in accordance with the PA 14.5.

PA 19.18 CONNECTING TO EXISTING PRESSURE PIPES

PA 19.18.1 Shall be priced as a lump sum payable for each connection as detailed on the drawings or described in the Schedule of Quantities which must be made and commissioned.

PA 19.18.2 Prices shall be held to include all effort required to locate, expose by hand, removal of end caps, other fittings, or cutting into the existing pipeline, draining the pipeline and dewatering operations, additional excavations, installing the valves and other required specials, repair of damaged coatings and linings, temporary and permanent thrust blocks, testing, subsequent backfill and compaction, and refilling and bringing to pressure of the existing pipeline and any other actions that may be required to complete and

commission the connection. The prices shall also include for liaison with the service owner and other affected local authorities and to comply with their requirements and regulations.

PA 19.18.3 New materials, such as valves, bends, tees, shall be measured and paid for separately.

PA 19.19 FENCING

PA 19.19.1 All fencing, including temporary fencing, palisade fencing and permanent fencing, except reinstatement of existing fences across servitudes with new materials which shall be included in rates for trench excavation, shall be measured in linear meters of fence erected and rates shall be held to include for maintenance, breaking down and removal on completion where applicable.

PA 19.19.2 Gates other than those provided in temporary fences to maintain access for owners, and which shall be included in rates for temporary fencing, shall be measured per unit of complete installation.

PA 19.19.3 Rates shall be held to include for painting as specified.

PA 19.20 HYDROSTATIC TESTING AND DRAINING

PA 19.20.1 Shall be priced as a lump sum payable in proportion to the length of pipeline tested.

PA 19.20.2 Prices shall be held to include for the supply of water, all gauges, recorders, water meters, detection and repair of leaks, supply, installation and removal of bulkheads, blank flanges, thrust blocks and anchors and everything necessary to conduct and complete the test as well as the draining of the pipeline as specified.

PA 19.21 STERILISATION

PA 19.21.1 Shall be priced as a lump sum payable in proportion to length of pipeline completely sterilized.

PA 19.21.2 Prices shall be held to include for the supply of water, chemicals, free residual chlorine indicators, instruments, equipment, re-sterilization after entry and everything necessary to conduct and complete sterilization as specified.

PA 19.22 MARKER BEACONS, BENCHMARKS, TRIANGULATION POINTS AND MARKING

PA 19.22.1 Shall be priced as a lump sum payable on completion of services required in terms of the specification.

PA 19.22.2 Price shall be held to include for hand stamping of brass plates, coding, numbering, lettering and everything necessary to complete as specified.

PARTICULAR SPECIFICATION

PB : MANUFACTURE OF STEEL PIPES AND FITTINGS

CONTENTS

PB1 SCOPE
PB2 MANUFACTURE OF PIPES AND FITTINGS

PB 1 : SCOPE

This specification covers the manufacture and if applicable the delivery of pipes and specials such as bends, tees, etc, inclusive of coatings and linings of the diameters listed below.

The work involved will entail the manufacture, coating and lining as well as delivery to and off-loading on site of cement- mortar lined and fusion bonded medium density polyethylene (FBMDPE) coated plain-ended steel pipes and specials with ends prepared for butt-welding, as listed below.

PB 2 : MANUFACTURE OF PIPES AND FITTINGS

PB 2.1 Material requirements

(i) The steel plate or strip for the fabrication of the pipes shall be manufactured in accordance with American Petroleum Institute (API) Standard 5L and be of the grade as stated in the table below and in the schedule of quantities.

External diameter mm	Wall thickness mm	Steel plate or strip	Approximate total length m	Preferred length of individual pipes m
512	6	API 5L - Grade X42	3200	12.144
309	6	API 5L - Grade X42	4200	12.144

(ii) The place of manufacture of the steel plate and strip shall be subject to the approval of the engineer.

(iii) All steel plates and strip shall be free from seams, cracks, laminations, and other injurious defects.

(iv) The pipe manufacturer shall submit to the engineer the steel maker's certificates covering all steel used. These certificates shall indicate the process of manufacture, the chemical analysis, and the physical properties of the steel except that, at the option of the pipe manufacturer, the physical properties of the steel may be determined from specimens taken from finished pipe.

PB 2.2 Dimensional requirements

(i) Length and mass

The length of individual pipes offered shall be 12 144mm, or as approved by the engineer. The length of pipe supplied shall not vary by more than plus or minus 40 mm.

The mass of the shell shall be calculated on the basis that the mass of steel is 7,843 kg per square metre per mm of thickness.

(ii) Diameter and circumference

The internal and outside diameters and the circumference of the pipes shall conform to the relevant dimensions and tolerances listed in table 1.

Table 1 : Diameter and circumference of steel pipe shells

Internal diameter (shell without lining): 598mm
Outside diameter: 610mm
Diametral tolerance: ± 2mm
Length of ends subject to diametral tolerance : 100mm
Circumference : 1 916mm
Circumferential tolerance : ± 3mm
Wall thickness : 6mm
Nominal wall thickness tolerance : +10% or -8%.
Straightness : < 2 mm for each 3 m in length from a line parallel to the axis of the pipe section

The diametral tolerance is only applicable over the end length given in table 1 measured from each end of the pipe and over the remainder of the pipe out of roundness shall be limited. The maximum outside diameter shall not be more than 1% larger than tabulated and the minimum outside diameter shall not be more than 1% smaller than tabulated.

Forming of the pipe shall be such as to avoid peaks, flats and re-entrants.

(iii) Wall thickness

The nominal wall thickness shall be subject to a tolerance of +10% or -8%.

(iv) Straightness

Finished pipe sections shall be truly straight with walls parallel to the axis of the pipe. Any pipe section with a fault in alignment exceeding 2 mm for each 3 m in length from a line parallel to the axis of the pipe section shall be rejected.

Where two pipe lengths are welded together in the pipe fabrication works, the finished pipe shall be truly straight. Any such pipe with a fault in alignment exceeding 12 mm from a line parallel to the axis of the pipe shall be rejected.

(v) Pipe ends

Pipe ends shall be square to the axis of the pipe, cleanly cut and be free from burrs.

(vi) Pipe ends prepared for field welding

Where pipes are to be joined by field welding, e.g., for sets, bends and special pipes, the ends shall be bevelled to an angle of 30□ ± 5□ measured from a plane perpendicular to the axis of the pipe, and shall include a root face of 2 mm ±

1 mm. The root face of all pipe ends measured across the full diameter of the pipe shall not deviate more than 1,5 mm from squareness to the axis of the pipe.

(vii) Trueness and finish of pipes

All pipes shall be truly cylindrical and free from injurious surface defects, laminations, and dents. Any pipe that has flattened areas in the steel wall shall be rejected. Helical forming of strip at the beginning and end of coils and across butt-welds joining coils shall be accurate and true. Flat areas, re-entrants, bamboo effects or dents etc will not be accepted. Special precautions shall be taken to avoid lack of trueness resulting from variations in width of steel strip. All weld spatters shall be removed by chipping or grinding.

(viii) General

Non-compliance with any of the material or dimensional requirements shall be a cause for rejection of the pipe by the engineer.

PB 2.3 Fabrication requirements

(i) General

The pipes shall be manufactured exclusively by such makers as are approved by the engineer and at only one works unless otherwise agreed to by the engineer in writing.

Pipe sections shall be consecutively numbered from the commencement of fabrication. Each pipe section number shall be punched on the inside of the pipe approximately 20 mm from a longitudinal weld at each end of the pipe and each circumferential weld made at the pipe fabrication works to join pipes shall be marked with the welder's identifying stamp.

The method of manufacture of the pipes shall be submitted for approval by the Engineer. All welding procedures shall be approved by the engineer. All welders and welding operators employed on the work shall have passed an approved qualification test. The contractor shall maintain a record of the procedure, performance,and qualification tests.

Full details of welding electrodes and fluxes, where applicable, shall be submitted to the Engineer for approval.

(ii) Forming

Pipes shall be fabricated from plates or strip formed, rolled or pressed to a cylindrical form and with one or more longitudinal or circumferential seam(s), or from strip formed or rolled to a cylindrical form with a helical seam. Circumferential joints shall be at least 1,5 m apart, and the longitudinal welds of mating sections shall be spaced at least 30□ apart.

Coil jointing welds in the strip used in the forming of spiral-weld pipes shall be not less than 300 mm from a pipe end. There shall be no perceptible radial offset (misalignment) of the plate edges in the weld seams.

(iii) Welding

All welding shall be electric fusion welding acceptable to the engineer and shall comply with the following requirements:

1. Uniformity of appearance: All welds shall be substantially uniform in appearance and shall show full fusion and penetration throughout their lengths.

2. Undercut: Welds shall be substantially free from undercut and, if present, the depth of the undercut shall not exceed 12,5% of the nominal wall thickness or 1 mm, whichever is the lesser in depth, and the aggregate length of undercut in any 1 m length of welding shall not exceed 50 mm.

3. Weld bead tolerances: The outer weld bead shall not exceed a height of 3 mm for a nominal wall thickness of 10 mm and under and shall not exceed a height of 5 mm in pipes having thicker walls. The inner weld bead shall not project more than 1 mm and all excess weld metal shall be removed by grinding to the satisfaction of the engineer. The inner weld beads of a pipe that is to receive an epoxy coating shall have a smooth profile free from grooves, pin holes, pits, sharp edges, etc and shall merge smoothly into the parent metal. In butt welds made from one side only, a root groove may be present provided that it has a rounded outline and does not penetrate below the level of the adjacent surfaces of the parent plate.

4. Freedom from defects: The weld, heat affected zone and surrounding parent metal shall be free from cracks, porosity cavities and trapped slag.

5. Transverse tensile strength of welded joint: The welded joint shall have an ultimate tensile strength equal to at least 95% of the minimum tensile strength of the parent plate.

6. Resistance to bending: Test specimens prepared and tested in accordance with subclause PB2.4 except at the arrises, shall show no crack (on the outer surface) greater in length than 5 mm in any direction.

PB 2.4 Welding tests

(i) Examinations and testing of welds shall comprise the following:

1. Transverse tensile and guided bend tests carried out on test pieces cut from the welded seam : The tests shall be carried out in accordance with clauses 4.4, 4.5, 4.11, 4.12 and 4.16 of API Standard 5L. Should one of these test samples fail to comply with the relevant requirements, two further specimens of the same type shall be prepared and subjected to the relevant test. If one or both of the retest specimens fail to comply with the relevant requirements further retests shall be carried out until ten consecutive specimens comply with the relevant requirements.

2. Radiographic examination of longitudinal and circumferential welds: Cracks, lack of complete penetration or lack of complete fusion shall be considered injurious defects. The standard for acceptance of minor imperfections such as slag inclusions or gas pockets shall be that specified in clauses 9.2 to 9.13 inclusive of API Standard 5L.

   Any weld rejected as a result of radiographic examination may be repaired at the option of the contractor, and such repair shall be carried out in accordance with subclause PB2.6. The repaired weld shall be re-examined. Radiographic re-examination shall extend for the full length of the weld on the plate in which the repair has been carried out.

(ii) General

The facilities and equipment for testing and examining welds that are available at the pipe fabrication works shall be subject to approval by the Engineer. The cost of all tests and repairs to a pipe cut to obtain test strips shall be borne by the contractor.

PB 2.5 Number and type of welding test

The following welding tests shall be carried out:

(i) Transverse tensile and guided bend test on the first pipe section of each item then on one pipe section in each 500 m of each item.

(ii) Radiographic examination of the full length (100%) of the longitudinal and circumferential welded seams of the first pipe to prove the procedures. If unsatisfactory results are obtained the successive pipe(s) shall be radiographically examined as detailed above until such procedures are acceptable. Thereafter the full length of all welds on one pipe from each lot of fifty pipes shall be radiographically examined. Should the quality at any time fall below the standard required by the contract then successive pipes shall be radiographically examined until a satisfactory procedure has been re-established.

(iii) Radiographic examination of full width (100%) of each coil-joining butt weld for helically formed pipe.

(iv) Radiographic inspection for a length of 400 mm from each end of every longitudinal welded seam and the full length (100%) of every circumferential welded seam made to join pipes into a double length.

PB 2.6 Repair of injurious defects

Repairs of a welded seam shall be permitted during the process of manufacture.

Where repairs are required the defective weld metal shall be cut out, and the parent metal prepared by grinding and re-welded to the satisfaction of the engineer.

The repair procedure and performance, and welders employed on repairs shall be as stated in Appendix B of API Standard 5L. Each repair weld shall be marked with the welder's identifying stamp.

When the repair has been made the full length of the repair shall be examined radiographically.

On discovery of reject welds the engineer may, at his discretion, call for additional radiographic examination until it is shown that the necessary standard is being maintained.

Should a weld repair be required on a pipe subsequent to hydrostatic testing the pipe shall be retested to the test pressure specified.

PB 2.7 Hydrostatic testing of pipes at the factory

Prior to the application of protective coatings and linings, all pipes shall be subject to an approved hydrostatic test to a test pressure determined as follows:

$P = \frac{2\,000\ t\ fD}{}$

Where:

P = the test pressure in kPa, t = wall thickness in mm,
f = 85% of the guaranteed minimum yield strength in MPB for the steel plate, and D = outside diameter of the pipe in mm.

Hydrostatic testing shall not be carried out until all aspects of fabrication have been completed.

The pressure shall be applied steadily by approved means and maintained without variation sufficiently long for proof and inspection. While under the test pressure the pipe shall be struck smartly and repeatedly along its length with a hammer of a mass of not less than 1 kg. The description of the testing apparatus shall be subject to approval by the Engineer.

Should water sweat or ooze from any part or any defects of any nature be discovered the pipe shall be emptied and the defects made good. The pipe shall then be tested again. Should a pipe, after repair, fail to pass the second hydrostatic test the engineer may order its rejection.

The fact that any pipe may have passed the hydrostatic test at the works shall not exempt the contractor from his liabilities under the general conditions of contract.

If a pipe fails to pass any of the above tests it shall be rejected but the engineer may permit repairs or alterations to be made to enable the pipe to pass the test.

The engineer may require one or more pipes to be tested to destruction. If practicable the engineer may require the contractor to repair the pipes and retest them. The cost of repairs will be paid by the employer as an extra to the contract.

PB 2.8 Protective coatings

Protective coatings shall comprise:

(i) A coherent lining bonded to the inside surface of each pipe in order to prevent corrosion of the inner pipe surface and reduce wall friction,

(ii) A coherent layer bonded to the outside surface of each pipe in order to prevent corrosion of the outer pipe surface.

Before being placed in the pipe trench and filled with water the pipes may be subjected to temperatures ranging from a minimum of approximately -7□C in winter to a maximum of 35□C in summer.

The materials for the internal coating shall be suitable for the lining of steel pipes, shall provide protection against corrosion and shall not impair the quality of the water passing through the pipeline.

Epoxy coating material shall have the approval of the Department of Health Services and Welfare and shall comply with the requirements of section 3 and column 2 of table 1 of SABS 1217 including the requirements of column 6 of table 1. The contractor shall undertake to ensure that samples of each batch of material used for the internal coating of pipes, specials, sets and bends to be supplied under the contract, are submitted to the South African Bureau of Standards for "chemical fingerprinting". The contractor shall further undertake that should the supplier of the epoxy material contemplate a change in the formulation of the material, further samples of the proposed formulation shall be submitted to the South African Bureau of Standards and the Department of Health Services and Welfare for re- certification and approval. A copy of each "chemical fingerprint" statement and each certificate of approval issued, during the course of the contract, by the South African Bureau of Standards and/or the Department of Health Services and Welfare shall be submitted to Magalies Water for its approval. A copy of the Board's written approval shall subsequently be handed to the engineer and no pipes shall be approved unless this approval has been accepted by the engineer.

PB 2.9 Surface preparation

Oil and grease shall be removed before shot blasting or wire brushing by scraping, by washing and flushing with an approved solvent such as white spirit and wiping with clean cloths.

Welds shall be ground to a smooth profile with a radius contour of not less than 1 mm. No metal shall be removed below the depth of the surrounding steel plate. Weld spatter shall be removed by chipping or grinding.

The interior of pipes, specials, sets and bends that will receive the epoxy lining system shall be cleaned by steel shot blasting and will not be accepted unless the operation provides a roughened surface with a degree of cleanliness equivalent to BSa 2½ of Swedish Standard SIS 05 59 00. The surface profile amplitude shall have an average which does not exceed 0,1 mm and no individual reading shall exceed 0,15 mm.

All surfaces of pipes, specials, sets and bends that will receive the bituminous coating system shall be cleaned by steel shot blasting and will not be accepted unless the operation provides a roughened surface with a degree of cleanliness equivalent to BSa 2½ of Swedish Standard SIS 05 59 00. The surface profile amplitude shall have a minimum value of 0,05 mm and shall not exceed 0,2 mm.

The method of preparation and cleaning of the steel pipe shell prior to applying the protective coatings shall be approved by the engineer.

PB 2.10 Internal epoxy lining

The internal surface shall be lined with an approved solvent free epoxy coating (material) applied by a machine designed for the hot application of such material. The machine shall be equipped to heat the two components to the temperature recommended by the coating manufacturer and control the temperature thermostatically within 5□C or better and to accurately meter the components to the mixing head in the prescribed proportions. The components shall be completely mixed and hydraulically sprayed on to the surface. The design shall be such as to prevent gelation of the material in the equipment. The film thickness shall have an average of not less than 300 µm and the minimum thickness at any point shall be 250 µm. Particular care shall be taken to adequately coat weld seams and edges.

PB 2.11 Internal cement-mortar lining

(i) Specification

The internal surface shall be lined with a cement-mortar lining, which shall be applied in accordance with the American Water Works Association Specification C205-80 or as amended except where the Specification C205-80 is at variance with the requirements of this specification.

(ii) Thickness

The thickness of the cement-mortar lining shall be 12 mm, subject to a tolerance of ± 2 mm.

(iii) Roundness of pipe ends

The pipe ends shall be held truly round during placing and setting of the cement-mortar lining.

(iv) Materials

Cement shall be freshly manufactured ordinary Portland cement in compliance with SABS ENV 197-1.

Sand shall consist of inert granular material and the grains shall be durable and uncoated. The sand shall be well graded and pass a 1.5 mm mesh screen. Sand shall be free from injurious amounts of clay, lumps, shale, soft or flaky particles, mica, loam, oil, alkali or other deleterious substances. The total mass of such substances shall not exceed 3%. The source of the sand shall be approved by the engineer.

Water shall be clean and free from injurious amounts of mud, oil, organic materials, or other deleterious substances. Admixtures may be used provided the additive will not injuriously affect the water quality and written approval has been obtained from the engineer. The contractor shall submit test data to substantiate admixture performance.

The proportions shall be determined from the characteristics of the aggregate. Measurement of the materials shall be by mass and the water: cement ratio shall be controlled and kept to a minimum, with an allowance being made as necessary for the most effective machine operation and adhesion of mortar to the pipe.

PB 2.12 External fusion bonded medium density polyethylene coating

The external surface shall be coated with an approved fusion bonded medium density polyethylene coating, such as Sintakote II or approved equivalent. The coating shall be applied in accordance with AS 4321: “Fusion-bonded medium-density polyethylene coating and lining for pipes and fittings”.

The pipe shall be placed into a preheat oven where the temperature of the steel is raised to processing temperature, after which it shall then be picked up and dipped into a fluidised bath of polyethylene powder. On contact the powder shall melt and fuse to the pipe’s external surface. The pipe shall be rotated and held in the bath until the required coating thickness is reached.

The coating thickness shall not be less than stated below:

Pipe OD (mm) Minimum thickness (mm)

Up to and including 273mm diameter : 1.6mm Over 273mm diameter up to and including 508mm diameter : 1.8mm Over 508mm diameter up to and including 762mm diameter : 2.0mm Over 762mm diameter : 2.3mm

PB 2.13 Extent of coating

The coatings shall be cut back cleanly from the ends of the pipe for a distance of 100mm. The engineer reserves to himself the right to modify the extent of the coating if required.

PB 2.14 Welding into double lengths

Two pipes may be welded into a double length by setting and lining up the pipes on rollers and jointing the pipes by butt welding. The welding shall comply with subclause PB2.3(iii) and the completed weld shall be tested over its full length in accordance with subclauses PB2.4 and PB2.5.

When the jointing weld has been accepted by the engineer the internal and external coatings shall be made good after cleaning off all slag, weld spatter and damaged coating material.

PB 2.15 Completing coatings at double length joint

FBMDPE coating

Following the completion of welding the weld area shall be cleaned in accordance with subclause PB 2.9. A radiation-cross-linked polyethylene modified wrap-around heat-shrinkable sleeve not less than 425mm in width shall then be applied in accordance with ANSI/AWWA C216 and the sleeve manufacturer's recommendations.

After preheating, a thin film of Denso WPC primer shall be applied to any visible bare steel and onto the FBMDPE coating for a distance of 100 mm. The sleeve shall overlap the FBMDPE coating for a minimum length of 100 mm on either side of the coating.

The specified preheat and postheat is necessary to ensure satisfactory bonding of the sleeve. A roller shall be used to eliminate voids from under the sleeve. The repair shall be visually inspected to ensure that it is in intimate contact with the pipe and that a bead of mastic has exuded from each end of the sleeve for the full pipe circumference. If this is not in evidence additional heating shall be required.

PB 2.16 Examination of coatings

After the application of the coatings each pipe shall be examined by the contractor in the presence of the engineer both visually and by means of a thickness meter and a Holiday detector of the correct type and rating for the particular coating system. Insufficient coating thickness and Holidays revealed shall be marked with chalk and repaired to the satisfaction of the engineer. The equipment that will be available to carry out Holiday detection shall be subject to approval by the engineer.

On one pipe in each batch of fifty pipes the contractor shall carry out, in the presence of the engineer, the following tests in accordance with the test methods set out in SABS 1178:

Section 7.3.2 : Peel test
Section 7.3.3 : Condition of bitumen

PB 2.17 Repair of external coating

(i) FBMDPE coating:

Small areas of damage to a FBMDPE coating can be repaired by the application of a patch whereas larger areas may be repaired by the application of a heat shrinkable polyethylene sleeve. Oxygen and acetylene shall not be used to heat the coating as heating in this way can degrade the MDPE material.

PB 2.18 Specials

Specials, such as tees, bends, tapers, etc, shall comply with the requirements of clause PB2 insofar as they are applicable. They shall be reinforced such that the stress in the fitting under the prescribed test pressure does not exceed 55% of the yield stress of the steel. They shall be protected in accordance with sub-clauses PB2.8 to PB2.17 inclusive except that manual application may be carried out where application by machine is not possible.

Specials shall where practicable be submitted to the hydraulic test specified. Where the hydraulic test is not practicable, the paraffin test laid down in clause 17 of BS 534 shall be applied. In addition to the paraffin test, a radiographic examination of the full length of all welds shall be carried out. The results of all such examinations must meet with approval of the inspector.

PB 2.19 Pipe records

The contractor shall maintain a record, in an approved form, showing the pipe serial and delivery numbers, the steel cast number for the plate used in each pipe section, the date of fabrication and hydrostatic testing together with the actual test pressure and details of defects and subsequent repairs. Each record shall be signed by the engineer and shall be available for reference by the engineer during all working hours. At the end of the contract, all records shall be delivered to the engineer.

PB 2.20 Marking

The contractor shall ascertain the category of steel plate from which the pipe is fabricated from the internal stamped identifying marks and apply a 100mm wide painted band of the relevant identifying colour around the end of the pipe. In addition a second band, 50mm wide, denoting the wall thickness of the steel plate shall be painted around the end of the pipe. The details of the painted identifying bands shall be in accordance with the standard colour code for marking steel pipes.

The diameter in mm, overall length in m, mass in kg and the words "SEKHUKHUNE DM" shall be painted on the outside of each pipe. The reference number on the delivery schedule, which need not be the same as the pipe number, shall be painted at each end and in the middle of the pipe on the outside. All lettering shall be not less than 100 mm high.

PB 2.21 Delivery pipes

The contractor responsible for the supply and delivery of the pipes shall make all arrangements for transporting the pipes from the place of manufacture to the site. The tendered rates for pipes shall include for the transport from the place of manufacture.

The contractor shall ensure that the work is not delayed due to lack of pipes and fittings by placing orders with the suppliers as soon as possible after the acceptance of his tender. The contractor shall immediately notify the engineer in writing should the actual time of delivery exceed the time of delivery as tendered. No extension of time shall be considered should the contractor fail to comply with any of the two requirements as stated.

PB 2.22 Storage of pipe at place of application of protective coatings

A pipe that has been completed and has passed the final inspection shall be stored at the place of coating until it can be accepted on the site. The pipe shall be placed on approved supports in a demarcated area which has been cleared of all vegetation and treated with an effective weed killer. The support shall be arranged so that the bearing area is adequate to prevent damage to the external coating. Bags filled with sawdust shall not be used to support pipes.

Each pipe end shall be enclosed with a white polyethylene sheet cover secured to the pipe by a metal strap. The cover shall be perforated to allow flow of a small quantity of air through the pipe.

During inclement weather or for any other reason that may prevent acceptance of pipe deliveries at the site, the engineer may instruct that pipes be stored at the place of coating.

PB 2.23 Protection of pipe during transporting

The pipe shall be protected against damage at all stages during its transport from the works to the site of delivery. The pipe shall be lifted by means of broad band slings and the use of chains, wire ropes, etc will not be permitted. Wooden chock blocks at least 150mm wide and suitably padded for the pipes to rest on shall be provided on each transport vehicle.

The manufacturer shall ensure that the ends of the pipes are properly protected from damage during all stages of handling and transporting of the pipes. The cost of such protection shall be included in the tendered rates.

PB 2.24 Repair of damaged pipes

When pipes are delivered to site the contractor shall inspect the pipes for damage before off-loading commences. Once the contractor has satisfied himself that pipes are undamaged and suitable for installation, he shall arrange for off-loading of the pipes and take, on behalf of the Employer, ownership of the off-loaded pipes. All damage to a pipe and/or its internal and external coating that may subsequently occur shall be repaired at the expense of the Contractor.

PARTICULAR SPECIFICATION PC SUPPLY OF VALVES CONTENTS

PC 1 SCOPE
PC 2 GENERAL REQUIREMENTS PC 3 GATE VALVES
PC 4 BUTTERFLY VALVES PC 5 REFLUX VALVES
PC 6 MEASUERMENT AND PAYMENT

PC 1 SCOPE

This specification covers the design, manufacture and supply of gate valves, butterfly valves, air valves and reflux valves for use in pressure pipelines.

PC 2 GENERAL REQUIREMENTS

PC 2.1 Design Pressure

Each valve is assigned a design pressure elsewhere in these documents and shall be tested in relation to these pressures as specified. The design pressure shall be hard stamped on the edge of a flange of each valve.

PC 2.2 Test Pressures

Valve bodies shall be subjected to closed-end tests at pressures of 1,5 times the design pressure. Test pressures shall be maintained for not less than 5 minutes duration and valve bodies shall be watertight in all respects.

Complete valves shall be subjected to open-end tests at pressures of 1,5 times the design pressure for material strength and soundness. Drop tightness is not a requirement for this test.

Complete valves shall be subjected to open-end tests for drop tightness at pressures from zero (0) to 1,0 times the design pressure. Valves shall be drip tight over the complete- range of pressures.

PC 2.3 Other tests

The integrity of the bodies of all valves to be supplied under this contract shall be subjected to ultrasonic testing and a certificate shall accompany each valve or batch of valves to certify that the valve has been tested and found to be sound.

PC 2.4 Design Life

All valves and appurtenant fittings shall be designed for a useful life of 45 years under the operating conditions indicated elsewhere in the documents.

PC 2.5 Flanges

Valves shall be flanged and drilled off-centre to B.S. 4504 or SANS 1123, unless otherwise stated elsewhere. Flanges shall have flat joint faces machined in accordance with B.S. 4504 or SANS 1123. All flange faces to have a gramophone finish.

Sufficient clearance shall be allowed between the body and the flange to enable flange bolts to be tightened. Tapped holes shall only be permissible where stiffening ribs interfere with bolting.

PC 2.6 Jointing Materials

Valves shall be supplied complete with bolts, nuts, washers and gaskets for joining up to adjacent mating flanges. Bolts shall be of sufficient length for at least 2 and maximum 4 screw threads to protrude outside nuts when assemblies are fully tightened.

PC 2.7 Contact between Dissimilar Metals

Suitable insulation materials shall be used on the contact faces between dissimilar metals of which the potential difference exceeds 0,3 volts.

PC 2.8 Painting of Valves

A pipe lining epoxy shall be used to coat all internal and external cast-iron, cast-steel and mild steel components of valves in accordance with SANS 1217 with the following provisions:

(a) Only non-metallic abrasives shall be used for surface preparation. It shall not be recycled after the first use. All blow/deep holes in cast iron surfaces shall be drilled out and filled with solvent free epoxy filler before applying the epoxy coating(s).

(b) Minimum dry film thicknesses: Internal 300 micrometers. External 300 micrometers. Flange faces 125 micrometers.

(c) All internal surfaces shall be pinhole free.

PC 2.9 Inspection

The inspection of valves shall be carried out by the Engineer or his representative in the manufacturer's works. The Supplier or Manufacturer shall give at least 2 weeks prior notification to the Engineer of the dates of inspection.

The Manufacturer or Supplier shall provide all labour, materials and facilities required for inspection free of charge.

The Engineer's inspection shall in no way relieve the Supplier or Manufacturer from any of his obligations to design, manufacture and supply valves of superior quality and workmanship in accordance with the specification.

PC 3 GATE VALVES

PC 3.1 Type

Valves shall be double flanged, wedge gate or RSV, internal (non-rising) spindle types of which gates shall be completely clear of the waterway in the fully open position.

PC 3.2 Standards

SANS 664 and SANS 191 shall apply as and where applicable and where not in contradiction to this specification.

PC 3.3 Opening and Closing

Closure of valves shall be by clock wise rotation of spindles or hand wheels.
All gate valves shall be capable of being opened or closed under an unbalanced pressure equal to design pressure.

The effort required on hand wheels to open or close valves under these conditions shall not exceed 250 N in the case of valves up to 300 mm NB and shall not exceed 400 N in the case of larger valves.

PC 3.4 Materials

PC 3.4.1 Valve Bodies and Gates

Valve bodies and gates shall be of cast-iron or cast-steel. Cast-iron shall conform to SANS 936 grade SG38/SG42 or SANS1034 grade 300 minimum. Cast-steel shall conform to BS3100. Test specimens shall be submitted on request free of charge.

PC 3.4.2 Other Valve Components

Spindles shall be of high strength stainless steel.

Body and gate sealing rings shall be of stainless steel, bronze or zinc-free gunmetal, unless otherwise specified because of the nature of the water.

Gate position indicators, i.e. marking plates and needles shall be of cast aluminium or cast brass.

Channel guides and shoes shall be in bronze or zinc-free gunmetal or stainless steel as specified in the Schedule of Quantities.

PC 3.5 Construction

PC 3.5.1 Body

The body shall be of rugged design with substantial ribs to minimize distortion under pressure where necessary. Where gearing is provided, bodies shall be designed and manufactured to withstand any additional stresses with an ample margin of safety.

PC 3.5.2 Gate

One face of the gate shall be marked, corresponding to a similar mark on the body, to ensure correct replacement after removal. The gate shall operate satisfactorily under the conditions specified.

PC 3.5.3 Sealing faces

Body and gate seals shall be of design and construction such that would prevent seals becoming loose or water passing behind seals under all conditions of operation and test. This feature must be proved at tendering stage by suitable drawings and documentation.

The leading edges of sealing rings shall be slightly chamfered.

PC 3.5.4 Spindles and hand wheels

The spindle thrust collar shall bear against a ball thrust bearing of approved design, details of which shall be furnished at tendering stage.

Provision shall be made for glands to be repackable under pressure without shutting off the water. Unless otherwise specified all valves shall be fitted with caps complying with SANS 664.

PC 3.5.5 Gearing

Gears shall be robust and machine cut and mountings shall be of substantial design and manufacture.

All gears with ratios 1:3 and lower shall be provided with easily replaceable shear pins to prevent damage to the valves if excessive force is applied. A spare pin shall be attached to each valve.

All lubricating points shall be fitted with nipples for grease-gun lubrication.

PC 4. BUTTERFLY VALVES

PC 4.1 Type

Valves shall be double flanged, full bore types. Wafer types shall not be acceptable. Valves shall be capable of operating at any opening without variation of disc position and there shall be no flutter of the disc.

PC 4.2 Standards

B.S. 5155 shall apply as and where applicable and where not in contradiction to this specification.

PC 4.3 Opening or Closing

Closure of valves shall be by clock wise rotation of hand wheels.

All valves shall be capable of being opened or closed under an unbalanced pressure equal to design pressure. The effort required on hand wheels to open or close valves under these conditions shall not exceed 400 N.
Discs shall close with a positive action with no possibility of slamming shut during any stage of the closing operation.

Bottom part of disc shall open in downstream direction.

PC 4.4 Materials

Valve bodies shall be cast-iron or cast-steel or may be of fabricated steel construction. Cast-iron shall conform to SANS 936 grade SG38/SG42 or SANS 1034 grade 300 minimum. Cast steel shall conform to BS3100. Steel shall conform to BS4360 grade 43A

Discs shall be of cast-iron or cast-steel to the above requirements. Test specimens shall be submitted on request free of charge.
Disc shafts or stub-shafts shall be of high strength stainless steel conforming to AI.S.I. 431 or equivalent and shall be attached to valve discs by means of stainless steel securing elements.

Resilient seals shall have non-weathering, non-sticking, long life properties and shall be compatible with the quality of water to be conveyed.

Resilient seal securing elements and seal seats and its securing elements shall be of stainless steel.

PC 4.5 Construction

PC 4.5.1 Body

Hubs for shaft-bearing housings shall be integral with the valve body.
Valve bodies shall have adjustable mechanical stops to prevent over-travel of the valve disc in the open or closed position. These stops may be incorporated in the actuator.

PC 4.5.2 Disc

Discs shall be a single casting of approved hydrofoil section and smooth continuous surfaces. The maximum combined stresses in the disc shall not exceed 20 % of the minimum yield stress of the material used when the specified unbalanced pressure is applied on any of the two sides.

PC 4.5.3 Seals and seats

Valve water seals shall be one of the following types:

(a) A resilient seal fixed to the edge of the disc by securing elements and a stainless steel seat non resilient seal fixed onto the body,

(b) a resilient seal fixed to the body of the valve and the edge of the disc protected by a stainless steel insert fixed in the edge of the disc to act as seat (non-resilient seal).

The profiles of seats shall be smooth and continuous and shall provide adequate "lead-in" for the resilient seal during closure of the disc.

Seals and seats shall be of a design which would prevent same of becoming loose or would permit passage of water under seals or seats during all conditions of operation and test.

PC 4.6.4 Shafts

Shafts shall be continuous or may be of the stub-shaft type. If of the stub-shaft type, each stub shaft shall extend into the disc hub for a distance of at least 1,5 shaft diameters.

Shafts shall be attached to discs by means of keys, dowel pins, taper pins or any combination of the three and the connection shall be designed to transmit shaft torque equivalent to at least 75 % of the torsional strength of the shaft. Dowel and taper pins shall be mechanically secured.

PC 4.6.5 Bearings

Sleeve type bearings shall be fitted in the hubs in the valve body.
These bearings shall be self-lubricating with a proven record of dependable operation of not less than 5 years.

Each valve shall be fitted with at least one adjustable thrust bearing set to hold the disc securely concentric with the body seat or seal.

PC 4.6.6 Stuffing boxes

Stuffing box assemblies shall be such that the packing can be adjusted or replaced without disturbing any part of the valve or operator assembly.

PC 4.6.7 Position indicators

Each actuator shall be equipped with accurate indicators to show clearly the fully open or closed positions and the 1/4, 1/2 and 3/4 intermediate open positions.
Indicators shall be of robust, rigid and corrosion resistant design with all markings embossed.

PC 5. REFLUX VALVES

PC 5.1 Type

Valves shall be double flanged for horizontal installation in pipelines to minimize reflux action and to reduce water hammer in rising mains and shall be one of the following types as specified in the

Schedule of Quantities:

(a) Single sloping swing door for sizes up to 400 mm N.B.

PC 5.2 General Requirements

The valves shall have minimum hydraulic resistance, shall not be subject to gate or disc flutter and shall give rapid non-slam closure on reversal of flow. Preference shall be given to design which allows removal of doors or discs for inspection of doors or discs and seals without removal of the valve assembly from line. Valves shall be free from external moving parts.

PC 5.3 Materials

Valve bodies shall be of cast-iron or cast-steel. Cast iron shall conform to SANS 936 grade SG38/SG42 or SANS grade 300 minimum. Cast-steel shall conform to BS 3100.

Doors and discs shall be of zinc-free gunmetal or cast-steel to the above requirements. Test specimens shall be submitted on request, free of charge.

Swing door or disc hinge spindles shall be of high strength stainless steel conforming to A.I.S.1. 431 or equivalent.

Valve body seats and sealing faces on doors or discs shall be of stainless steel, zinc-free gunmetal or bronze or nickel.

PC 5.4 Construction

PC 5.4.1 Body

Bodies shall be of sound and robust design and shall be shaped to give the minimum change in waterway.

Designs of bodies and body seals shall be free from pockets to cause eddies or to accumulate debris. Special care shall be taken that foreign objects like bolts cannot lodge themselves in pockets on the downstream side of body seats and thereby prevent doors from closing fully.

Access openings and covers shall be well designed and creation of stress raisers shall be prevented.

PC 5.4.2 Doors and discs

Doors and discs shall be cast as a unit with integral cast hinge lugs.

Doors and discs shall operate freely, but shall be restricted in its travel by the provision of substantial stops fitted with approved rubber facings to prevent wear due to metal contact. The rubber facings shall be vulcanised onto the metal and secured by corrosion resistant countersunk screws. Details shall be submitted with tenders.

The doors or discs shall have continuous hinge spindles which shall be supported at their ends in substantial bearings.

Each spindle is to be extended through a stuffing box on one side of the body only and a pointer is to be fitted to the extended spindle so that the open and closed positions of doors or discs are indicated on an embossed brass or cast-aluminium indicator plate.

PC 5.4.3 Sealing faces

Sealing faces shall be securely fixed with corrosion resistant elements or shall be deposit welded with stainless steel.

Faces shall be accurately machined and finished to meet the requirements of Sub-clause 2.2.

PC 5.4.4 Bearings

Main bearings shall be external and accessible without emptying or removal from line of the valve body.

Bearings shall be of substantial design and shall be designed to take the unbalanced thrust on doors or discs in the open-ended test for material strength and soundness.

Bearings shall have a long life and retain a low coefficient of friction. Any possibility of bearings becoming tight during service or due to ageing shall be eliminated.

Where possible, bearings shall be water lubricated. Full particulars of type and construction of bearings shall be submitted at tendering stage.

PC 6 MEASUREMENT AND PAYMENT

Valves shall be measured and paid for as per payment references included in Particular Specification PA – Construction of Steel Pipelines

PC TRIMMING OF SITE

PC1 SCOPE

This work shall consist of the finishing of the entire site affected by the Contractor's operations before the issue of the Completion Certificate.

PC2 REQUIREMENTS

After completion of the work covered by this Contract, the entire area affected by the Contractor's operations shall be finished off and cleared up and all loose rock shall be removed, if required, and disposed of as directed by the Engineer.

Under no circumstances shall the Contractor use machines for trimming.

All loose stones, roots or other waste matter exposed on fill or excavation slopes, which are liable to become loosened shall be removed and all debris and muck from clearing operations shall be disposed of and the area affected by the Contractor's operations and all camp sites left in a neat and presentable manner.

All false work, temporary supports and structures, casting yards or platforms and equipment shall be removed from the site and from all ground occupied by the Contractor in connection with the work. All parts of the work and adjacent ground shall be left in a neat and presentable condition, all to the satisfaction of the Engineer.

PC3 MEASUREMENT AND PAYMENT

Measurement and payment for complying with the above requirements will not be made separately, and would be regarded as being provided for in full by relevant payment items under 1200 A - General.

PD MAINTENANCE

PD1 MAINTENANCE DURING CONSTRUCTION

From the time of taking over the site by the Contractor, as set out in the Special Conditions of Contract until the acceptance of the work and the issue of the Completion Certificate, the Contractor shall be responsible for the maintenance of the work and shall rebuild, repair, restore and make good at his own expense all injuries or damages to any portion thereof whether occasioned by the action of the elements or any other cause.

PD2 MAINTENANCE OF COMPLETED WORK

Periods of Maintenance

The periods of maintenance for each completed section of work shall extend for twelve months from the time of acceptance of the work and the issue of the relevant Completion Certificate for that section of the work as the case may be as set out in Clause 5.3 of the General Conditions of Contract.

PD2.1 Work during Period of Maintenance

The Contractor shall be responsible for the repair at his own expense, of all defects in any of the works constructed by him, or affected by him during construction, all in terms of Clause 53 of the General Conditions of Contract.

PD3 MEASUREMENT AND PAYMENT

Measurement and payment for maintenance as described above shall be deemed to be included in the prices tendered and paid for the various items for which payment is made in terms of this Contract and such prices shall be full compensation for the supply of all supervision, labour, materials, equipment, plant and work necessary for the maintenance thereof.

The retention monies as set out in the General Conditions of Contract, Clause 49 (3) shall be released only upon Final Settlement of the Contract as set out in Clause 52 of the General Conditions of Contract

PE CONTINGENCIES

PE1 CONTINGENCIES

An amount to be spent in part or in whole at the complete discretion of the Engineer and subject to approval by the client. This amount shall not form part of the 15% as is defined in Clause 50 of the General Conditions of Contract

PLI: Particular Specification for Generic Labour-intensive Specification

PLI: PARTICULAR SPECIFICATION FOR GENERIC LABOUR-INTENSIVE SPECIFICATION

B 1231 LABOUR BASED CONSTRUCTION METHODS

Bidders must take into consideration that the following works may only be constructed using labour-based construction methods:

a) Excavation to expose existing services.
b) Preparation of bedding material for water pipes.
c) Laying of pipes.
d) Installation of pipe markers
e) Installation of Gabions

Where Bidders propose to use additional labour-based methods, the methods must be stated as well as the activities. It will reflect positively on the Bidder's bid if he should use more labour-based methods.

PLI 1 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

PLI 2 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.

PLI 3 Hand excavatable 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 a 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 100 mm.

(c) 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 a 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 insitu 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 thumb-nail; slight indentation produced by pushing geological pick point into soil; cannot be moulded by fingers.
Very dense	High resistance to repeated blows of a geological pick.	Very stiff	Indented by thumb-nail with difficulty; slight indentation produced by blow of a geological pick point.

PLI 4 Trench excavation

All hand excavateable material in trenches having a depth of less than 1,5 metres shall be excavated by hand.

PLI 5 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 stampers

(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 10 mm 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.

PLI 6 Excavation

All hand excavateable material including topsoil classified as hand excavateable 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.

PLI 7 Clearing and grubbing

Grass and small bushes shall be cleared by hand.

PLI 8 Shaping

All shaping shall be undertaken by hand.

PLI 9 Loading

All loading shall be done by hand, regardless of the method of haulage.

PLI 10 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.

PLI 11 Offloading

All material, however transported, is to be off-loaded by hand, unless tipper-trucks are utilised for haulage.

PLI 12 Spreading

All material shall be spread by hand.

PLI 13 Compaction

Small areas may be compacted by hand provided that the specified compaction is achieved.

PLI 16 Manufactured elements

Elements manufactured or designed by the Contractor, such as manhole rings and cover slabs, precast 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.

SCHEDULES OF QUANTITIES

Note: Labour-intensive works must be highlighted in the schedules/bills of quantities for the payment items relating to labour-intensive works.

The following wording, as appropriate, may be included in the preamble or pricing instructions to the schedules/bills of quantities in the Contract with the Contractor:

1 Those parts of the contract to be constructed using labour-intensive methods have been marked in the bill of quantities with the letters LI in a separate column or as a prefix or suffix against every item so designated. The works, or parts of the works so designated are to be constructed using labour-intensive methods only. The use of plant to provide such works, other than plant specifically provided for in the scope of works, is a deviation from the contract. The items marked with the letters 'LI' are not necessarily an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any of the requirements in the generic labour intensive specification in the Scope of Works.

2 Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment.

The following payment items should be included in the bill of quantities:

- Training allowance paid to targeted labour in terms of formal training
- Extra over for the administration of payment of training allowances to targeted labour
- Transport and accommodation of workers for training where it is not possible to undertake the training in close proximity to the site (Provisional sum)

PCBS CONSTRUCTION WORKS FOR COMMUNITY BASED SUB-CONTRACTORS

PCBS 1 SCOPE

The works covered in this section are works that have been proposed to be executed by Community Based Sub-Contractors. The identified scope of work by the Employer includes but not limited to the following:

- Excavation and backfilling of trenches for bulk water pipeline;
- Installation of Pipe Markers;
- Installation of Gabions;
- Installation of erf connections;
- Construction of Stone pitching (on areas identified by the Employer's Agent);
- Any other task identified on site and approved by the Employer's Agent on site;

PCBS 2 REQUIREMENTS

PCBS 2.1 Procurement

The Contractor shall handle and manage the procurement process of the sub-Contractors and once appointed, should be dealt with in accordance with the provisions of Clause 4.4 of the General Conditions of Contract 2015. The procurement process for the Community Based Sub-Contractors shall entail advertising, evaluation and selection of successful bidders.

PCBS 2.2 Training

Training for the successful Community Based Sub-Contractors must be conducted before commencement of any works on site.

PCBS 2.3 Management of Community Based Sub-Contractors

The Contractor shall be responsible for management of the Community based Sub Contractors including all works executed (including Quality, Contractual Liabilities).

The Contractor shall be expected to enter into a Contract with the nominated or selected Sub-Contractor(s) in accordance with the requirements of Clause 4.4 the General Conditions of Contract. The Employer must be supplied with a copy of the Contract /agreement for records.

In the execution of the Sub-Contract Work, the Contractor shall ensure that the Sub-Contractor(s) comply with all relevant legislation and regulations including, but not confined to, the Occupational Health and Safety Act. The Contractor hereby indemnifies the Employer against any loss, damage, or claim for Sub-Contract Works set out for this specific project arising out of the former's failure to comply with instructions issued to him in regard to these requirements.

PCBS 2.4 Overheads, charges and profit for payment associated with Community Based Sub-Contractor's works.

The Contractor shall charge a percentage for handling works associated with works executed by Community Based Sub-Contractors.

PCBS 3 MEASUREMENT AND PAYMENT

Measurement and payment for works implemented by Community Based Sub-Contractors will not be made separately, and would be regarded as being provided for in full by relevant payment items under applicable standrads.

PCBS 3.1 Procurement Of Community Based Sub-Contractors

Procurement process for the totality of all tenders amounting to 30% of section 2 and section 3 bid price community based sub-contractors to be concluded for the appointment of (minimum CIDB grading 1CE)……...Unit: Lump Sum

PCBS 3.2 Training of Community Based Sub-Contractors

b) Generic Skills……..Unit: Prov Sum
c) Entrepreneurial skills…… ……Unit: Prov Sum
d) Engineering skills…….. Unit: Prov Sum
e) Overheads, charges and profit on items 4.3 a,b,c, and d……... Unit: %

PCBS 3.3 Management Of Community Based Sub-Contractors

Superintendence of sub-contracted works i.e supervising, checking,approving and taking over works completed by community basedsub-contractors ……Unit: Months

PCBS 3.4 Construction works for Community Based Sub-Contractors

Overheads, charges and on payments associated with works amounting to 30% of Section 2 and section 3 bid price with scope of recommended to be carried out by community based subcontractors……..….Unit: %

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

C 3.7 HEALTH AND SAFETY SPECIFICATIONS

C3.7.1 HEALTH AND SAFETY REQUIREMENTS AND PROCEDURES

(a) Construction Regulations, 2003

The Contractor shall be required to comply with the Occupational Health and Safety Act, 1993: Construction Regulations, 2003 (the regulations) as promulgated in Government Gazette No 25207 and Regulation Gazette No 7721 of 18 July 2003. (A copy of the Construction Regulations is included as an Annexure in this Volume). 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, Bill of Quantities and Drawings, as well as in the Employers' health and safety specifications (regulation 4(1)) of the Construction Regulations 2003, which are included in this section.

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 above-mentioned plan or regulations.

A payment item is/Payment items are included in the Schedule of Quantities to cover the Contractor's cost for compliance with the OHS Act and the above-mentioned regulations.

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1. INTRODUCTION AND BACKGROUND

1.1. Background to the Health and Safety Specifications

The Construction Regulations (February 2014) places the onus on Sekhukhune District Municipality to prepare coherent health & safety specifications, highlighting risks not successfully eliminated during design. The Sekhukhune District Municipality also has the opportunity to set the tone and standard of occupational health & safety on the construction site.

1.2. Responsibility and Accountability

It is imperative to understand the process of determining legal accountability, as the OHS-Act is the only criminal Act still administered by the Department of Labour. It *assumes* that the CEO is overall accountable even though he may delegate some of his responsibilities. This principal is entrenched in Section 37(1) of the Act. This is generally referred to as the REASONABLE MAN TEST. SECTION 37: Acts or omissions by employees or Mandataries

1.3. Purpose of the Health and Safety Specifications

The purpose of this specification document is to provide the relevant Principal Contractor (and sub-contractor) with any information other than the standard conditions pertaining to construction sites which might affect the health and safetyof persons at work and of persons in connection with the use of plant and machinery during Construction work.

1.4. Implementation of the Health and Safety Specifications

To brief the Principle and Sub Contractor on the significant health and safety requirements and aspects of the project. This shall include the provision of thefollowing information and requirements namely:

- safety considerations affecting the site of the project and its environment;
- health and safety aspects of the associated structures and equipment;
- required submissions on health and safety matters from the Principal Contractor (and Sub Contractor);
- the Principal Contractor's (Sub - Contractors) health and safety plan.

To serve to ensure that the Principal Contractor (and Sub Contractors) is fully aware of what is expected from them with regards to the Occupational Health and Safety Act, 85 of 1993 and the Regulations made there-under including the applicable safety standards, and in particular in terms of Section 8 and 44 of the Act.

To inform the Principal Contractor that the Occupational Health and Safety Act, 85 of 1993 in its entirety shall apply to the contract to which this specification document applies. The Construction Regulations promulgated on 7 February 2014 and incorporated into the above Act by Government Notice R 84, published in Government Gazette 37305 shall specifically apply to all persons involved in the construction work pertaining to this project.

"Purpose of the Act" –To provide for the health and safety of persons at work and the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.

"Agent" –means a competent person who acts as a representative for a Sekhukhune District Municipality;

"Sekhukhune District Municipality" –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;

"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 6
b) The construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or bulk water pipeline 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- Prepares a design; Checks and approves a design;
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 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;

"Health and Safety File" –means a file, or other record containing the information by the Construction Regulations;

"Health and Safety Plan" –means a site, activity or project specific documented plan in accordance with the Sekhukhune District Municipality 's health and safety specifications;

"Health and Safety Specification" –means a site, activity or project specific document prepared by the Sekhukhune District Municipality 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 Sekhukhune District Municipality 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.

1.5. Abbreviations:

- GMR: General Machinery Regulations

- OHS Act: Occupational Health & Safety Act. Act 85 of 1993
  Constr Reg: Construction Regulation 2014
- ORHVS: Operating Regulations for High Voltage Systems
  PPE: Personal Protective Equipment

2. OCCUPATIONAL HEALTH & SAFETY MANAGEMENT

2.1 ROLES

Sekhukhune District Municipality / Agent

a) Prepare a baseline risk assessment and issue a health and safety specification to the Principal Contractor, Designer and include the specification in tender documentation.
b) The Sekhukhune District Municipality or the appointed Sekhukhune District Municipality Agent 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 ConstructionRegulations.
c)The Sekhukhune District Municipality or the appointed Sekhukhune District Municipality Agent shall discuss, negotiate and approve the contents of the specified project health and safety plan submitted by the Principal and Sub Contractor.
d) The Sekhukhune District Municipality or his Agent will take reasonable steps to ensure that the health and safety plan of the Principle and Sub Contractor is correctly implemented and maintained. Monthly audits shall be conducted to monitor the compliance.
e) In the event of design changes the Sekhukhune District Municipality or the appointed Agent on his behalf will ensure that enough resources will be provided to implement the work safely.
f) The Sekhukhune District Municipality 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;*
- *have acted 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.*

Designer

- Must take into account the health and safety specifications of the Sekhukhune District Municipality.
- Before the tender process, the designer must make available a report to the Sekhukhune District Municipality about:

  - All the relevant health and safety information about the design of the relevantstructure that might affect the pricing of the construction work.
  - The geotechnical –science aspects, where appropriate.
  - The loading that the structure is design to withstand.

- Inform the Sekhukhune District Municipality in writing of any known or anticipated dangers or hazards related to the project.
- Make available all relevant information required for the safe execution of the work upon being designed or when the design is subsequently altered.
- During the design take into account the hazards relating to any subsequent maintenance to be performed with the minimum risk.
- During the design stage cognizance of ergonomic design principals must be applied in order to minimize ergonomic related hazards in all phases of the life cycle of a structure.

2.2 Implementation of the Health and Safety Specifications (Drafting of the coherentHealth & Safety Plan)

These health & safety specifications document forms an integral part of the contract, and the Principal Contractor is expected to use it when compiling its project-specific coherent health & safety plan. The Principal Contractor must forward a copy of these specifications to all Contractors at their bidding stage so that they can in turn preparecoherent health & safety plans relating to their operations.

3. OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM ELEMENTS

3.1 Scope of the Project

These Specifications set out the requirements for eliminating or if this is not possible, for minimising as far as reasonably practicable, the risk of incidents and injuries occurring at Sekhukhune District Municipality. This document covers work to be undertakenof the project and sets out the rules and procedures for engagement on the project. The scope also addresses legal compliance, Sekhukhune District Municipality standards, hazard identification and risk assessment, risk control, and the promotion of a health and safety culture amongst those working on the project. The health &
safety specifications also make provision for the protection of those persons other than employees.

3.2 The Extent of the works:

- Establishment of Contractor's camp site.
- The excavation of the trenches and installation of the pipes will be done conventionally due to the depth of trenches.
- Installation of reticulation Networks in Maepa and Ratau.

3.3 Interpretations

3.3.1Application

This specifications document is a legal compliance document compiled in terms of the OHS Act & Construction Regulations 2014 and is therefore binding. The document must be read in conjunction with other relevant legislation.

3.3.2Definitions

The definitions as listed in the OHS Act 85/1993 and Construction Regulations (February 2014) shall apply.

3.4 Minimum Administrative Requirements

3.4.1 Notification of Intention to Commence Construction Work

The Principal Contractor must notify the Provincial Director of the Department of Labour in writing before construction work commences. A copy of this notification must be held in the Principal Contractor's health & safety file on site. The fax transmission slip will serve as proof of notification.

See attached Annexure "F"

3.4.2 Assignment of the Principal Contractor's / Contractors' Responsible Persons to Supervise and Co-ordinate Health and Safety on Site

The Principal Contractor and all Contractors must make supervisory appointments as well as other relevant appointments in writing (as stipulated by the OHS Act and Construction Regulations 2014). See attached Annexure 'B' for more detail on what health & safety management appointments are relevant on this project.

3.4.3 Competence of the Principal Contractor's / Contractors' Appointed Competent Persons

The Principal Contractor and Contractors' competent persons for the various risk management portfolios must fulfil the criteria as stipulated in terms of the definition 'Competent' in accordance with the Construction Regulations (February2014).

3.4.4 Compensation for Occupational Injuries and Diseases Act 130 of 1993(COIDA)

The Principal Contractor must have in its possession a letter of good standing issued by its Compensation Assuror as proof of registration.

Contractors must also hold proof of workman's compensation assurance registration in the form of a letter of good standing and forward a copy to the Principal Contractor before they begin work on site. Contractors must be in good standing at all times while carrying out work on site.

3.4.5 Health and Safety Organogram

Including all appointed risk management competent persons. In cases where appointments have not yet been made, the organogram shall reflect the intended positions.
The organogram must be updated when there are changes in the Site Management Structure, and dated accordingly. The organogram merely serves as a quick reference to who is responsible for what risk portfolio in what area.

3.4.6 Preliminary Hazard Identification and Risk Assessments, Progress Hazard Identification and Risk Assessments Reviews.

The Principal Contractor must cause preliminary hazard identification and risk assessment to be performed under the leadership of a competent person before commencement of construction work. On this project detailed task- specific risk assessments based on the proposed sequence of work (method of work) must be compiled. Generic risk assessments will not be accepted.

The assessed risks, together with written safe work procedures for the 'medium & high-risk' rated activities must form part of the coherent site specific health and safety plan submitted for approval by House of Safety. The risk assessments must include:

a) A list of hazards identified as well as potentially hazardous tasks;

b) The risks which may result based on the list of hazards and tasks;
c) A set of safe work procedures to be implemented with the aim of eliminating or if this is not possible, reducing and/or controlling the risks as far as reasonably practicable to ALARP (as low as reasonably practicable);
d) A monitoring and review procedure of the risk assessments as they change i.e. how will the risk assessments be reviewed, when will they be reviewed and by whom.

The Principal Contractor must ensure that all Contractors inform, instruct and train their workers regarding any hazards, the associated risks and the related safe work procedures to be implemented before any work commences and thereafter at regular intervals as the risks change and as new risks develop. This training should be carried out in the form of toolbox health & safety talks. Contractors must conduct their own toolbox talks and submit proof of these talks in the form of attendance registers to the Principal Contractor at least every two weeks. Every worker on site must undergo such toolbox safety talks with the attendance registers kept in the Principal Contractor's safety file.

Contractors must conduct their own hazard identifications and risk assessments specific to their operations and forward a copy to the Principal Contractor.

The Principal Contractor when required must report on the status of these Contractor risk assessments to the Sekhukhune District Municipality i.e. at audits.

3.4.7 General Record Keeping

The Principal Contractor and all Contractors must keep and maintain all the necessary Health and Safety records to demonstrate compliance with these Coherent Specifications, the OHS Act 85/1993, and the Construction Regulations (February 2014). The Principal Contractor must also ensure that all records of incidents/injuries, emergency procedures, training, planned maintenance inspections, monthly contractor audits, etc. are kept in the health & safety file(s) held in the site office. The Principal Contractor must ensure that every Contractor keeps its own health & safety file, maintains the file and makes it available on request (the file must include the Contractor's health & safety plan and all relevant records). Such 'Contractor safety files' must be audited by the Principal Contractor on a monthly basis with audit reports kept as proof.

3.4.8 Injury / Incident Reporting and Investigation

Injuries are to be categorised into first aid; medical; disabling (lost day); and fatal. When reporting injuries to the Sekhukhune District Municipality, these categories must be used. The Principal Contractor must investigate all injuries. All Contractors must report injuries to the Principal Contractor immediately and the Principal Contractor must inform the Sekhukhune District Municipality immediately. All incidents reportable in terms of the provisions of Section 24 of the OHS Act must be reported to the local Dept. of Labour in the prescribed manner.

3.4.9 Consolidation of Health & Safety Documentation

It is the duty of the Principal Contractor to ensure that all documentation required to be kept or generated during the construction phase is consolidated into one set of documents that must be handed over to the Sekhukhune District Municipality upon completion of the construction work. This consolidated safety file(s) should include instructions from the design team that will be required for the continued safe operation and maintenance of the new structure(s).

3.4.10 Offences and Penalties

Penalties may be imposed on the Principal Contractor and Contractors for ongoing non-compliance with the provisions of the Sekhukhune District Municipality 's coherent health & safety specifications, the Principal Contractor's coherent health & safety plan, site health & safety procedures and rules. Non-compliances identified during safety agent audits and visits will be categorised into one of three levels based on severity. These will be as follows: Life threatening situation - a prohibition order will be issued by means of a written instruction in the site instruction book or an explanation in an audit report. This activity must be seized immediately and corrective measures taken. Serious injury possible – a contravention notice will be issued with a time frame for compliance stipulated. Minor or no injury may result – an improvement notice will be issued. The corrective measures stipulated in the audit report must be taken. The methodology used to decide the above levels will be directly linked to the risk assessments of the Principal Contractor and contractors, Sekhukhune DistrictMunicipality Standards. The decision of the safety Agent will be final.

3.5 Principal Contractors, Contractors and Sub-contractors

3.5.1 Principal Contractor's and Contractors' Requirements

The Principal Contractor must ensure that all Contractors appointed by them comply with these Specifications, the Principal coherent health & safety plan aswell as the OHS Act, Construction Regulations (February 2014), and other relevant legislation that may relate to the activities directly or indirectly. A Contractor, when appointing other Contractors as 'Sub-contractors', shall mutatis mutandis ensure compliance as if it was the Principal Contractor.

The Principal Contractor may only allow a Contractor to begin work on site after receiving a coherent health & safety plan which must include a project specific hazard identification, risk assessments and safety measures. The Principal Contractor must test competency and finally approve his sub – contractor coherent site specific health and safety plan. The Principal Contractor must audit each of its contractors on a monthly basis, with audit reports kept in the health & safety file on site. The audit must include an administrative assessment as well as a physical inspection of the contractor's site activities.

The Principal Contractor must stop any Contractor from carrying out construction work that is not in accordance with the Principal Contractor's and/or Contractor's health & safety plan or if there is an immediate threat to thehealth and safety of persons.

The Principal Contractor shall take all reasonable steps necessary to ensure co-operation between all contractors to enable each of those contractors to comply with the provisions of the Construction Regulations;

The Principal Contractor shall take all reasonable steps to ensure that each contractor's coherent health and safety plan is implemented and maintained on the construction site: Provided that the steps taken shall include periodic audits at intervals mutually agreed upon between the Principal Contractor and contractors, but at least once every month;

The Principal Contractor must ensure that where changes are brought about to the design and construction, that sufficient health and safety information and appropriate resources are made available to contractors so as to allow them to execute the work safely;

The Principal Contractor must ensure that every contractor is registered and in good standing with a recognised compensation fund or with a licensed compensation insurer prior to work commencing on site;

The Principal Contractor must ensure that potential contractors submitting tenders have made provision for the cost of health and safety measures during the construction process;

The Principal Contractor shall discuss and negotiate with the contractor the contents of the coherent health and safety plan and shall finally approve that plan for implementation;

The Principal Contractor shall hand over a consolidated health and safety file to the Sekhukhune District Municipality upon completion of the construction work and shall include a record of all drawings, designs, materials used and other similar information concerning the completed structure;

The Principal Contractor may only appoint a contractor to perform construction work when such Principal Contractor is reasonably satisfied that the contractor he or she intends to appoint, has the necessary competencies and resources to perform the construction work safely and that the contractor is an approved Sekhukhune District Municipality contractor.

3.5.2 Principal Contractor / Contractor Competency Assessment

The Principal Contractor must be reasonably satisfied that the contractors it intends to appoint have the necessary competencies and resources to safely conduct the work they will be appointed for. This should be established at tender stage and before appointments are made. One of the preferred ways of determining whether a contractor is competent is to make sure the contractor isan accredited contractor for Sekhukhune District Municipality. Once the contractor is appointed, but before it begins work on site a site- specific safety plan must be discussed and negotiated with the Principal Contractor. Such safety plan must be approved for implementation by the Principal Contractor.

The Principal Contractor and Contractors should submit the following documentation for perusal and verification by the Sekhukhune District Municipalityand Principal Contractor respectively:

- Coherent health & safety plan as compiled for this project; (including Risk assessments, safe work procedures, fall protection plan, PTW Issuer/PTWHolder certificates
- Management Structure as envisaged at tender (organogram);
- Letter of Good Standing with the Compensation Commissioner or FEM;
- Proof of health & safety training and other related training; (CV andcertificates) Legislative appointment letters
- Notification of Construction work; (proof notification was done)

3.5.3 Pricing for Occupational Health & Safety Compliance All parties bidding to do work on this construction project must ensure that they have made provision for the cost of complying with this Specifications document as well as with the OHS Act and incorporated Regulations as a minimum requirement in their tender documentation. It must also be taken into consideration that time is money, which implies that sufficient time must be allowed for the implementation of the minimum OHS standards. No additional claims will be entertained at a later stage should a compliance requirement be prescribed in the OHS Act, incorporated regulations or in this Specifications document.

3.5.4 Contractors' Coherent Health & Safety Plans [Construction Regulations 2014]

1. Introduction:

The Construction Regulations (2014) aims to improve overall management and co-ordination of Health, Safety and Welfare throughout the Construction Phase and reduce the large number of serious and fatal injuries and cases of ill health, which occur every year in the Construction Industry.
In terms of the Construction Regulations (2014), the Principal Contractor is required to develop a Health and Safety Plan before work commences on site and review it throughout the

Construction Phase. The degree of detail required in the Health and Safety Plan and the time and effort in preparing it should be in proportion to the nature, size and level of Health and Safety risks involved in the project. Projects involving minimal risks will call for simple, straightforward plans. Large projects or those involving significant risks such as this project will need much more detail.

3.5.4 What should the construction health & safety plan cover?

The Construction Health and Safety Plan should set out the arrangementsfor ensuring the Health and Safety of everyone carrying out the construction work as well as all other persons who may be affected by it. The index of this plan must be in line with Annexure:

3.5.5 Communication and Management of the work

The Principal Contractor must indicate in its health and safety managementplan that it has made provision for the following:

a. Management structure and responsibilities
b. Health and Safety goals for the project and arrangements for monitoring and review of Health and Safety performance i.e. safety meetings; contractor meetings; risk assessment review, etc
c. Arrangement for:

   i. Regular liaison between parties on site i.e. meetings
   ii. Consultation with the work force i.e. toolbox talks
   iii. The exchange of design information between the Sekhukhune DistrictMunicipality, designers, and Contractors on site
   iv. Selection and control of Contractors i.e. selection criteria; inspections;audits, etc.
   v. Site health & safety induction and onsite training i.e. toolbox talks
   vi. Welfare facilities, first aid, emergency planning and fire prevention strategy
   vii. The reporting and investigation of injuries and incidents including nearmisses what the intended system will be
   viii. The production, approval and review of risk assessments, safe work procedures and method statements and how does the company's riskassessment system work.

d. Site specific rules and procedures.

3.6 Sekhukhune District Municipality identified Hazards and Potentially Hazardous Situations

1. Existing services
2. Interface with the public
3. Hazardous chemical such as solvents, cleaning agents, cement, fuels, oils,epoxies, etc.
4. Site security and access control issues
5. Relocation and protection of existing services
6. Finishing trades

3.6.1 Unforeseeable Hazards

The Principal Contractor must immediately notify Contractors as well as the Sekhukhune District Municipality, in writing, of any hazardous or potentially hazardoussituations that may arise during the performance of construction activities so that the necessary precautions may be taken before such work begins.

3.7 Site Operational Requirements

3.7.1 Health and Safety Representative(s)

The Principal Contractor and all Contractors must ensure that Health and Safety Representative(s) are appointed under consultation with the employees. The H&S representatives must be competent to carry out their functions. The appointments must be in writing. The Health and Safety Representatives should carry out monthly inspections, keep records of the inspections and report all findings to the Responsible Person or safety officer forthwith and at monthly health & safety committee meetings. At least one Health & safety representatives is required by all Employers on site.

3.7.2. Health and Safety Committees

The Principal Contractor must ensure that project health and safety committee meetings are held monthly with minutes kept. Meetings must be chaired by the Principal Contractor's Responsible Person [CR 7(1) person]. All Contractors' Responsible Persons and Health & Safety Representatives must attend the Principal Contractor's monthly health & safety meetings. The Principal Contractor's appointed supervisors must also attend health & safety meetings. The following topics must be tabled at meetings: management appointments and risk management portfolios; sub-contractor legal compliance issues; injuries and incidents; hazards and risk assessments (present and foreseen); safety procedures; method statements for upcoming activities; planned inspections and registers/record keeping, etc. The committee chairperson must sign off and date the minutes.

3.7.3 Health and Safety Training

3.7.3.1 Induction

The Principal Contractor must ensure that all site personnel including allsub-contractors undergo the agreed health & safety induction training session held and managed by the P/Contractor before any worker startswork on the project. A record of attendance must be kept in the health & safety file. Workers must carry proof of inductions on their person while on site i.e. identification passport cards or similar to be agreed.

3.7.3.2 Awareness

The Principal Contractor must ensure that, on site, periodic toolbox health & safety talks take place at least once every two weeks. All site personnel including all sub-contractors must attend safety talks at such intervals and keep proof thereof. These talks should deal with risks relevant to the construction work at hand i.e. they should be based on the job-specific risk assessments and safe work procedures. Records of attendance must be kept in the P/contractor's health & safety file. All contractors' employees must attend safety awareness toolbox talks carried out by their supervisors, the attendance registers must be copied to the Principal Contractor together with information on the information discussed at the session.

3.7.3.3 Competence

All competent persons must have the knowledge, experience, training, and qualifications specific to the work they have been appointed to supervise, control and/or carry out. This must be assessed on a regular basis e.g. training, evaluation, and periodic audits by the Sekhukhune District Municipality, progress meetings, etc. The Principal Contractor is responsible to ensure that Competent Contractors are appointed to carry out construction work on site.

3.7.4 Health & Safety Audits, Monitoring and Reporting

The Principal Contractor is obligated to conduct monthly audits on all Contractors appointed by it and keep audit reports in its health & safety file. Contractors have to audit their sub-contractors and keep records of these audits in *their* health & safety files, made available on request. The Sekhukhune DistrictMunicipality /Agent will conduct monthly audits on the Principal Contractors' safety management plan.

3.7.5 Emergency Procedures

The procedure must detail the response procedures including the following keyelements:

- List of key competent personnel;
- Details of emergency services;
- Actions or steps to be taken in the event of the specific types ofemergencies;
- Evacuation procedures: including routes and exits to be available on adrawing.
- Emergency procedure(s) must include, but shall not be limited to: fire; spills; injury to employees; damage to material / equipment / plant; use of hazardous substances; bomb threats; major incidents/injuries; evacuation; etc.
- The Principal Contractor must advise the Sekhukhune District Municipality in writing forthwith, of any emergency situations, together with a record ofaction taken/action to be taken.
- A contact list of all service providers (Fire Department, Ambulance, Police, Medical and Hospital, etc.) must be maintained and made available to site personnel.
- The emergency plan will need to be reviewed from time to time asconditions/environment changes i.e. as building work increases inextent.

3.7.6 First Aid Boxes and First Aid Equipment

The Principal Contractor and all Contractors must appoint First Aider(s) in writing. The Principal Contractor must appoint at least one First Aider to start with, which first aider must be certificated. Copies of valid certificates are to be kept on site. The Principal Contractor must provide at least 1 (one) first aid box, adequately stocked at all times. Due to the nature of this project i.e. satellite work stations/areas, further first aid boxes must be provided close to the various work stations to allow for quick, effective treatment of injured persons. As the work progresses and the structure increases in height, extra first aid

3.7.7 Personal Protective Equipment (PPE) and Clothing

The Contractor must ensure that all site workers are issued with and wear theappropriate PPE as indicated in their risk assessments. The Contractors mustmake provision and keep adequate quantities of SANS approved PPE on siteat all times according to their risk assessments. Safety harnesses are mandatory wherever work takes place in an elevated area where safe working platforms or ladders are not possible. Overalls clearly indicating the Contractor's logo must be worn and all sub-contractors must conform to this requirement. Eye protection must be worn by those working grinders, skill saws, and high pressure water cleaners. Even those workers in close proximity to these operations will also be required to wear such eye protection.

Safe footwear will be required by all workers. A high visibility vest is mandatory on a Sekhukhune District Municipality site.

3.7.8 Occupational Health and Safety (OHS) Signage

The Principal Contractor must provide adequate on-site OHS signage. Including but not limited to: 'construction work - no unauthorised entry', 'beware of overhead work', 'hard hat area', first aid – to be posted up at all work areas/zones.

Signage must also be posted up at strategic locations to warn the public of diversions, alternative through ways and other irregularities caused by construction work (pedestrians and motorists).

Signs are also required as per law e.g. scaffolding and other potential risk areas/operations such as exposed edges and openings and trenches/excavations where persons are at work. Safety signs and awareness posters will also be required in strategic locations on site such as frequently used access routes, stairways and entrances to structures and buildings where the workers will continuously be made aware of health & safety. Health & safety signage must be well maintained including weekly inspections, cleaning, replacement and repair.

3.7.9 Public and Site Visitor Health & Safety

Public walkways and roadways must be kept clean and free of construction materials so as to prevent any negative impact on the public. Public roadways and walkways will have to be cleaned on a regular basis – daily inspections to be conducted by the Principal Contractor with action to be taken without delay(daily).

Site visitors must be briefed on the hazards they may be exposed to as well as what measures are in place or should be taken to control these hazards. The Construction Regulations require that a record of these 'inductions' be kept on site. It is advised that a visitor book with site rules leaflet be kept at the reception/site office and all visitors to be directed to such point where they must read through the site safety information and sign the visitor book. It will be the Principal Contractor's prerogative to decide whether site visitors require supervision while on site. Visitor hard hats must be kept in the site office.

3.7.10 Access to Site

Where any permits are necessary from the local authorities, this will be the Principal Contractor's responsibility. The road surface of all public and private roadways and pavements/pedestrian walkways must remain in a reasonably clean state, free of excessive sand, stone, water or other construction related materials. The access gate(s) must be controlled and visitors must sign in andreport to the site office for further instruction.

3.7.11 Night Work (After Hours)

No night work will be allowed within the hazardous zone on this project without prior approval from the Sekhukhune District Municipality /Sekhukhune District Municipality 's Agent and the Construction Health and Safety Agent. Additional health and safety requirements will then be applicable.

3.7.12 Transport of Workers

The Principal Contractor and other Contractors may not transport:
Persons together with goods or tools unless there is an appropriate area or section to store the tools or equipment; Contractors must adhere to the NationalRoad Traffic Act.

3.7.13 Construction Health & Safety Officer

A *full-time* construction safety officer (in terms of Construction Regulation 8) will be required on this project. The construction health and safety officer must be registered with SACPCMP. The construction officer will be required to carry out at least the following duties:

a) Health & safety audits and inspections on site including administrative and Physical audits of all Contractors' health & safety plans, files and activities, and record findings in the form of audit reports to be kept in the health & safety file; b) Assess, and finally approve contractor safety plans;

3.8 Physical Requirements

3.8.1 Earthworks (including Trenching and excavations)

The Principal Contractor and relevant Contractors must make provision in their tender for the shoring of excavations where the soil conditions warrant it or if this is not possible cut it back - excavation walls must be battered back to a safe angle, termed the safe angle of repose.

The Principal Contractor has the following options: first option is to shore or brace the excavation, should this not be practical then such excavation must be battered back to the safe angle of repose (second option). Should the first two options not be deemed necessary by the Contractor, then permission must be given in writing by the appointed competent excavation supervisor (third option). Where uncertainty pertaining to the stability of the soil exists, the decision of a professional engineer or professional technologist competent in excavations shall be decisive. Such permission must be in writing.

The following is relevant to excavations:

- Excavations/trenches are inspected before every shift and a record of these inspections is kept;
- Safe work procedures have been communicated to the workers;
- The safe work procedures are enforced and maintained by the Principal Contractor's and Contractors' responsible persons at all times;
- Excavations next to permanent or temporary roadways - 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 provision 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, steps are taken that may be necessary to ensure the stability of such building, structure or road as well as the safety of persons
- Cause convenient and safe means of access to be provided into 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. The necessary steps must then be taken to render the circumstances safe for all persons involved;
- Cause every excavation which is accessible to the public or which is adjacent to public roads or thoroughfares, or where the safety of persons may be endangered, to be
- Adequately protected by a barrier or fence of at least one meter 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;
- Cause warning signs to be positioned next to an excavation within which persons are working or carrying out inspections or tests

3.8.2 Deliveries, Waste Removal, Stacking/Storage of Materials

The Principal Contractor and other relevant contractors must ensure that there is an appointed stacking supervisor and all materials, formwork and all equipment is stacked and stored safely, on level, compact ground, out of access ways and no more than three times the minimum base width in height. Pallets of bricks may not be stacked more than two above each other and must be on timber pallets. No construction materials or equipment may be stacked orstored in public areas unless authorised by the Sekhukhune District Municipality and fenced off as per the Sekhukhune District Municipality's requirements. Waste materials must be kept within designated construction zones. The Principal Contractor will be responsible for co-ordinating and managing this function.

3.8.3 Fire Extinguishers and Fire Fighting Equipment

The Principal Contractor and relevant Contractors shall provide adequate, regularly serviced fire fighting 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. A minimum of four 9 kg dry chemical powder fire extinguishers must be available in and around the site office establishment and stores. Fire extinguishers must also be placed at all work zones/areas, in strategic locations. Wherever *'hot work' is taking place, additional fire extinguishers must be on hand. Contractors are responsible for ensuring compliance with hot work procedures and must be in possession of method statements detailing the safe working procedures. *'Hot work' includes all work that generates a spark or flame and may therefore result in a fire.

Further, during the finishing stages of the construction phase when the finishing trades are on site, fire extinguishers will be required at strategic locations within the work areas – to be supplied and managed by the Principal Contractor.

3.9 Plant, Machinery and Equipment

3.9.1 Construction Vehicles & Mobile Plant

"Construction Plant" includes all types of plant including but not limited to, cranes, piling rigs, excavators, construction vehicles, compaction plant, batch plants and lifting equipment.

The Principal Contractor must ensure that such plant complies with the requirements of the OHS Act, Construction Regulations (Feb 2014) and any manufacturers specifications. The Principal Contractor and all relevant contractors must inspect and keep records of inspections on construction vehicles and mobile plant used on site. Only authorised/competent persons in the possession of the necessary training certificates and in possession of a certificate of medical fitness may operate construction vehicles and mobile plant.

Appropriate PPE and clothing must be provided and maintained in good condition at all times.
Reverse alarms must be installed on construction vehicles i.e. trucks, digger loaders, etc.
Vehicles and pedestrian traffic must be safely separated, preventing any unnecessary interfacing.
Any vehicle or mobile plant using any public road must be roadworthy and carry a certificate proving this. Likewise any operator of such construction vehicle or mobile plant will have to carry the necessary driver's license.

3.9.2 Pressure Equipment

The Principal Contractor and all relevant Contractors must comply with thePressure Equipment Regulations, including:

- Providing competency and awareness training to the operators/users; Providing the relevant PPE and clothing;
- Inspecting equipment regularly (every 3 months) and keeping records of theseinspections;
- Providing appropriate fire fighting equipment (Fire Extinguishers) on hand;
- Ensuring that oxygen and acetylene bottles are secured in an upright position,do not show signs of corrosion or damage and have flash back arrestors fitted on both torch & bottle ends of hoses.

3.9.3 Hired Plant and Machinery

The Principal Contractor must ensure that any hired plant and machinery usedon site is safe for use and complies with the minimum legislated requirements. The necessary requirements as stipulated by the OHS Act and Construction Regulations shall apply. The Principal Contractor shall ensure that operators hired with machinery are competent and that competency and medical certificates are kept on site in the health & safety file. Any load test requirements and inspections in terms of legislation must be complied with andcopies of load test certificates and inspections must be kept in the health & safety file. All relevant contractors

3.9.4 General Machinery

The Principal Contractor and relevant contractors must ensure compliance with the Driven Machinery Regulations, which includes carrying out risk assessments on the machines, inspecting machinery regularly, appointing a competent person to inspect and ensure maintenance, issuing PPE and relevant clothing, and training those who use machinery.

3.9.5 Electrical Installations and Portable Electrical Tools

The Sekhukhune District Municipality will ensure as far as possible that the Principal Contractor is made aware of the positions of all electrical power lines. The Principal Contractor must notify the Sekhukhune District Municipality should it not be sure of the location of any electrical power lines.
The Principal Contractor must comply with the Electrical Installation Regulations, the Electrical Machinery Regulations and the Construction Regulations (CR 24).

The Principal Contractor must keep a copy of the Certificate of Compliance (CoC) for its temporary electrical power supply. A revised CoC is required whenever the installation is altered or changed in any way. All temporary electrical installations must be inspected at least weekly by a competent person appointed in writing with records kept. Portable electrical tools and equipment must be visually inspected daily with records kept. It is advised that the P/Contractor appoints the electrical contractor to inspect the temporary electrical installation on a weekly basis with feedback given in a report so that any maintenance and repairs can be undertaken. Such appointed inspector must ‘stop’ or isolate any distribution board that is unsafe for use.

3.10 Occupational Health

3.10.1 Industrial Hygiene (exposure to physical and chemical stress factors)

Exposure of workers to occupational health hazards and risks is very common in any work environment, especially in construction. Occupational exposure is a major problem and all Contractors must ensure that proper health and hygiene measures are put in place to prevent exposure to these hazards. Prevent inhalation, ingestion, and adsorption through the skin of hazardous chemical substances.

3.10.1.1 Noise induced hearing loss is a highly underrated occupational condition. Occupational noise emitted by construction machinery and power tools must be controlled as far as possible by implementing engineering solutions such as noise dampening, regular maintenance, servicing and inspection, screening off the noise, and reducing the number of persons exposed. Personal protective equipment such as earmuffs and earplugs must also be used in conjunction with engineering controls so as to reduce noise exposure to below the acceptable levels.

3.10.1.2 Ergonomics is the study of how workers relate to their workstations. We advise the Principal Contractor and Contractors to take this into consideration when conducting risk assessments, thereby improvingthe worker-task relationship, which will in turn improve productivity and reduce chronic conditions such as back strains, joint problems and mental fatigue, amongst others.

3.10.2 Hazardous Chemical Substances (HCS)

The Principal Contractor and other relevant contractors must provide the necessary training and information as far as the use, transport, and storage of HCS. The Principal Contractor must ensure that the use, transport, and storage of HCS are carried out as prescribed in the HCS Regulations.

The Principal Contractor and contractors must ensure that all hazardous chemicals on site have Material Safety Data Sheets (MSDS) 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 MSDS's and how to treat HCS incidents appropriately. Copies of the MSDS's must be kept in the first aid box and in the store. All containers must be clearly labelled.

Flammable substances must be stored separately, away from other materials, and in a well-ventilated area (appropriate cross ventilation). A competent person should be appointed to be in control of this portfolio.

Stores must be well ventilated, preventing the build-up of flammable and toxic gases/vapours. Should fuel storage containers be used, they must conform to the general environmental legislation and Environmental Management Plan (if a requirement on this site). The necessary safety signage must to be posted up – 'no naked flames', 'no smoking'. Two 9 kg DCP fire extinguishers must be placed near to the fuel containers, but not within 5 m of the containers. These extinguishers are over and above the minimum four required for the offices and stores.

3.10.3 Welfare Facilities

The Principal Contractor must supply sufficient toilets (1 toilet per 30 workers), clean, lockable changing facilities, hand washing facilities, soap, toilet paper, and hand drying material. Waste bins must be strategically placed around site and emptied regularly. Workers must not be exposed to hazardous materials/substances while eating and must be provided with adequate,

sheltered eating areas complete with benches and tables. Stores may not double up a change rooms or mess areas.

3.10.4 Alcohol and other Drugs

No alcohol and/or other drugs will be allowed on site. No person may be under the influence of alcohol or any other drugs while on the construction site. Any person on prescription medication must inform his/her superior, who shall in turn report this to the Principal Contractor forthwith. Any person suffering from any illness/condition that may have a negative effect on his/her /anyone else's health or safety performance must report this to his/her superior, who shall in turn report this to the Principal Contractor forthwith. Any person suspected of being under the influence of alcohol or other drugs must be sent home immediately, to report back the next day for a preliminary inquiry. The Contractor concerned must follow a full disciplinary procedure and a copy of the disciplinary action must be forwarded to the Principal Contractor for its records.

3.10.5 COVID-19

Documents that need to be updated

Document control will be a critical path to ensure that all employees knows the exact risks and mitigation factors around the COVID 19 virus.

- Baseline risk assessment shall be written on COVID 19 to ensure all the risks is covered and discussed to the employees
- Health and safety policy would need to be changed to address the COVID 19 pandemic
- All safe work procedures shall cover COVID 19
- COVID 19 guideline or procedure shall be drawn up and available in the safety file and discussed to all employees. This procedure will explain how the contractor will ensure that the virus does not spread during construction.
- A guideline on what the process will be if an employee or a visitor is showing symptoms of the COVID 19 virus
- COVID 19 Toolbox talks shall be held with all employees to explain to the employees what the COVID 19 virus is
- Applicable Checklist & register should be in place to ensure that all the measures that is stipulated in the Client OHS Spec, Baseline Risk assessment, COVID procedure and contractor OHS Plan
- Sign in register will need to be available at every site entrance where the employee or site security can write down the temperature of the employee or Visitor
- All Health and safety related policies will need to be revised to ensure that COVID 19 is cover and explained in all of them in the applicable manner
- COVID 19 manager shall be appointed on site. This employee shall be on site full-time.

Hand sanitation points

Hand sanitation points will need to be placed at strategic places as well as the high risk area. The first place where sanitation station shall be placed is at all site entrances. High risk areas will be identified by the following:

- Areas where employees are in frequent and/or close contact (i.e. within 1,5 Meter of people)

The high risk areas will have additional sanitation stations, all employees shall wear mask or face shield when working closer than 1, 5 Meter from the nearest employee. Employees will be trained to wash hands more frequently or to use sanitizer more frequently.

The hand sanitizer that will be used shall have more than 70% of Ethyl alcohol. This needs to be ensured by the safety office on site as well as a Material Safety Data Sheet (MSDS) available close by for confirmation of the 70%. The hazardous chemical register shall be available in the flammable store. This register shall also include the hand sanitizer.

Hand washing posters shall be available at all hand washing stations to ensure that all employees know what the correct way is of washing your hands to cover all the areas. Informational posters about COVID 19 shall also be visible at these areas to ensure that employees know how the virus spreads and how to prevent spreading. The sanitisation stations will need to be cleaned on a regular basis.

Cleaning & disinfecting

All work surfaces need to be cleaned and disinfected on a regular basis. The chemical that will be used to clean the surfaces must have a minimum of 70% Ethyl Alcohol and the MSDS for that specific sanitizer must be available in the safety file under the MSDS's section. Plant, site offices & construction sites shall be decontaminated before the start of the site. The contractor that decontaminated the site shall issue a certificate to explain it has been done and explain what chemicals was used.

Offices

- All offices must have a biochemical hazardous bin with a medical waste bag that can be sealed
- The offices need to be cleaned on a regular bases
- If disposable gloves is being used they must be discarded in the medical waste bin.
- Only employees that is working in the office will be allowed in the offices
- All visitors must arrange with office personnel if they have an appointment with one of the office employees to move outside and have the appointment outside or in a well-ventilated area and if possible keep social distancing distance (1,5 Meter)
- Cleaners must focus on cleaning the following areas: desks, printers, door handles, kettles, microwaves & office equipment (cabinets, staplers, punchers) etc.
- No utensils shall be shared
- All employees shall sanitise their hands before and after using building plans Ablution Facilities
- All ablution facilities shall have a washing station or a sanitation station.
- Sufficient paper towels shall be available to dry off hands after sanitizing
- All ablution facilities must have a biochemical hazardous bin, with a medical waste bag that can be sealed
- Paper towels shall be discarded into the medical waste bin provided at the ablution facilities
- Ablution facilities must be cleaned on a more regular basis to ensure a clean surface at all times
- Chemical toilets ratio is reduced to 1-10 employees and flush toilets ratio is reduced 1-15 employees
- Cleaners must focus on the most touch areas when cleaning ablution facilities (toilet handles, door handles, taps, basins surfaces, toilet seats etc.)

Eating areas

The eating areas in construction is a high risk due to the fact that the employees under normal circumstances would have sit within 1, 5 Meter of each other.

- Eating areas will need to make bigger to accommodate all employees at once but still implement social distancing of 1, 5 Meter at least.
- All eating areas must have a biochemical hazardous bin, with a medical waste bag that can be sealed
- All Servite that was used or paper towels that was used to dry hands after using the sanitation station must be discarded in the hazardous bin.
- All eating areas shall have a washing station or a sanitation station
- Lunch breaks should be staggered between contractors / employees to ensure that during lunch the social distancing 1, 5 Meter can still be implemented.
- All chairs, Table tops and drinking water taps need to be cleaned after each lunch break
- Notice board shall be placed at the eating area to ensure that all employees see all posters and notices
- Clean drinking water need to be supplied to all employees at the eating area Waste management

The waste management on site will be a critical path and will need to be monitored. The PPE and cleaning material that will be discarded will be seen as medical (biological hazardous) waste. This will need to be separated from normal waste, all medical waste bins will need to have a waste bag that can seal and need to be removed by a registered service provider. Hazardous bins shall be foot operated to ensure employees do not touch the lid of the hazardous bin.

Paper towels

Paper towels shall be supplied to by the contractor at all sanitation stations and washing stations for employees to dry their hands. These towel papers will be discarded in the medical waste bins. The contractor shall ensure that sufficient paper towels is in storage for a fast and effective replacements

PPE

All disposable PPE shall be discarded in these medical waste bins. Disposable PPE will be the following: dust masks, surgical masks etc.

Disinfectants

The sanitizers that will be available throughout the site if finished and not refilled will be discarded as medical waste. The contractor must ensure that sufficient stock of hand sanitizer and soap is available in the storeroom. This chemicals and soap shall be recorded as it is booked out of the storeroom.

Wastewater

The water that will be used at the hand washing points will need be stored in acontainer with a lid. This infected water will then need to be treated before the water can be discarded in a normal municipal sewage system.

Biological hazardous waste bin

The hazardous waste bins that will be placed all over site will need to be a different colour from the normal waste bin. This hazardous waste bins will need the appropriate signage's as displayed below as well as a sealable bag inside. This is an example of the sign that needs to be visible on all hazardous waste bins on site:

The hazardous waste bin does not have a specific size that will be required, but the contractor will need to monitor the waste and accordingly let the registered service provider come and remove the waste. The waste can only be dumped at a Class 1 dumping site or be incinerated. The registered service provider will provide a certificate that it has been discarded at the class 1 dumping site or incinerated. Hazardous bins shall be foot operated to ensure employees do not touch the lid of the hazardous bin.

Personal Protective Equipment (PPE)

COVID 19 be prevented from spreading using the correct PPE. The COVID 19 virus is spread by small droplets that can be enter the body at the face through the nose, mouth and the eyes. This is the critical areas that must be protected at all cost to prevent the employees from getting the feared COVID 19 virus.

The disposable PPE will be treated as biological hazardous waste as explained above in waste management

The Contractor shall supply all employees with 2 cloth masks (1 to wear, 1 to wash). The cloth masks will be checked every morning at the entrance of the gate to ensure that employees are washing the cloth masks. This is an example of a cloth mask:

If the employees are working in a high risk area, the contractor will need to have a look at alternative measures to protect the employee's eyes as well as mouth and nose area. Face shields is a perfect example of an alternative way to protect our workers. There is different types of face shields on the market, from loose face shields with a strap to face shield and hard hat combination. Below is an example of these alternative equipment that will need to be in place in high risk areas when possible:

Employees will only be required to wear hand gloves when the task will require it (will be stipulated in the risk assessment). When for example the employee will do grinding work and the face shield will not last then the employee will be required to wear goggles and a normal dust mask.

Accommodation

When the contractor provides accommodation to the employees on site thefollowing shall be in place:

- The quantity of employees must be looked at that is accommodated on site
- The restrictions on the number of employees using the same ablution facilities
- Cutlery & utensils shall not be shares between employees
- Social distancing between employees (at least 1,5 Meter) when in sleeping quarters and in cooking facilities.
- The employees shall practice good personal hygiene and shall sanitise areas that on a regular basis is used by all employees
- Employees shall not share any personal belongings with each other for example: clothes & towels

Transportation

The transportation of employees shall be monitored by the site safety officer as well as site management. Transportation will be arranged that all employees at all times implement the social distance of at least 1, 5 Meter from each other.

Employee using transportation as well as drivers will at all times wear mask to prevent the spread of the virus. Employees shall sanitize their hands before using transportation and after using transportation. Transporting employees in big quantities must at all times be prevented if possible. All transport shall be disinfected before and after use. If employees drives with personal transport, sufficient parking must be made available

COVID 19 Signage's
The applicable signage's shall be displayed at all the applicable places for example all the notice boards that is identified in this document. The contractor shall as far as reasonable practicable post posters about COVID 19 to ensure that all employees know the essential information of the virus. The signage's will be essential to show employees with the use of pictograms what is the most important factors to keep in mind on site. All hand sanitation station shall have a sign that states it is a sanitation station and while have a poster to explain to employees exactly how to wash their hands to prevent getting infected.

This is examples of signs that shall be visible all over site to keep reminding employees of the risks. The site entrances shall get additional signage's to explain to visitor and employees the applicable PPE for the site. These signs is examples of signs that shall be visible at the site entrances:
COVID 19 Posters

The contractor will be responsible to display posters on all notice boards on site as stipulated to ensure that employees are informed of the COVID 19 virus. The responsibility is with the contractor to communicate these posters to the employees and the train them on all the precaution measures and the keep them informed.

4. Omissions from the Site Specific Health and Safety Specifications

Every endeavor has been made to address the most critical aspects relating to Health and Safety issues in order to assist the contractor in adequately providing for the Health and Safety of employees on site. However, the Principal Contractor is required to ensure they stay compliant with statutory requirements and construction programs and processesand include such aspects in their Health and Safety File.

ANNEXURE A

PRIMARY HEALTH AND SAFETY COMPLIANCE

The Principal Contractor and Contractors must submit compliance with Annexure 'A' beforecommencing on work on site. Compliance with Annexure 'A' must be maintained and proven to the Safety Agent at audits.

HSS Item no.	Requirement	Legal Reference	Compliance required:
A1	Health & Safety Plan (H& S Plan)	Constructions Regs.	Withing one weeks of receipt of these specifications
A2	Notification of intentionto commence construction / building work	Complete schedule 1 (Construction Regs.)	Before commencement onsite
A3	Assignment of responsible persons tosupervise constructionwork	OHS Act ~ Section 16(2) appointee ~ all written appointments under the construction regulations 2014	Before commencement onsite
A4	Competence of responsible persons in the form of CV's relatedwork history of appointees	OHS Act ~ Section 16(2) appointee ~ all written appointments under the construction regulations 2014	Together with H & S Plan
A5	Compensation for occupational injuries and diseases – proof of registration and in good standing	COIDA or FEMA	Together with H & S Plan
A6	Health and safety organogram showing all safety management portfolios and positions	Sekhukhune District Municipalityrequirement	Together with H & S Plan
A7	Initial hazard identification and risk assessment document	Construction regulations	Together with H & S Plan
A8	Fall protection plan (first draft) as defined in the construction regulations	Construction regulations	Together with H & S Plan

HSS = health & safety specifications

OHS Act = occupational health & safety ActCR = construction regulations

COIDA = compensation for occupational injuries and diseases Ac

ANNEXURE B

ASSIGNMENT OF PRINCIPAL CONTRACTOR'S AND CONTRACTORS'RESPONSIBLE PERSONS

The Principal Contractor must make all the management appointments as set out below.Compliance with annexure 'B' to be maintained and proven to the safety agent at audits (Further appointments could become necessary as the project progresses).

Item no.	Appointment	Legal Reference	Requirement
B1	CEO Assignee	Section 16(2)	A competent person to assist the CEO in achieving compliance with the OHS Act – P/Contractor's / Contractor's Responsible person
B2	Construction Work Manager	CR 8(1)	A full time competent person to Superviseand be responsible for health & safety related issues on site. The person isappointed by the Section 16(2)
B3	Assistant Construction Work Manager	CR 8(2)	A full time competent person(s) to assist the CR 8(1) appointee with daily supervision of construction work safety. One of the CR8(2) appointees must be designated to fulfill the role of the CR6(1)when such person is not on site. Make this clear in the appointment letter
B4	Health & Safety Representative(s)	Section 17	A competent person(S) to be appointed to represent the workforce in H & S matters.Reps may attend safety meetings, conduct monthly site audits, attend incident / injury investigations and make recommendations as far as H&S goes.
B5	Health & Safety Committee Member(s)	Sectin 19	H&S reps, site supervisors / foreman andthe safety officer should make up the committee, with the CR8(1) appointee chairing the committee.
B6	Incident Investigator	GAR 9	A competent person to head up the investigation team and co-ordinate incident / injury investigation ons site.
B7	Risk assessmentco-ordinator	CR9	A competent person to co-ordinate thedrafting / reviewing / distribution of risk assessments on behalf of the principal contractor. The same applies to contractors. NQF Level 5

B8	Fall protection plan co-ordinator	CR10	A competent person to co-ordinate thedrafting / reviewing / distribution of Fall Protection Plan. The same applies to contractors. NQF Level 4
B9	Emergency planco-ordinator	Contractor Needs to bein line with service stationERP	A competent person to co-ordinate the drafting / reviewing / distribution of the site emergency procedures / evacuationplan. Such person must be fulltime on site so as to take charge of emergency situations.
B10	First Aider(s)	GSR 3	A certified person to address first aid situations and take charge of injuries. Level 1 certificate
B11	Lifting machine and lifting tackle supervisor	DMR 18	A competent P/Contractor employee to co-ordinate the management of lifting machines and tackle, ensuring that suchequipment is safe for use at all times, inspected when necessary and repairedwhen required. The operators, banks men and contractors to liases with thisperson
B12	Scaffolding inspector	SANS 10085 – 2004	A competent person to inspect scaffoldingbefore use and every time after bad weather, etc.
B13	Scaffold supervisor (P/Contractor	SANS 10085 – 2004	A competent P/Contractor employee to supervise all scaffolding on site, ensuringthat scaffolds are safe for use, inspected,extended / altered, repaired when required and that all trades are co-ordinated and authorised to work on such scaffolds
B14	Scaffoldieng erector	SANS 10085 – 2004	A competent person(s) to erect scaffolding – leader of the scaffold team
B15	Formwork & support work supervisor (Temporary Works)	CR12	A competent person to supervise all formwork & support work erection & dismantling. This person must also ensure that the equipment is safe and that all the necessary inspections (pre, during, post & every day thereafter) are carried out & records kept by the competent inspectors. Desigh drawingsmust be available to this supervisor.
B16	Excavation supervisor / inspector	CR13	A competent person to supervise & inspect excavation work (daily) and ensure that excavations are safe. Records of inspections must be kept by this person.

B17	Ladder inspector	GSR13A	A competent person to inspect ladders daily and ensure they are safe for use,keeping monthly record.
B18	Stacking supervisor	CR28	A competent person to supervise all stacking and storage operations
B19	Explosive powered tools inspector / supervisor	CR21	A competent person to inspect & cleanthe tool daily, store the tool in a safe location, ensure that cartridges are signed out and in, and control all operations thereof.
B20	Temporary electrical installations inspector	CR24	A competent person to inspect all temporary electrical installations. Including weekly inspections and record keeping.
B21	Portable Electrical Tool Inspector	CR 24	A competent person to co-ordinate / inspect portable electrical tools, leads andplugs.
B22	Fire-fighting equipment inspector	CR29	A competent person to co-ordinate & inspect fire fighting equipment. Includingad-hoc checks and monthly inspections with records kept.
B23	Construction vehicles & mobile plant supervisor	CR23	A competent person(s) to co-ordinate thesafety of all construction vehicles & mobile plant. Ensuring that daily inspections are done and records kept, that safety measures are in place, that operators are certified and authorised to operate and that maintenance and services are carried out when required.
B24	Construction safety officer	CR8(6)	A competent person to fulfill the functionsas set out in these HSS

ANNEXURE C

GENERAL COMPLIANCE REQUIREMENTS

The Principal Contractor and Contractors must comply with but not be limited to the requirements tabled below: Prove compliance with annexure 'C' at audits conducted by thesafety agent.

Item no.	What	When	Output	Reviewed by Sekhukhune District Municipality Agent
C1	Construction – phase Health & Safety Plan	Monthly review	Principal Contractor to indicate the status of Contractors health & safety plans	
C2	Health & Safety File(s)	Open file when construction begins and maintain throughout	Have file on hand at audits. Contractors to report on their file at monthly health & safety audits by the Principal Contractor.	
C3	OHS Act and relevant Regulations	Monthly review	To be kept in the health &safety file on site.	
C4	Health & Safety Induction training, PTW Procedures	Every worker before he/she starts work	Attendance registers tobe kept	
C5	Awareness Training (Tool Box Talks)	At least oncea week	Attendance registers tobe kept	
C6	Health & Safety Meetings	Monthly	Meeting minutes to bekept	
C7	Health & Safety Reports	Monthly	Report covering: • Incidents / injuries and investigations • Non conformances by employees & Contractors – reports • Internal H&S audit reports	

C8	Audits on contractors	Monthly	Report covering: • H&S File / Plan • WCA status • Appointmentletters • Section 37(2) agreements • Risk assessment &safe work procedures • Physical site inspection • Any other contractor specific requirements	
C9	Emergency procedured	Monthly evaluation of procedure	Compile written procedure as well as tel. Numbers	
C10	Risk assessments & fall protection plan	Updated and signed off	Documented risk assessments to be available	
C11	Method statements	Drawn up and distributed before workers are exposed to the risks	Documented set of method statements reviewed and signed off.	
C12	General Inspections	Daily	Report OHS Act compliance: • Excavations • Portable electricaltools • Formwork &support work • Explosive poweredtools	
C13	General Inspections	Daily	• Scaffolding • Temporary Electrical Installations	
C14	General Inspections	Monthly	•Fire fighting equipment •Ladders	
C15	General Inspections	Monthly	• Lifting tackle • Oxy-acetylene cutting & welding sets • Fall prevention and arrest equipment	

C16	General Inspections	6-Monthly	• Lifting machines	
C17	Load tests / performance tests	Annually / once erected,before use	• Lifting machines	
C18	List of Contractors	List to be updated weekly	Compile a list of contractors: Name, supervisor, company tel. Numbers and trade.	
C19	Workman's Compensation	Ongoing	Compile a list of Contractors workman's Compensation proof of good standing.	
C20	Construction site rules & Section 37(2) Mandatary Agreements	Ongoing	Compile a list of all signed up Mandataries.Proof of agreement documents to be kept in H&S file.	

ANNEXURE D

OCCUPATIONAL HEALTH & SAFETY – HEALTH & SAFETY COSTS TO BE INCLUDED IN THE PRINCIPAL CONTRACTOR'S / CONTRACTORS' PRICE

In terms of the Construction Regulations (2014), it is the Sekhukhune District Municipality's duty to ensure that the cost for health & safety has been provided for by the Principal Contractor,before appointment.
Acting on behalf of our Sekhukhune District Municipality, we require the following health & safety costs to be included by the Principal Contractor. It must be made very clear that these are just someof the health & safety costs to be included in your tender price. It is the duty of the Principal Contractor and Contractors to ensure that all aspects of the Occupational Health & safety Act 85/1993 and Construction Regulations are catered for.

Pricing for Occupational Health and Safety measures should include the following ifapplicable:

ITEM	DESCRIPTION
1	Supply of all items of Personal Protective Clothing/Equipment & ensure use thereof for full compliance
1.1	Steel toe capped safety boots
1.2	Overalls
1.3	Reflective vests(high visibility)
1.4	Hard hats
1.5	Dust masks
1.6	Hearing protection
1.7	Hand gloves
1.8	Any other :Principal Contractor to specify
2	Supply and provision of Equipment for working at Heights & ensure use thereof for full compliance
2.1	Fall protection equipment (Safety Harness)
2.2	Double lanyard harness
2.3	Fall protection plan
2.4	Scaffolding access ladders/toe boards/hand rails
2.5	Portable Ladders
2.6	Any other: Principal Contractor to specify :
3	Barricading: Supply & install, including removal upon completion to ensurefull compliance to legislation
3.1	Rigid type barricading
3.2	Temporary fence barricading along perimeter of excavated area
3.3	Danger tape pre-warning tape
3.4	Any other: Principal Contractor to specify :
4	Related Training
4.1	First Aid Training

4.2	Health and Safety Representative training
4.3	Emergency Rescue training(Height)
4.4	Hazard Identification Training
4.5	Training of Personnel working at heights
4.6	Construction Plant Training
4.7	Legal Liability(OHSACT) Training
4.8	COID ACT Training
4.9	Scaffold Erector and Inspector Training
4.10	Any other: Contractor to specify : Working at elevated
5	Occupational Health and Safety Administration
5.1	Develop of a Site Specific Health and Safety Plan and Hazard and Risk Assessment by Competent person.
5.2	Develop of Fall Protection and Rescue Plan by a Competent Fall Protection PlanDeveloper.
5.3	Competent Occupational Health and Safety Officer/Consultant.
6	Medical Surveillance
6.1	Medical Certificates of fitness for all Employees by an Occupational Health Practitioner.
6.2	Medical Certificates of fitness for all EPWP Employees by an Occupational Practitioner during the duration of the Construction Project.
7	Facilities and Equipment
7.1	Sanitary facility for each sex and for every 30 workers.
7.2	Changing facilities for each sex.
7.3	Sheltered eating areas
7.4	First aid boxes
7.5	Fire extinguishers
7.6	Waste bins
8	Safety Signage
8.1	Sufficient and adequate safety signage on constructions site and at all flammablestores.

ANNEXURE E

The Occupational health and Safety File must consist out of the following documentation:

INDEX

1	Appointment Letter from Sekhukhune District Municipality.
2	Notification of Construction work.
3	Letter of Good standing - COID
4	Copy of Public Liability Insurance Policy and UIF Registration
5	Health and Safety Specifications
6	Scope of Work
7	Tool and Machinery list
8	Method Statement of all work that will be conducted.
9	Risk Assessment Guide / Procedure
10	Baseline Risk Assessments
11	Safe Work Procedures for all Risks
12	Health and Safety Information from Designer
13	Medical Certificates/Copy of ID'S and Personal Information
14	All Health and Safety Related Policies
15	Section 37.2 Agreements
16	Induction Training Information
17	Site Specific Emergency numbers and Emergency Plan
18	Site Specific Covid – 19 Management Plan
19	Site Specific Health and Safety Plan
20	Incident / Accident Management Control
21	Traffic Management Plan
22	Contractor Control Procedures
23	Environmental Management
24	Hazardous Chemical Substance Register and MSDS
25	Example of Monthly Health and Safety Report
26	Health and Safety Organogram
27	Occupational Health and Safety (Construction) Appointments – With Competencies
28	Certificates for all lifting equipment
29	Sample of all registers that will be used on site.
30	Copy of Construction Building Plans (A4)
31	Copy of the Occupational Health and Safety Act and Construction Regulations2014

ANNEXURE F

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993

(Regulation 4 of the Construction Regulations. 2014)

NOTIFICATION OF CONSTRUCTION WORK

1. (a) Name and postal address of principal contractor:

_____

(b) Name and tel. No of principal contractor's contact person:

_____

2. Principal contractor's compensation registration number:

_____

3. (a) Name and postal address of Sekhukhune District Municipality :

_____

(b) Name and tel. No of Sekhukhune District Municipality's contact person or agent:

_____

4. (a) Name and postal address of designer(s) for the project:

_____

(b) Name and tel. No of designer(s) contact person:

5. Name and telephone number of principal contractor's construction supervisor on site appointed in terms of regulation 8(1).

6. Name/s of principal contractor's sub-ordinate supervisors on site appointed in terms of regulation 8(2).

7. Exact physical address of the construction site or site office:

8. Nature of the construction work

9. Expected commencement date: _____

10. Expected completion date: _____

11. Estimated maximum number of persons on the construction site.

Total:_____Male:_____Female: _____

12. Planned number of contractors on the construction site accountable to principal

Contractor: _____

13. Name(s) of contractors already selected.

Principal Contractor Date

Sekhukhune District Municipality's Agent (where applicable) Date

Sekhukhune District Municipality Date

➢ THIS DOCUMENT IS TO BE FORWARDED TO THE OFFICE OF THE DEPARTMENTOF LABOUR PRIOR TO COMMENCEMENT OF WORK ON SITE.

Copies:

1. Original to Department

C3.8 REFERENCES TO THE SCOPE OF WORKS IN TERMS OF THE ENVIRONMENTAL MANAGEMENT PLAN

1. INTRODUCTION

The EMP will address the environmental impacts during the design, construction and operational phases of a project. Due regard must be given to environmental protection during the entire road project. In order to achieve this a number of environmental specifications/recommendations are made. These are aimed at ensuring that the Contractor maintains adequate control over the project in order to:

Minimise the extent of impact during construction,
Ensure appropriate restoration of areas affected by construction.
Prevent long term environmental degradation.

The Contractor must be made aware of the environmental obligations that are stipulated in this document, and declares himself/herself to be conversant of all relevant environmental legislation. The Contractor should also be aware that the Engineer will monitor the implementation of the procedures.

2. POLICY STATEMENT

The construction will be to the best management practices as identified to minimize the environmental impact of activities associated with the development.

3. OBJECTIVES OF THE EMP

The EMP has the following goals:

Identifying those construction activities that may have a detrimental impact on the environment;
Detailing the mitigation measures that will need to be taken, and the procedures for their implementation;
Establishing the reporting system to be undertaken during the construction.

The EMP also serves to highlight specific requirements that will be monitored during the development and should the environmental impacts not have been satisfactory prevented or mitigated; corrective action will have to be taken. The document should, therefore, be seen as a guideline that will assist in minimising the potential environmental impact of activities.

4. DESIGNATED ENVIRONMENTAL OFFICER

For the purpose of the EMP, a nominated representative of the Contractor should be the designated environmental officer for the project. The nominated representative of the Contractor will therefore be responsible for ensuring that the provisions of the EMP are complied with. The Engineer will be responsible for issuing instructions to the Contractor where environmental considerations call for action to be taken. The environmental officer will submit monthly reports to the Engineer on site who will verify the information.

5. LEGAL REQUIREMENTS

Under normal circumstances and EMP would be the end result or the final stage in the EIA procedure. However, a working agreement was negotiated between the National Department of Environmental Affairs and Tourism (DEAT) and the Sekhukhune District Municipality Metropolitan Municipality. The agreement stipulates the project types the

Sekhukhune District Municipality Metropolitan Municipality need to submit to DEAT for approval and those project types the Sekhukhune District Municipality Metropolitan Municipality do not need to submit for approval. For those actions that do not need approval, the Sekhukhune District Municipality Metropolitan Municipality undertook to compile generic EMP's to assist to minimising degradation to the area. The following project types fall in this non-approval category: periodic maintenance, special maintenance, rehabilitation and specific upgrades.

6. MITIGATION MEASURES

In setting mitigation measures, the practical implications of executing these measures must be borne in mind. With early planning, both the cost and the impacts can be minimised.

6.1 Establishment of site offices

6.1.1 Site plan

The Contractor shall provide the Engineer on site with a plan detailing the layout of site offices facilities, such as chemical toilets, areas for stockpiling of material, storage of hazardous materials and provision of containers. 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 site, and in particular the ablution facilities, aggregate stockpiles and hazardous material stockpiles are located as far away as possible from any water course as possible.

The site plan shall be submitted before the site hand over meeting. Read with Standard Specifications for Municipal Civil Engineering Works: Section 001 and 002.

6.1.2 Vegetation

The vegetation surrounding the site offices is to be left as intact as possible and vegetation planted at the site should be indigenous. Only trees directly affected by the works and such others as may be indicated by the Engineer in writing may be sawn off/removed.

The project specification for the rehabilitation of the grass cover shall be strictly adhered to. Any proclaimed weed or alien invader plant shall be cleared by hand before seeding. Read with Specifications: 104 – Landscaping and grassing.

6.1.3 Rehabilitation

The site offices will require rehabilitation at the end of the Contract. All construction material, including concrete slabs and braai areas are to be removed from the site on completion of the Contract. Read with Specifications Sections 001, 002 and 104.

6.1.4 Water for human consumption

Water for human consumption must be tested and treated in accordance with recommendations.

6.2 Sewage treatment

Adequate toilet facilities are to be provided. Use of the veld for this purpose shall not, under any circumstances, be allowed. The Contractor 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. Latrines shall be positioned within walking distance from wherever employees are employed on the works.

Save and effective sewage treatment will require one of the following sewage handling methods: septic tanks and soak always, dry composting toilets such as “enviro loos”, or the use of chemical toilets which are supplied and maintained by a Sub-Contract. 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 is to be done in consultation with the Site Engineer.

Read with Specifications 104.

6.3 Waste management

Waste management and waste minimisation must be implemented at the outset of the Contract.

6.3.1 Litter

No littering by construction workers are allowed. During the construction period, the facilities shall be maintained in a neat and tidy condition and the site is to be kept free of litter. Read with Specifications Sections 001 and 002.

6.3.2 Removal of solid waste

Solid waste is to be stored in an appointed area for collection and disposal. A refuse control system must be established for the collection and removal of refuse to the satisfaction of the Engineer. Disposal of solid waste will be in a Department of Water and Sanitation (DWS) licensed landfill site.

6.3.3 Hazardous waste

Hazardous waste such as bitumen, tar, oils, etc. shall be disposed of in a Department of Water Affairs and Forestry approved landfill site. Special care must be taken when using tar products such as tar prime or pre-coating fluid to avoid water-soluble phenols form entering the ground or contaminating water.

6.4 Soil management

6.4.1 Topsoil

The Contract provides for the stripping and stockpiling of topsoil from the site for later reuse. Topsoil is considered to be of a minimum thickness of $\pm$ 300 mm of the natural soil, including all the vegetation and organic matter. The areas to be cleared of topsoil shall include the storage areas. Weeds appearing on the stockpiled topsoil shall be removed by hand before seeding. Soils contaminated by hazardous substances shall be disposed of in an approved Department of Water Affairs and Forestry waste disposal site.

6.4.2 Borrow material

The Contractor’s attention is drawn to the requirements set forth by the Department of Mineral and Energy Affairs in terms of the submission of EMPR’s for establishment, operation and rehabilitation of borrow pits and quarries. The cost of complying with the

requirements shall be deemed to be included in existing rates in the schedule of quantities. Read with the Specification Section 203.

6.5 Discovery of archaeological sites, artifacts or graves

6.5.1 Archaeological site

If an artefact on site is uncovered, work in the immediate vicinity must 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 must be contacted who will appoint and archaeological consultant. Work may only resume once clearance is given in writing by the archaeologist. Read with General Conditions of Contract.

6.5.2 Graves

If a grave on site is uncovered, work in the immediate vicinity must be stopped and an undertaker as well as the National Monuments Council should be contacted. The undertaker will place advertisements in the newspapers concerning the grave. He will also provide for the relocation of bones, should it be necessary. Read with General Conditions of Contract.

6.6 Stockpiled material

The Contractor shall so plan his activities 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 must be indicated and demarcated on the site plan and approved in writing by the engineer.

The area chosen shall be devoid of indigenous trees and shrubs. Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. After the stockpiled material has been removed, the site shall be reinstated as closely as possible to its original condition. All areas affected by stockpiling shall be landscaped, top soiled and grassed to the Employer's Agent's approval and at the Contractor's cost.

Material milled out of the existing road surface that is temporarily stockpiled within the road reserve shall:

- be stockpiled so as to be as inconspicuous as possible
- be prevented form contaminating water courses,
- be cleared of weeds.

In all cases, the areas for stockpiling and disposal of construction rubble shall be approved by the Engineer before such operation commences.

Read with Series 2: Earthworks – Section 203.

6.7 Fuel, diesel and other hazardous materials

6.7.1 Hazardous materials

All hazardous materials i.e., bitumen binders shall be stored in an appointed area that is fenced and has restricted entry. Storage of bituminous products shall only take place using suitable containers to the approval of the Engineer.

Under no circumstances shall the spoiling of bituminous products on the site, over embankments, in borrow pits or any burying, be allowed. Unused or rejected bituminous products shall be taken to the supplier's production plant. No spillage of bituminous products shall be allowed on site. Affected areas shall be promptly reinstated to the satisfaction of the Engineer.

6.7.2 Fuel

Should any fuel storage tank be required on site, the Contractor shall ensure that he has complied with the necessary legal requirements for the erection of such tanks. Leakage must be avoided. The fuel and diesel must be stored in a bunded area with adequate containment (at least 1,5 times the volume of the fuel) for potential spills and leaks.

6.7.3 Oil, grease

Oil, grease and cleaning materials from the maintenance of vehicles and machinery shall be collected in a sump and sent back to the supplier or, otherwise disposed of at a registered site.

6.7.4 Cooking oil

The Contractor should ensure that sufficient fuel is available for heating and cooking purposes should this be necessary.

6.7.5 Spillages

Streams, rivers and dams must 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 bituminous products. In the event of a spillage, prompt action must be taken by competent instances to clear the affected area.

6.8 General considerations

Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a designated register and the response noted with the date and action taken. This record must be submitted with the monthly reports.

Any avoidable non-compliance with the above-mentioned measures may be considered sufficient ground for withholding payment of part or all amounts to be paid for the said item.

6. MEASUREMENT AND PAYMENT

The Contractor shall not be separately reimbursed or compensated in respect of his compliance with the provisions of this part of the Scope of Works. All costs so incurred shall, save and except to the extent provided for the schedule of quantities under SECTION 001: GENERAL REQUIREMENTS AND CHARGES, be deemed to be included in the rates tendered for the various items of work listed in the schedule of quantities.

TABLE 1 SUMMARY OF MITIGATION MEASURES

ENVIRONMENTAL COMPONENT	*ACTIVITY*	*MITIGATION*	*RELEVANT SECTION IN SPECIFICATIONS*
Establishment of site offices	*Siting of offices*	*Preferred areas would be flat areas along the route. Avoid steep areas as soil erosion could increase. Avoid water courses*	*001* *002.02.01*
	Site Plan	*Contractor will provide engineer detail of layout of site facilities within two weeks of moving to the site i.e. chemical toilets, the demarcation of areas for stockpiling of materials, storage of hazardous materials and the provision of containers. The offices shall be fenced. The site plan will be submitted before the site hand over meeting.*	*001* *002*
Site rehabilitation	*Cleanup*	*All construction material is to be removed from the site on completion of the Contract.*	*001* *002* *104*
Vegetation	*On site*	*Vegetation planted on the site should be indigenous. Only trees directly affected by works as indicated in writing by Engineer, shall be sawn off/removed*	*104*
	Weeds	*Clearance of weeds must be done by hand before seeding.*	*104*
	Grass cover	*The grass cover surrounding the construc-tion site is to be left as intact as possible or restored to its original condition.*	*104*

ENVIRONMENTAL COMPONENT	*ACTIVITY*	*MITIGATION*	*RELEVANT SECTION IN SPECIFICATIONS*
Water	*Available for human consumption*	*Water for human consumption must be tested and treated in accordance with recommendations.*	
Soil management	*Topsoil*	*The topsoil (± 300 mm) of any excavation shall be removed and stockpiled separately from underlying material in an appointment area*	*203* *104*
	Borrow material	*EMPR's for borrow pits to be submitted to the Department of Mineral and Energy Affairs for approval*	*201* *203*
Archaeological & Cultural sites	*Discover of archaeological sites of artefacts*	*If an artefact on site is uncovered, work in the immediate vicinity must be stopped immediately and an archaeological consultant must be contacted. Work may only resume once clearance is given in writing by the archaeologist.*	*GCC*
Graves	*Discovery of graves*	*If a grave on site is uncovered, work in the immediate vicinity must be stopped and an undertaker should be contacted*	*GCC*
Waste management	*Solid & Construction waste*	*Solid waste is to be stored in an appointment area for collection and disposal. Disposal of waste will be in a DWAF licensed landfill, and no waste may be burnt on site.*	
	Litter	*The site is to be kept free of litter*	*001*
Sewage treatment	*Toilet facilities*	*Adequate toilet facilities are to be provided, and*	*001* *002*

ENVIRONMENTAL COMPONENT	*ACTIVITY*	*MITIGATION*	*RELEVANT SECTION IN SPECIFICATIONS*
		the siting of chemical toilets is to be done in consultation with the site engineer. Use of the veld for this purpose shall not be allowed.	
Fuel, diesel & hazardous materials	*Hazardous Materials*	*All hazardous materials i.e. bitumen binders will be stored in an appointed area that is fenced and has restricted entry. No spoiling of bituminous products on site, over embankments, in borrow pits or any burning. No spillage of bituminous products shall be allowed on site.*	
	Fuels	*All fuel tanks will be stored in an appointed area. Leakage will be avoided.*	
	Cooking fuel	*The Contractor should ensure that sufficient fuel is available for heating and cooking purposes should this be necessary.*	
	Oil, grease	*Oil, grease and cleaning materials from maintenance of vehicles shall be collected in a sump and sent back to supplier.*	
	Spillages	*Streams, rivers or dams must be protected against spillages of pollutants mentioned in 6.7 (e). In the event of a spillage, prompt action must be taken to clear the affected area.*	
General considerations	*Lines of authority*	*A nominated representative of the Contractor will be the*	*RELEVANT SECTION IN SPECIFICATIONS*

ENVIRONMENTAL COMPONENT	*ACTIVITY*	*MITIGATION*	*RELEVANT SECTION IN SPECIFICATIONS*
		designated environmental officer for the site.	
	Reports	*The environmental officer will submit monthly reports to the Engineer who will verify the information*	
	Complaints	*Complaints received regarding activities on the construction site pertaining to the environment should be recorded in a designated register, and the response noted with the date and action taken. This record must be submitted with the monthly report*	

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

C4 Site Information

C4.1 LOCALITY PLAN

SEKHUKHUNE DISTRICT MUNICIPALITY

LIMPOPO PROVINCE

GROBLERSDAL LUCKAU BULK WATER SUPPLY - CONTRACT 1C

C4 Site Information

C4.2 TENDER DRAWINGS

LIST OF DRAWINGS

DRAWING No.	DESCRIPTION	SHEET No.
17005/04/00	DRAWING LIST	1 OF 1
17005/04/01	NAMEBOARD DETAILS	1 OF 1
17005/04/02	OVERALL LAYOUT	1 OF 1
17005/04/03	SCHEMATIC LAYOUT	1 OF 1
17005/04/04	WTW TO MOTETEMA RESERVOIRS & SUMP KEY PLAN	1 OF 1
17005/04/05	WTW TO MOTETEMA RESERVOIRS LONG SECTIONS	5 OF 5
17005/04/06	WTW TO MOTETEMA SUMP LONG SECTIONS	6 OF 6
17005/04/07	OLIFANTS RIVER CROSSING DETAILS	1 OF 1
17005/04/08	ROAD CROSSING DETAILS	1 OF 1
17005/04/09	SCOUR VALVE CHAMBER DETAILS	1 OF 1
17005/04/10	AIR VALVE CHAMBER DETAILS	2 OF 2
17005/04/11	WATER METER CHAMBER DETAILS	1 OF 1
17005/04/12	THRUST BLOCK DETAILS	1 OF 1
17005/04/13	PIPE MARKER DETAILS	1 OF 1
17005/04/14	PIPE BEDDING DETAILS	1 OF 1

No	DATE	REVISION	CONSULT	DIR
A	10/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	J.M
CHECKED BY	A.C
DRAWN BY	B.M
CHECKED BY	F.M
SIGNATURE	.....

CLIENT

SEKHUKHUNE DISTRICT MUNICIPALITY
3 WEST STREET
GROBLERSDAL
0490
TEL: 013 262 7300
FAX: 013 262 3688

CONSULTANT

HWA
Engineers & Project Managers

24A RISSIK STREET
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0700
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FAX: 086 246 0744
EMAIL: admin@hwaeng.co.za

PROJECT NAME

GROBLERSDAL LUCKAU BWS-PHASE 1

DRAWING TITLE

DRAWING LIST

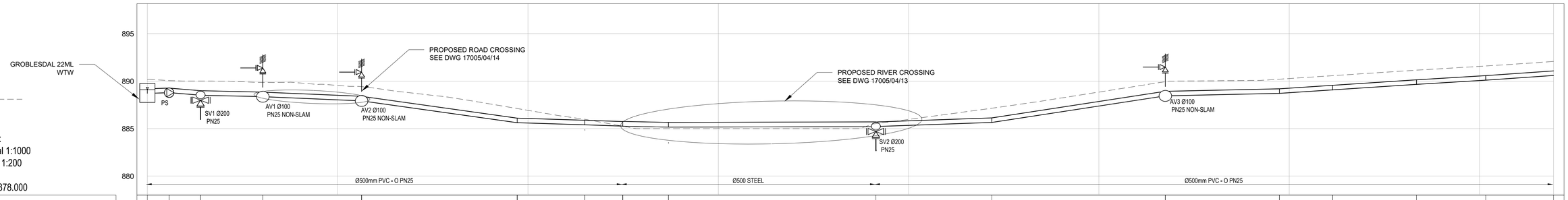
DRAWING No.
17005/04/00

CONTRACT No.

SCALE
NTS

REVISION No.
A

SHEET No.
SHEET 1 OF 1



REFERENCE	R0	P0	B317	B303	B306	B308	B315	B316	B310	B309	B307	B301	B299	B298	B297	B295	
DISTANCE (m)	0.000	11.442	27.959	60.653	112.577	194.320	229.830	249.791	273.813	382.813	443.757	534.909	594.851	622.813	666.891	703.249	753.078
GROUND LEVEL	891.177	891.624	890.668	891.000	891.496	890.366	889.842	889.801	890.043	186.729	890.271	890.363	890.642	890.976	891.417	892.838	
PIPE INVERT LEVEL	888.717	888.795	888.523	888.373	887.931	885.629	885.406	885.258	885.155	885.232	885.658	888.458	888.718	889.086	889.667	890.106	890.806
HYDRAULICS DESIGN Q(l/s)		194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84
HYDRAULICS DESIGN V(m/s)		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2
HGL	895.704	895.681	1057.206	1057.140	1057.035	1056.869	1056.797	1056.757	1056.723	1056.564	1056.440	1056.255	1056.134	1056.077	1055.988	1055.914	

LONGSECTION ALIGNMENT
FROM 0.000 TO 738.897

No	DATE	REVISION	CONSULT	DIR
A	08/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	J.M
CHECKED BY	A.C
DRAWN BY	B.M
CHECKED BY	F.M
SIGNATURE	.....

CLIENT
SEKHUKHUNE DISTRICT MUNICIPALITY
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PROJECT NAME
GROBLERSDAL LUCKAU BWS-PHASE 1

DRAWING TITLE
GROBLERSDAL WTW TO MOTETEMA 0.2ML SUMP PIPELINE LONGITUDINAL SECTION

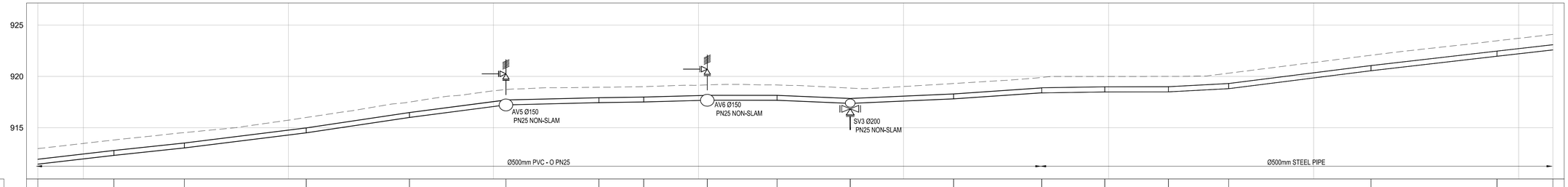
DRAWING No. 17005/04/04

REVISION No. A

CONTRACT No.

SCALE 1:1000

SHEET No. SHEET 01 OF 05



NGL – – – – –

SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 910.000

REFERENCE			B256	B253	B246	B237	B230	B225	B224	B221	B222	B228	B219	B216	B215	B213	B211	B204	B200							
DISTANCE (m)		1417.602	1514.913	1549.266	1608.716	1659.046	1706.103	1751.439	1773.309	1804.298	1838.327	1874.001	1924.394	1967.410	1998.146	2029.191	2058.548	2127.979	2189.388	2246.618						
GROUND LEVEL			915.990	916.983	918.349	919.497	920.060	920.705	920.985	921.056	921.477	920.988	920.464	920.236	920.698	920.997	921.696	923.494	925.196							
PIPE INVERT LEVEL		910.066	912.314	913.033	914.507	916.009	917.227	917.452	917.512	917.685	917.679	917.374	917.819	918.390	918.485	918.494	918.807	920.554	921.965	923.261						
HYDRAULICS	DESIGN Q(l/s)		194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84						
	DESIGN V(m/s)		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.0	1.0						
HGL			1054.269	1054.199	1054.078	1053.976	1053.881	1053.789	1053.745	1053.682	1053.613	1053.541	1053.439	1053.351	1053.307	1053.261	1053.218	1053.116	1053.026							

LONGSECTION ALIGNMENT
FROM 1477.794 TO 2216.690

No	DATE	REVISION	CONSULT	DIR
A	11/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	J.M
CHECKED BY	A.C
DRAWN BY	B.M
CHECKED BY	F.M
SIGNATURE	.....

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PROJECT NAME
GROBLERSDAL LUCKAU BWS-PHASE 1

DRAWING TITLE
GROBLERSDAL WTW TO MOTETEMA 0.2ML SUMP PIPELINE LONG SECTION AND LAYOUT

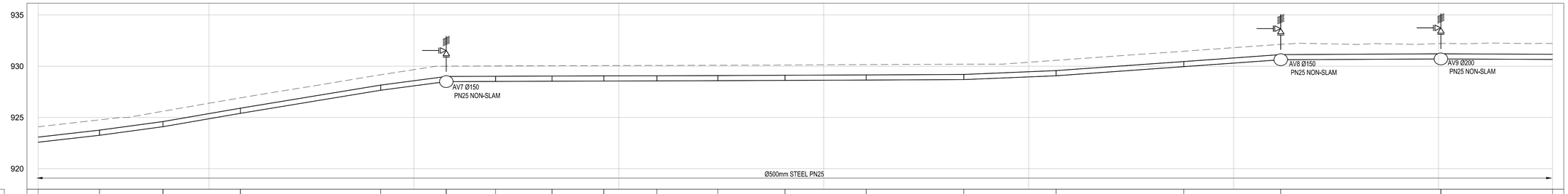
DRAWING No.
17005/04/04

CONTRACT No.

SCALE
1:1000

REVISION No.
A

SHEET No.
SHEET 03 OF 05



NGL – – – – –

SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 918.000

REFERENCE			B195	B190	B184	B173	B169	B167	B166	B165	B164	B163	B162	B161	B160	B157	B152	B145	B141				
DISTANCE (m)		2189.388	2246.618	2277.586	2315.394	2383.819	2415.845	2439.868	2467.409	2492.718	2518.602	2548.393	2581.115	2620.730	2668.351	2713.394	2775.693	2823.012	2901.150	2986.597			
GROUND LEVEL			926.532	927.442	928.025	929.562	930.130	930.550	931.045	931.444	931.993	931.999	932.491	932.497	932.499	932.500	932.500	931.989	931.503				
PIPE INVERT LEVEL		921.965	923.261	924.098	925.405	927.669	928.500	928.519	928.540	928.557	928.570	928.589	928.618	928.651	928.697	929.072	929.960	930.634	930.711	930.641			
HYDRAULICS	DESIGN Q(l/s)		194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84			
	DESIGN V(m/s)		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
HGL			1052.943	1052.897	1052.842	1052.742	1052.695	1052.660	1052.619	1052.582	1052.544	1052.501	1052.453	1052.395	1052.325	1052.259	1052.168	1052.099	1051.984				

LONGSECTION ALIGNMENT
FROM 2216.690 TO 2955.587

No	DATE	REVISION	CONSULT	DIR
A	11/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	J.M
CHECKED BY	A.C
DRAWN BY	B.M
CHECKED BY	F.M
SIGNATURE	.....

CLIENT
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PROJECT NAME
GROBLERSDAL LUCKAU BWS-PHASE 1

DRAWING TITLE
GROBLERSDAL WTW TO MOTETEMA 0.2ML SUMP PIPELINE LONG SECTION AND LAYOUT

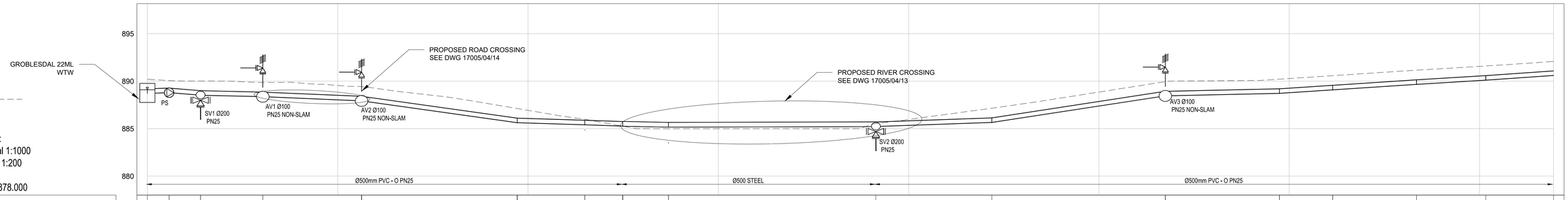
DRAWING No.
17005/04/06

CONTRACT No.

SCALE
1:1000

REVISION No.
A

SHEET No.
SHEET 04 OF 14



SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 878.000

REFERENCE		R0	P0	B317	B303	B306	B308	B315	B316	B310	B309	B307	B301	B299	B298	B297	B295				
DISTANCE (m)		0.000	11.442	27.959	60.653	112.577	194.320	229.830	249.791	273.813	382.813	443.757	534.909	594.851	622.813	666.891	703.249	753.078			
GROUND LEVEL		891.177	891.624	890.668	891.000	891.496	890.366	889.842	889.801	890.043	186.729	890.271	890.363	890.642	890.976	891.417	892.838				
PIPE INVERT LEVEL		888.717	888.795	888.523	888.373	887.931	885.629	885.406	885.258	885.155	885.232	885.658	888.458	888.718	889.086	889.667	890.106	890.806			
HYDRAULICS	DESIGN Q(l/s)		194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84	194.84			
	DESIGN V(m/s)		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2			
HGL		895.704	895.681	1057.206	1057.140	1057.035	1056.869	1056.797	1056.757	1056.723	1056.564	1056.440	1056.255	1056.134	1056.077	1055.988	1055.914				

LONGSECTION ALIGNMENT
FROM 0.000 TO 738.897

No	DATE	REVISION	CONSULT	DIR
A	08/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	J.M
CHECKED BY	A.C
DRAWN BY	B.M
CHECKED BY	F.M
SIGNATURE	.....

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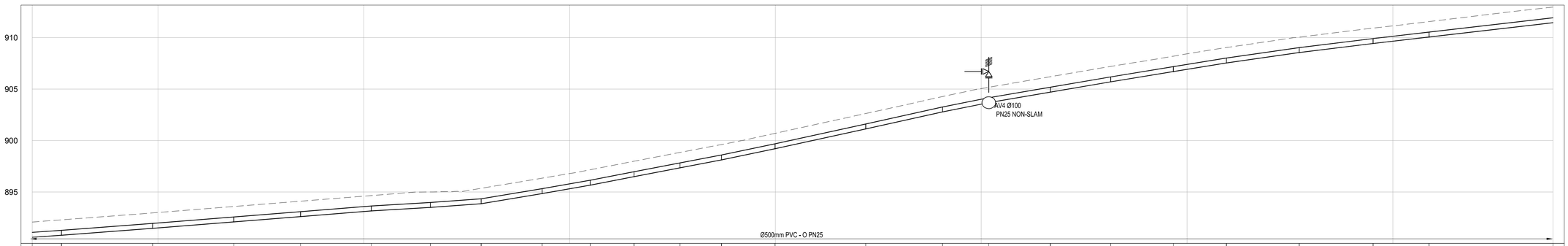
PROJECT NAME
GROBLERSDAL LUCKAU BWS-PHASE 1

DRAWING TITLE
GROBLERSDAL WTW TO MOTETEMA 0.2ML SUMP PIPELINE LONGITUDINAL SECTION

DRAWING No. 17005/04/05
REVISION No. A
CONTRACT No.
SCALE 1:1000
SHEET No. SHEET 01 OF 05



SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 890.000

REFERENCE			B294		B293		B292		B291		B290		B289		B288		B286		B285		B284		B283		B282		B281		B280		B279		B278		B277		B276		B274		B273		B270		B266		B264	
DISTANCE (m)	703.249		753.078		797.395		836.822		869.291		903.638		932.330		957.025		986.612		1010.009		1031.272		1053.579		1073.835		1099.804		1143.877		1181.217		1203.675		1233.636		1262.893		1293.352		1319.140		1354.482		1390.376		1417.602		1514.913
GROUND LEVEL			893.073		893.482		893.962		894.419		895.000		895.715		896.430		897.649		898.723		900.231		901.129		901.676		902.488		903.901		905.234		906.155		907.183		908.223		909.495		910.243		911.314		912.353		913.284		
PIPE INVERT LEVEL	890.106		890.806		891.479		892.104		892.620		893.165		893.511		893.870		894.853		895.671		896.498		897.354		898.125		899.210		901.135		902.785		903.687		904.714		905.710		906.707		907.545		908.554		909.434		910.066		912.314
HYDRAULICS DESIGN Q(l/s)			194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84		194.84	
HYDRAULICS DESIGN V(m/s)			1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2		1.2	
HGL			1055.813		1055.724		1055.644		1055.578		1055.508		1055.450		1055.400		1055.340		1055.292		1055.249		1055.204		1055.163		1055.110		1055.021		1054.945		1054.900		1054.839		1054.780		1054.718		1054.666		1054.594		1054.521		1054.466		

LONGSECTION ALIGNMENT
FROM 738.897 TO 1477.794

No	DATE	REVISION	CONSULT	DIR
A	11/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	J.M
CHECKED BY	A.C
DRAWN BY	B.M
CHECKED BY	F.M
SIGNATURE	.....

CLIENT
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EMAIL: admin@hwaeng.co.za

PROJECT NAME
GROBLERSDAL LUCKAU BWS-PHASE 1

DRAWING TITLE
GROBLERSDAL WTW TO MOTETEMA 0.2ML SUMP PIPELINE LONG SECTION AND LAYOUT

DRAWING No. 17005/04/04

REVISION No. A

CONTRACT No.

SCALE 1:1000

SHEET No. SHEET 02 OF 05

GROBLERSDAL 22ML WTW
PROPOSED PUMP STATION
EXISTING RIVER CROSSING (OLIFANTS)
Ø315mm PVC-O PN25
Ø300mm STEEL PIPE
Ø315mm PVC-O PN25
AV1
SV1
AV2
AV3
SV3
R2
RES
P0
B301
B300
B178
B176
B179
B181
B295
B298
B296
B183
B184
B182
B299
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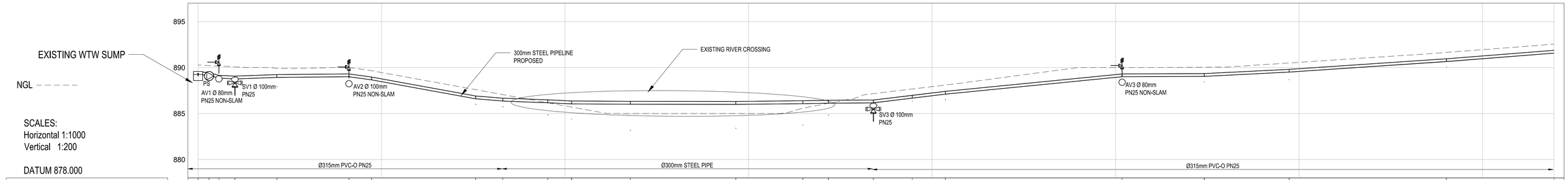
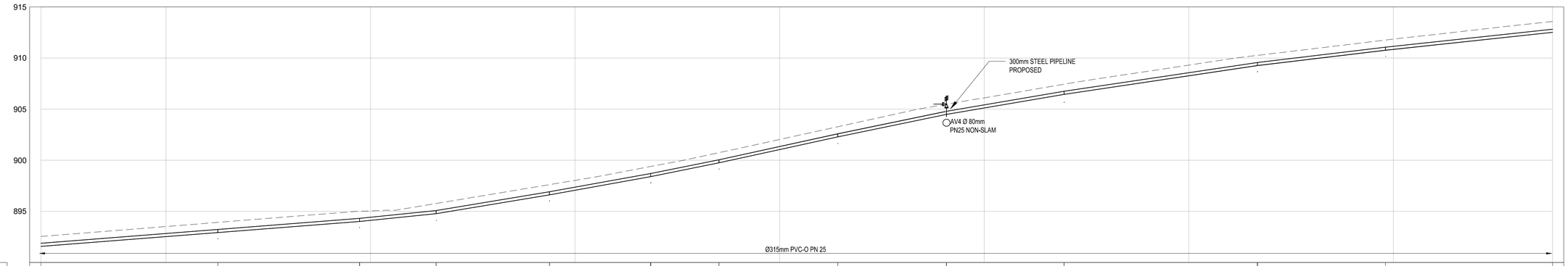
B174
B173
B172


EXISTING WTW SUMP
NGL
SCALES:
Horizontal 1:1000
Vertical 1:200
DATUM 878.000
895
890
885
880
PS
AV1 Ø 80mm PN25 NON-SLAM
SV1 Ø 100mm PN25
AV2 Ø 100mm PN25 NON-SLAM
300mm STEEL PIPELINE PROPOSED
EXISTING RIVER CROSSING
SV3 Ø 100mm PN25
AV3 Ø 80mm PN25 NON-SLAM
Ø315mm PVC-O PN25
Ø300mm STEEL PIPE
Ø315mm PVC-O PN25

| | | |



SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 890.000

REFERENCE			B172	B171	B170	B169	B168	B167	B166	B165	B164	B159	B156	
DISTANCE (m)	680.309	825.355	894.680	932.109	987.467	1036.967	1070.354	1128.431	1181.539	1239.046	1333.564	1396.126	1527.660	
GROUND LEVEL														
PIPE INVERT LEVEL	890.661	892.930	894.018	894.781	896.621	898.403	899.750	902.291	904.490	906.450	909.267	910.768	913.594	
HYDRAULICS	DESIGN Q(l/s)	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	
	DESIGN V(m/s)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
HGL			1103.849	1103.816	1103.799	1103.772	1103.749	1103.733	1103.705	1103.680	1103.653	1103.608	1103.579	

LONGSECTION ALIGNMENT
FROM 738.897 TO 1477.794

No	DATE	REVISION	CONSULT	DIR
A	08/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	F.M
CHECKED BY	A.C
DRAWN BY	O.S
CHECKED BY	J.M
APPROVED BY	ALEX CHIUSWA
SIGNATURE	.....

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PROJECT NAME
GROBLERSDAL LUCKAU BWS-PHASE 1

DRAWING TITLE
GROBLERSDAL WTW TO MOTETEMA 4.5ML CONCRETE RESERVOIRS
PIPELINE AND LONG SECTION LAYOUT

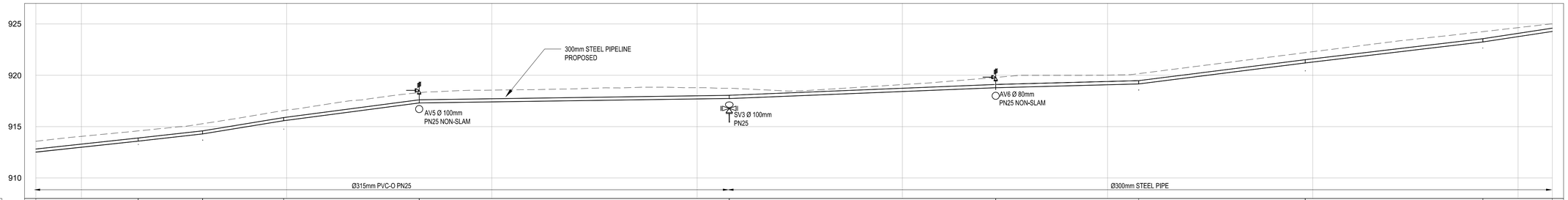
DRAWING No.
17005/04/05

CONTRACT No.

SCALE
1:1000

REVISION No.
A

SHEET No.
SHEET 02 OF 06



NGL – – – – –

SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 908.000

REFERENCE			B293	B151	B148	B145	B143	B139	B136	B133	B129	
DISTANCE (m)		1396.126	1527.660	1559.025	1598.564	1664.564	1815.663	1945.468	2015.134	2096.297	2182.825	2324.390
GROUND LEVEL			914.583	915.281	916.571	918.304	918.735	919.790	920.159	922.202	924.248	
PIPE INVERT LEVEL		910.768	913.594	914.291	915.582	917.314	917.786	918.790	919.159	921.202	923.248	927.527
HYDRAULICS	DESIGN Q(l/s)		26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06
	DESIGN V(m/s)		0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
HGL			1103.516	1103.501	1103.483	1103.451	1103.380	1103.336	1103.313	1103.285	1103.256	

LONGSECTION ALIGNMENT
FROM 1477.794 TO 2216.690

No	DATE	REVISION	CONSULT	DIR
A	08/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	F.M
CHECKED BY	A.C
DRAWN BY	O.S
CHECKED BY	J.M
APPROVED BY	ALEX CHIUSWA
SIGNATURE	.....

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PROJECT NAME
GROBLERSDAL LUCKAU BWS-PHASE 1

DRAWING TITLE
GROBLERSDAL WTW TO MOTETEMA 4.5ML CONCRETE RESERVOIRS
PIPELINE AND LONG SECTION LAYOUT

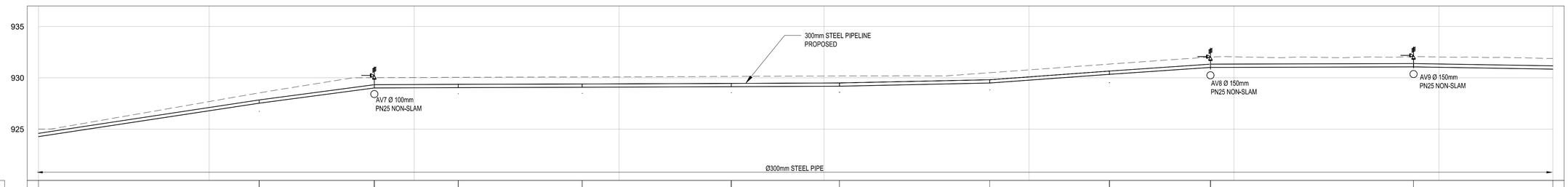
DRAWING No.
17005/04/05

CONTRACT No.

SCALE
1:1000

REVISION No.
A

SHEET No.
SHEET 03 OF 06



SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 920.000

REFERENCE			B120	B118	B117	B116	B115	B114	B113	B109	B106	B105	
DISTANCE (m)	2182.825	2324.390	2380.564	2421.480	2481.982	2554.734	2607.521	2680.835	2739.255	2788.529	2887.623	2990.779	
GROUND LEVEL		928.527	930.012	930.048	930.082	930.135	930.184	930.496	931.340	932.015	932.070		
PIPE INVERT LEVEL	923.248	927.527	929.012	929.048	929.082	929.135	929.184	929.496	930.340	931.015	931.070	930.735	
HYDRAULICS	DESIGN Q(l/s)	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	
	DESIGN V(m/s)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
HGL		1103.208	1103.189	1103.175	1103.155	1103.130	1103.112	1103.088	1103.068	1103.051	1103.018		

LONGSECTION ALIGNMENT
FROM 2216.690 TO 2955.587

No	DATE	REVISION	CONSULT	DIR
A	08/2022	FOR TENDER	J.M	

NOTES

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SIGNATURE	.....

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PROJECT NAME
GROBLERSDAL LUCKAU BWS-PHASE 1

DRAWING TITLE
GROBLERSDAL WTW TO MOTETEMA 4.5ML CONCRETE RESERVOIRS
PIPELINE AND LONG SECTION LAYOUT

DRAWING No.
17005/04/05

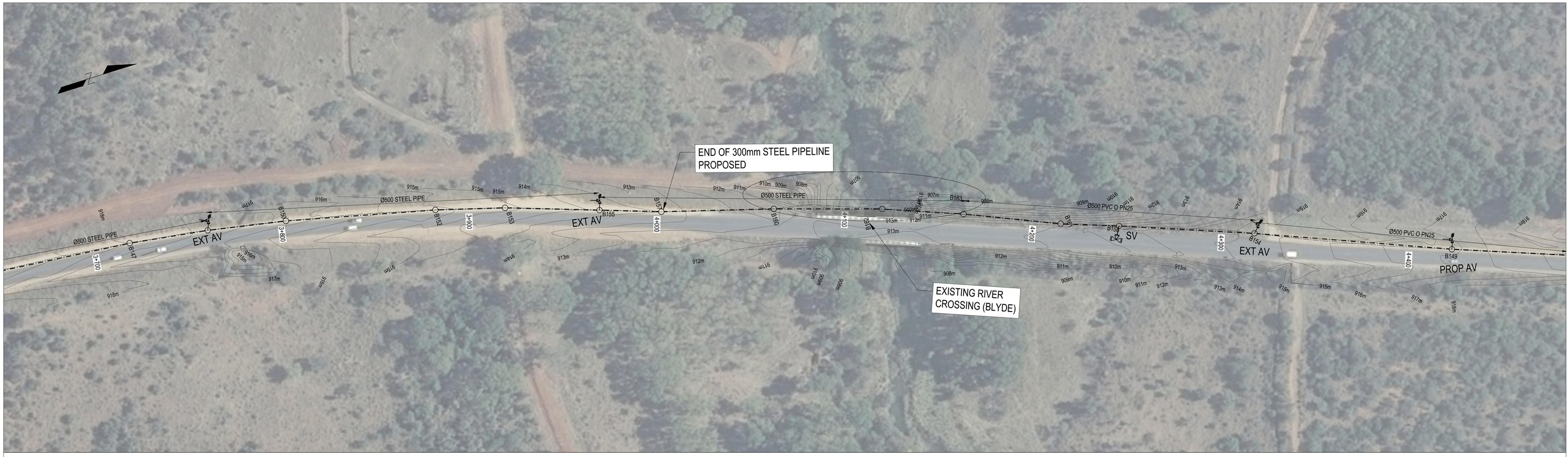
CONTRACT No.

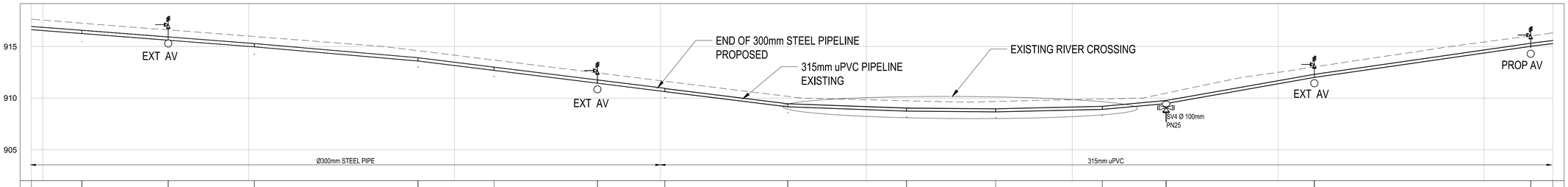
SCALE
1:1000

REVISION No.
A

SHEET No.
SHEET 04 OF 06

B105
2+300
Ø300mm STEEL PIPE
B107
2+600
B108
931m
930m
926m
928m
926m
927m
926m
926m
926





SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 902.000

REFERENCE			B147	B290	B150	B152	B153	B155	B157	B160	B162	B163	B161	B158	B154	B149										
DISTANCE (m)		3642.612	3719.016	3760.948	3802.756	3882.271	3919.189	3969.377	4002.169	4061.824	4119.560	4162.793	4214.560	4245.564	4317.564	4422.629	4513.933									
GROUND LEVEL			917.259	916.614	915.969	914.596	913.688	912.447	911.636	910.164	909.745	909.673	909.914	910.479	913.019	916.030										
PIPE INVERT LEVEL		917.413	916.259	915.614	914.969	913.596	912.688	911.447	910.636	909.164	908.745	908.673	908.914	909.479	912.019	915.030	917.238									
HYDRAULICS	DESIGN Q(l/s)		26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06	26.06									
	DESIGN V(m/s)		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4									
HGL			1102.737	1102.723	1102.709	1102.682	1102.670	1102.653	1102.642	1102.606	1102.572	1102.546	1102.515	1102.497	1102.454	1102.391										

LONGSECTION ALIGNMENT
FROM 3694.484 TO 4433.381

No	DATE	REVISION	CONSULT	DIR
A	08/2022	FOR TENDER	J.M	

NOTES

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SIGNATURE	.....

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PROJECT NAME
GROBLERSDAL LUCKAU BWS-PHASE 1

DRAWING TITLE
GROBLERSDAL WTW TO MOTETEMA 4.5ML CONCRETE RESERVOIRS
PIPELINE AND LONG SECTION LAYOUT

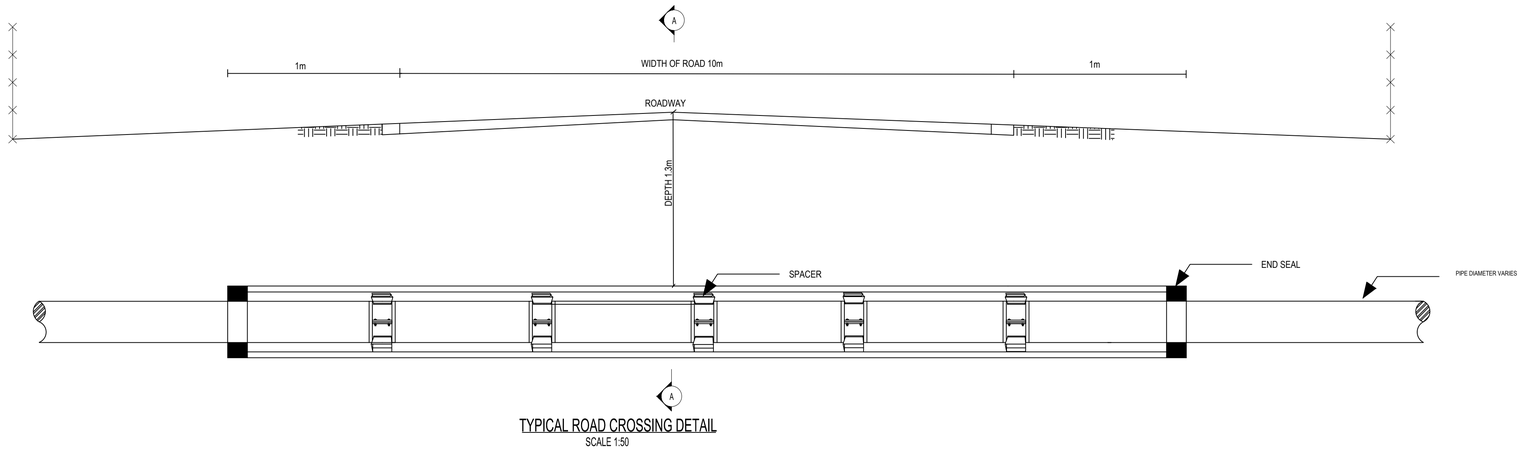
DRAWING No.
17005/04/05

CONTRACT No.

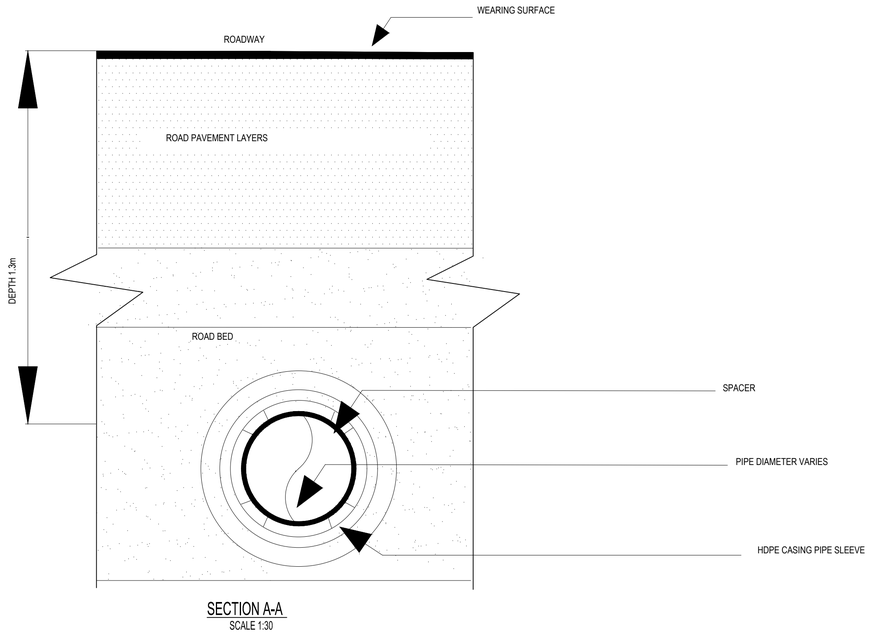
SCALE
1:1000

REVISION No.
A

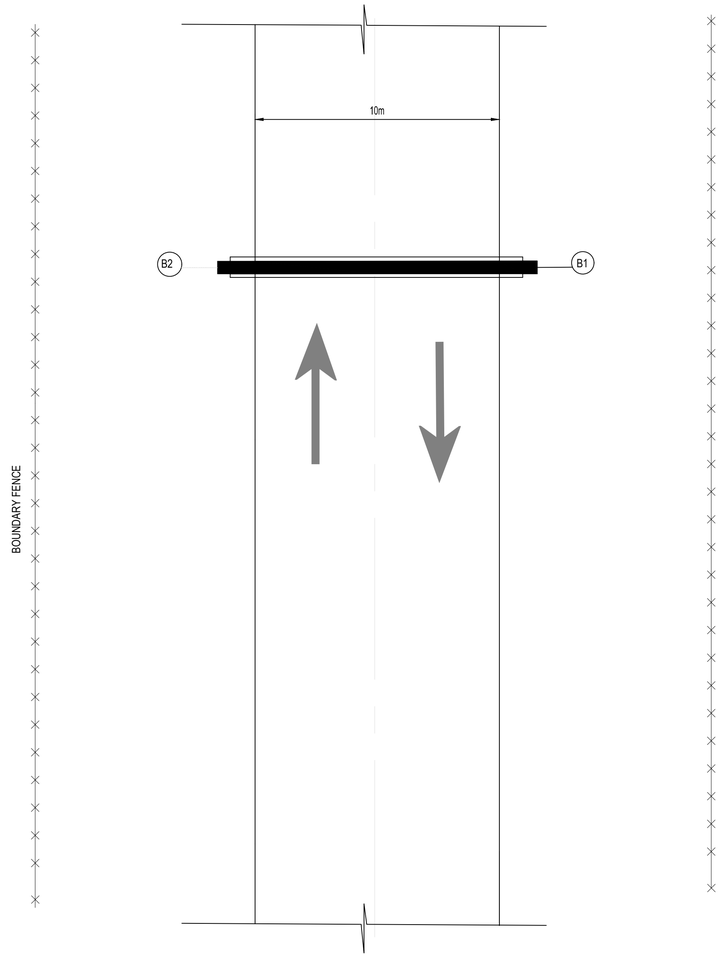
SHEET No.
SHEET 06 OF 06



TYPICAL ROAD CROSSING DETAIL
SCALE 1:50



SECTION A-A
SCALE 1:30



GENERAL LAYOUT
SCALE 1:60

No	DATE	REVISION	CONSULT	DIR
A	11/2022	FOR TENDER	J.M	

NOTES

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PROJECT NAME

GROBLERSDAL LAKAU BWS

DRAWING TITLE

ROAD CROSSING

DRAWING No.
17005/04/08

CONTRACT No.

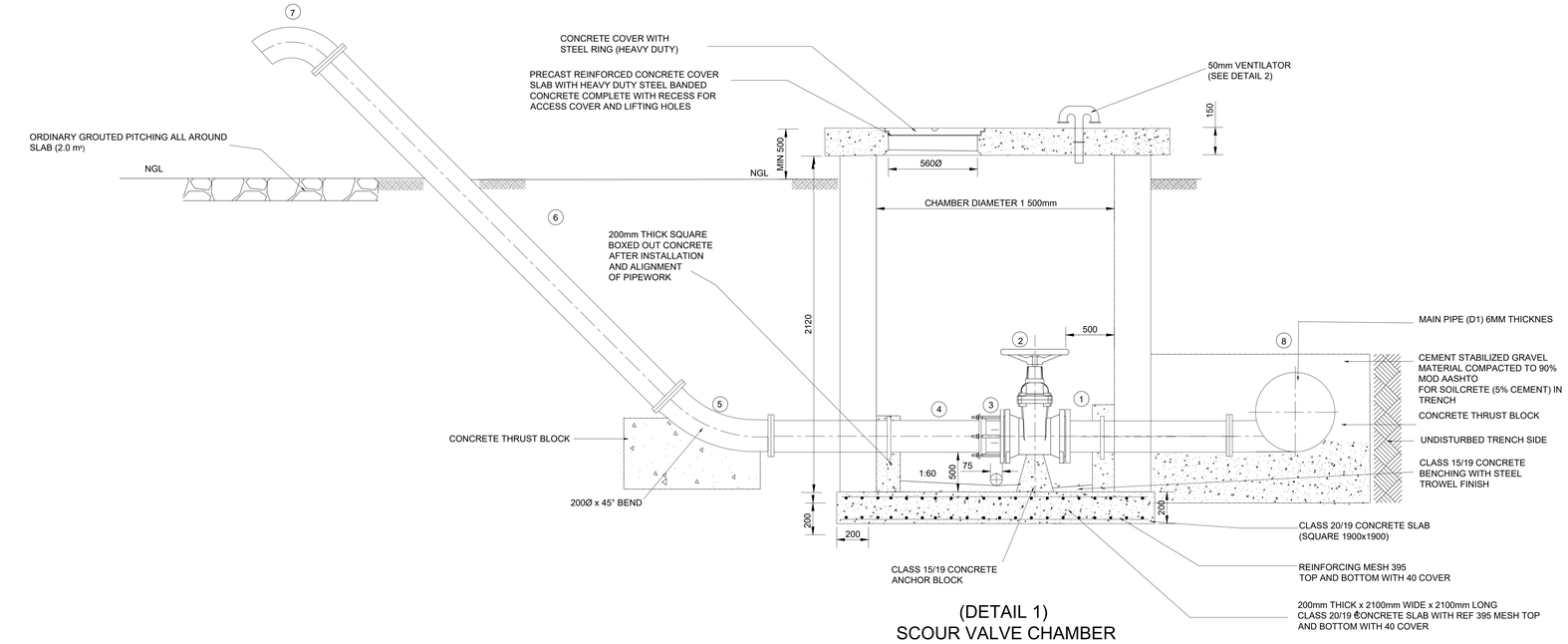
SCALE
AS SHOWN

REVISION No.
A

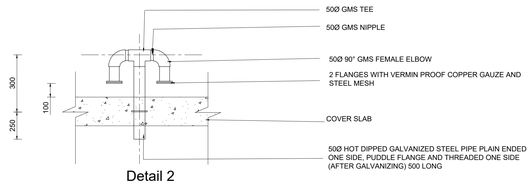
SHEET No.
SHEET 1 OF 1

PIPE FITTING SCHEDULE (Ø500) MAIN PIPE(D1)						
ITEM NO.	NO. OFF	DESCRIPTION	SKETCH	MATERIAL	STEEL GRADE	FLANGE DRILLING
1	2	Ø200mm STEEL PIPE, x 533mm LONG, FLANGED BOTH ENDS and PUDDLE FLANGE	533	EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	TABLE 25
2	1	Ø200mm GATE VALVE FLANGED BOTH ENDS		STANDARD ITEM		
3	1	Ø200mm VJ COUPLING		STANDARD ITEM		
4	1	Ø200mm STEEL PIPE, x 600mm LONG, FLANGED BOTH ENDS WITH PUDDLE FLANGE	600	EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	
5	1	Ø200mm 45° BEND FLANGED BOTH ENDS Ø200mm STEEL PIPE Min	644		GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	
6	1	1500mm LONG FLANGED BOTH ENDS WITH PUDDLE FLANGE	1500		GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	
7	1	Ø200mm 90° BEND FLANGED ONE END		EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	
8	1	D1 x Ø200mm Unequal TEE, 620mm x 699 LONG FLANGED BOTH ENDS	260 620	EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	

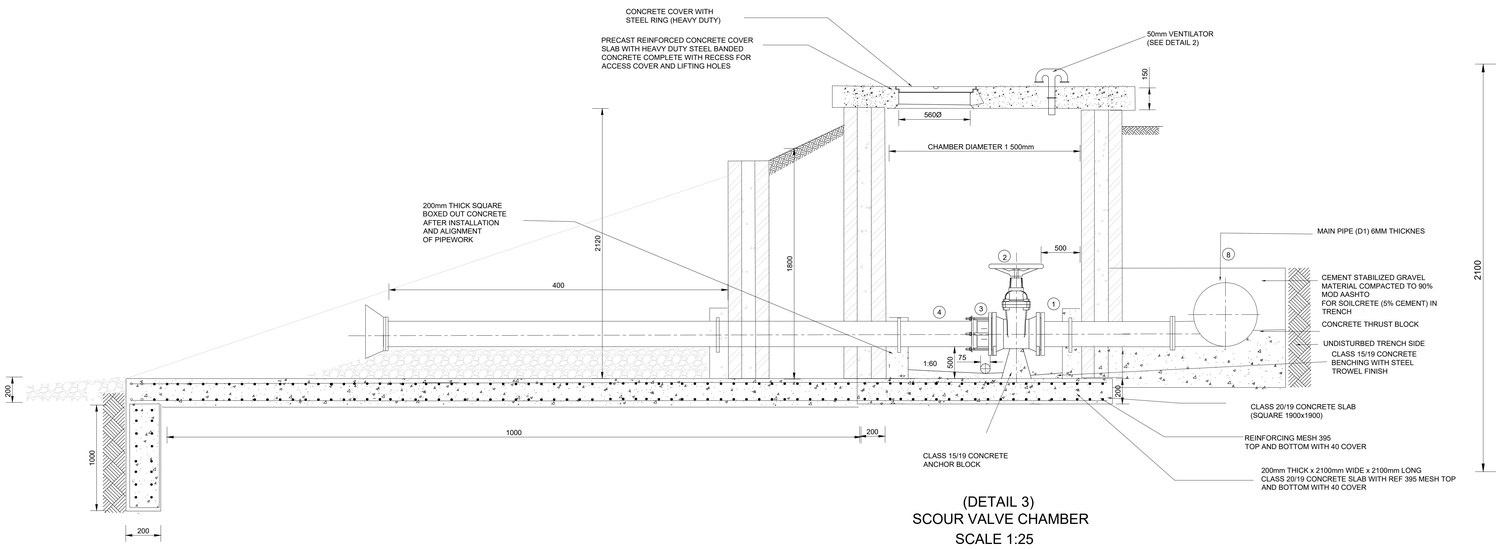
PIPE FITTING SCHEDULE (Ø300) MAIN PIPE (D1)						
ITEM NO.	NO. OFF	DESCRIPTION	SKETCH	MATERIAL	STEEL GRADE	FLANGE DRILLING
1	2	Ø100mm STEEL PIPE, x 623mm LONG, FLANGE, FLANGED BOTH ENDS WITH PUDDLE FLANGE	623	EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	TABLE 25
2	1	Ø100mm GATE VALVE FLANGED BOTH ENDS		STANDARD ITEM		
3	1	Ø100mm VJ COUPLING		STANDARD ITEM		
4	1	Ø100mm STEEL PIPE, x 600m LONG FLANGE, FLANGED BOTH ENDS WITH PUDDLE FLANGE	600	EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	
5	1	Ø100mm 45° BEND FLANGE, FLANGED BOTH ENDS	430	EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	
6	1	Ø100mm STEEL PIPE MIN 1500mm LONG FLANGE, FLANGED BOTH ENDS	1500	EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	
7	1	Ø100mm X 90° STEEL PIPE BEND FLANGE ONE END	300 300	EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	
8	1	D1 x Ø100mm UNEQUAL TEE, 610mm x 455mm LONG FLANGED ONE ENDS	155 610	EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICK) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	



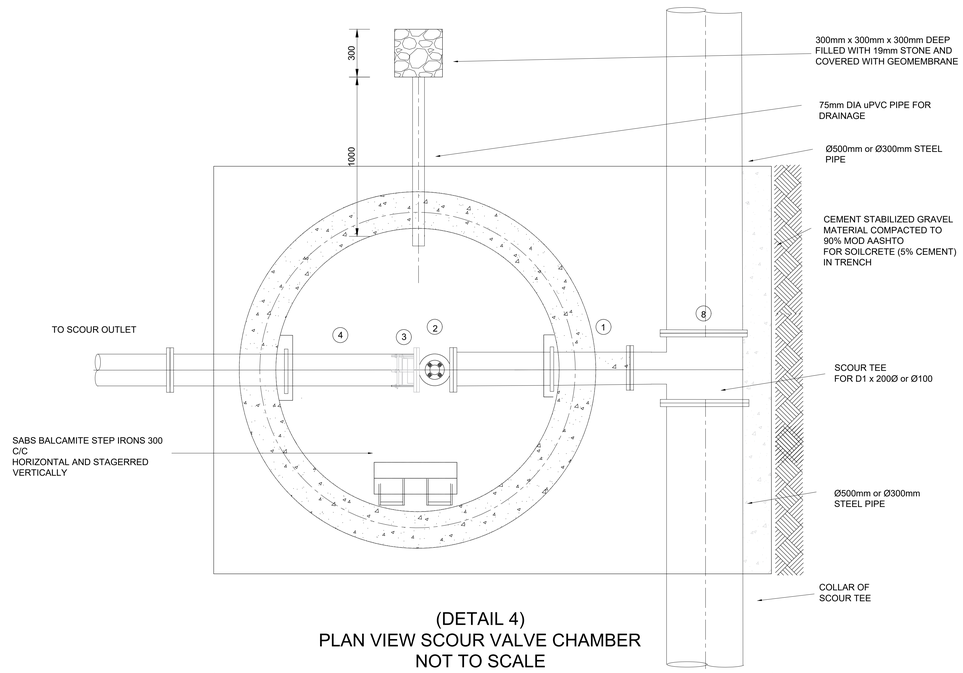
(DETAIL 1)
SCOUR VALVE CHAMBER
SCALE 1:20



Detail 2
VENTILATOR (1 OFF)
(NOT TO SCALE)



(DETAIL 3)
SCOUR VALVE CHAMBER
SCALE 1:25



(DETAIL 4)
PLAN VIEW SCOUR VALVE CHAMBER
NOT TO SCALE

No	DATE	REVISION	CONSULT	DIR
A	08/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	J.M
CHECKED BY	A.C
DRAWN BY	O.S
CHECKED BY	F.M
SIGNATURE	.....

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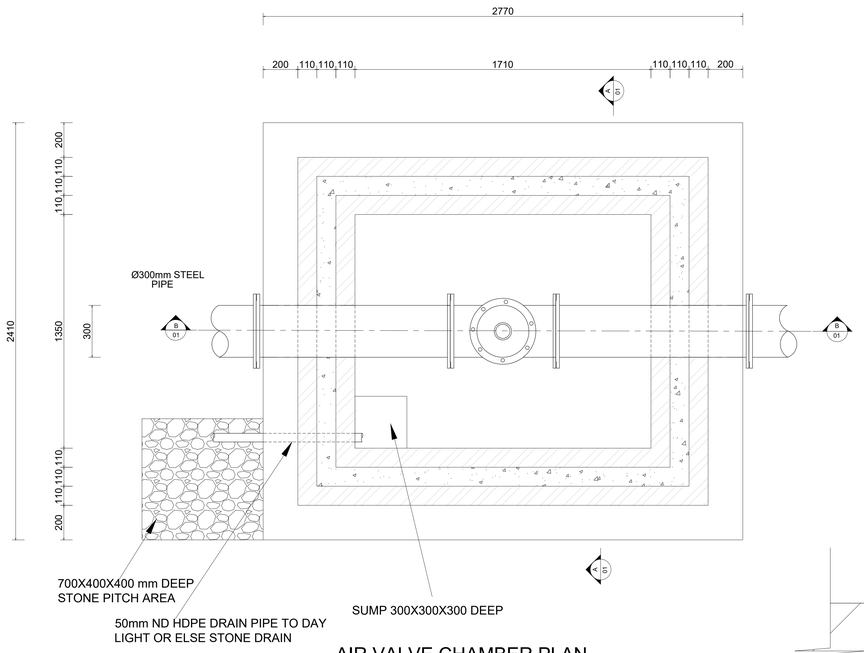
PROJECT NAME

GROBLERSDAL-LAKAU BWS-PHASE 1

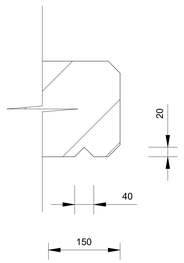
DRAWING TITLE

SCOUR VALVE DETAILS (Ø500mm AND Ø300mm)

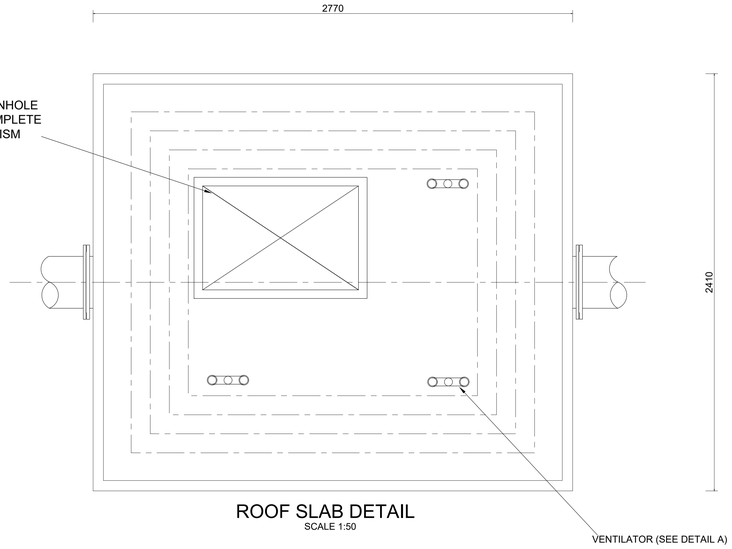
DRAWING No.	17005/04/09
CONTRACT No.	
SCALE	AS SHOWN
REVISION No.	A
SHEET No.	SHEET 1 OF 1



AIR VALVE CHAMBER PLAN
SCALE 1:50



DETAIL 01
SCALE 1:20



ROOF SLAB DETAIL
SCALE 1:50

NOTES

ALL REINFORCED CONCRETE WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH SABS 1200G AND AND PSG IN THE CONTRACT DOCUMENT AND AS MAY BE AMENDED OR ADDED THEREAFTER.

1. DATUM AS PER GENERAL LAYOUT PLAN.
2. UNLESS OTHERWISE STATED ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS IN METERS.
3. NO SCALING OF DIMENSIONS IS PERMITTED. ALL DIMENSIONS ARE TO BE CHECKED AND ANY DISCREPANCIES REPORTED TO THE ENGINEER IMMEDIATELY.

4. FOUNDATION

4.1 DEPTHS OF ALL BASES SHALL BE SHOWN ON THE DRAWINGS AND BE FINALLY APPROVED ON SITE BY THE ENGINEER PRIOR TO PLACING OF REINFORCEMENT OR CONCRETE.
4.2 ALL BASES SHALL BE CAST ON A MINIMUM LAYER OF 50mm BLINDING.
4.3 BLINDING LAYERS SHALL NOT EXCEED 250mm IN THICKNESS.

5. CONCRETE

5.1 CONCRETE TO BE MINIMUM STRENGTH MIX DESIGN OF:
5.1.1 CLASS 15/19 IN BLINDING LAYERS;
5.1.2 CLASS 25/19 IN WALL FOUNDATIONS, FLOOR AND ROOF SLABS, AND;
5.1.3 CLASS 25/19 IN RESERVOIR WALL, UNLESS OTHERWISE STATED.

5.2 MINIMUM COVER TO REINFORCEMENT INCLUDING LINKS SHALL BE:
5.2.1 50mm FOR FOUNDATION SLABS AND FOOTINGS;
5.2.2 50mm FOR WALLS AND COLUMNS, AND;
5.2.3 30mm FOR ROOF SLABS ON CHAMBERS, UNLESS OTHERWISE INDICATED.

6. REINFORCING

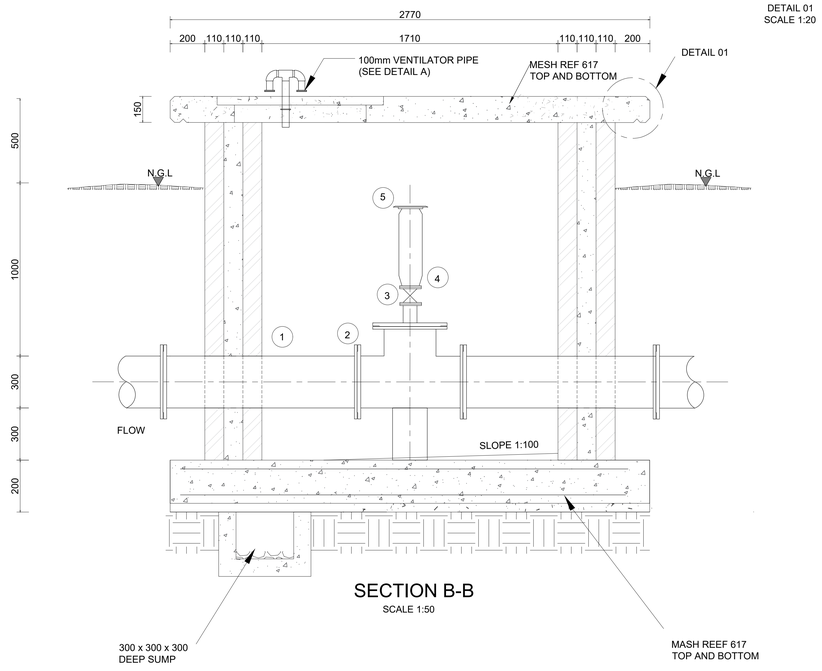
6.1 ALL REINFORCING STEEL SHALL BE WIRE BRUSHED AND KEPT CLEAN AND FREE OF ANY MILL SCALE, RUST, OIL OR ANY OTHER DELETERIOUS COMPOUNDS.
6.2 WELDING ON REINFORCEMENT STEEL WILL NOT BE PERMITTED.
6.3 ALL REINFORCING STEEL FIXED IN POSITION ON SITE SHALL BE CHECKED BY THE ENGINEER PRIOR TO CONCRETING.

7 FORM WORK

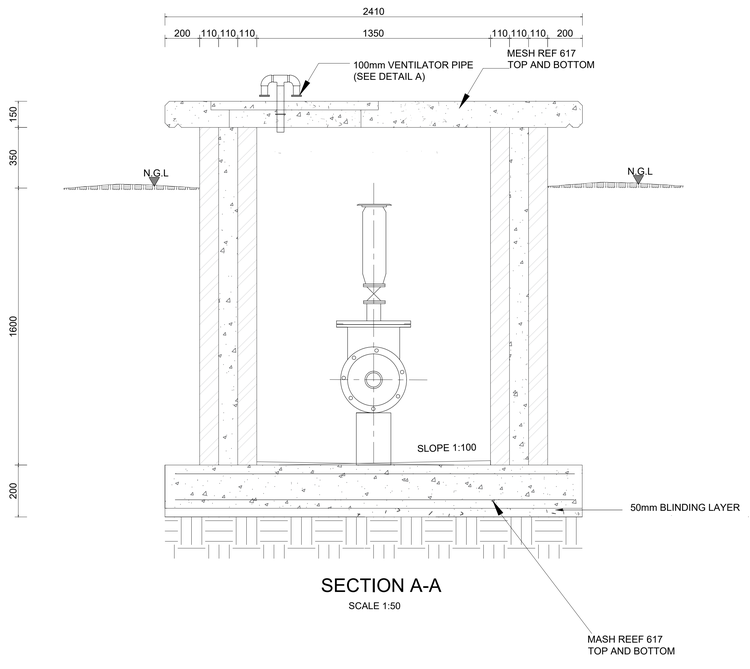
7.1 FORM WORK SHALL BE ERECTED AND FIXED IN AN APPROVED MANNER AND SHALL BE INSPECTED BY THE ENGINEER PRIOR TO CONCRETING.
7.2 STRIPPING TIMES OF THE FORM WORK SHALL BE AS SPECIFIED IN SABS 1200 G TABLE 2 OR AS PER THE ENGINEERS SITE INSTRUCTIONS.

8. GENERAL

8.1 WATERTIGHTNESS TEST IS TO BE CONDUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
8.2 NO STRUCTURAL ALTERATIONS MAY BE MADE WITHOUT THE APPROVAL OF THE ENGINEER.
8.3 THE POSITION OF THE CONSTRUCTION JOINTS IS TO BE DISCUSSED AND AGREED WITH THE ENGINEER PRIOR TO COMMENCEMENT OF ANY POUR.
8.4 PREPARATION OF CONSTRUCTION JOINTS; BEFORE COMMENCEMENT OF THE ADJACENT POUR, THE SURFACE OF THE PREVIOUS SECTION MUST BE CLEANED, AND SURFACE LAITANCE REMOVED, EITHER BY MEANS OF WIRE BRUSHING OR HACKING WITH A SCALING HAMMER. THE SURFACE MUST THEN BE THOROUGHLY WETTED AND SLUSHED WITH A 1:1.5 SAND OR CEMENT SLURRY, WITH PLACING OF NEW CONCRETE TO FOLLOW IMMEDIATELY.
8.5 ALL CONCRETE EDGES TO BE FINISHED WITH 20mm CHAMFERS.
8.6 NO CONCRETE IS TO BE CAST UNTIL STEEL FIXING HAS BEEN APPROVED BY THE ENGINEER.

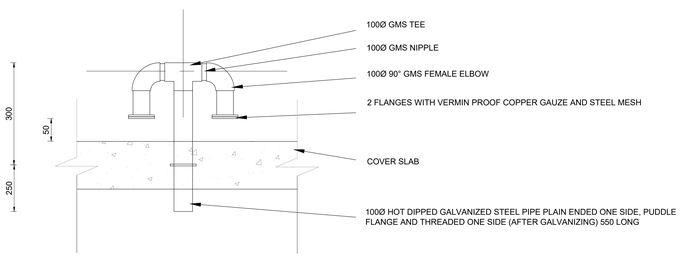


SECTION B-B
SCALE 1:50



SECTION A-A
SCALE 1:50

Ø500mm PIPE FITTING SCHEDULE						
ITEM NO.	NO. OFF	DESCRIPTION	SKETCH	MATERIAL	STEEL GRADE	FLANGE DRILLING
1	2	Ø300mm STEEL PIPE, x 1115mm FLANGED BOTH ENDS	1115	EPOXY COATED STEEL	ERW API SL X42 (4.5= t)(PN 25)	TABLE 25
2	1	Ø300mm x Ø 300mm TEE, 610mm x 305mm LONG FLANGED ONE ENDS	305 610	EPOXY COATED STEEL	ERW API SL X42 (4.5= t)(PN 25)	
3	1	Ø300 mm FLANGED REDUCER, FLANGED BOTH ENDS		EPOXY COATED STEEL	ERW API SL X42 (4.5= t)(PN 25)	
4	1	Ø100 mm FLANGED STAINLESS STEEL 315 BALL VALVE		STANDARD ITEM	PN 25	
5	1	Ø100 mm AIR VALVE FLANGED BOTH ENDS TRIPPLE ACTING (NON SLAM) TYPE		STANDARD ITEM	PN 25	



VENTILATOR
SCALE 1:20

No	DATE	REVISION	CONSULT	DIR
A	10/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	J.M
CHECKED BY	A.C
DRAWN BY	T.M
CHECKED BY	F.M
SIGNATURE	.....

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PROJECT NAME
GROBLERSDAL LUCKAU BWS-PHASE 1

DRAWING TITLE
AIR VALVE (300MM) CHAMBER DETAIL

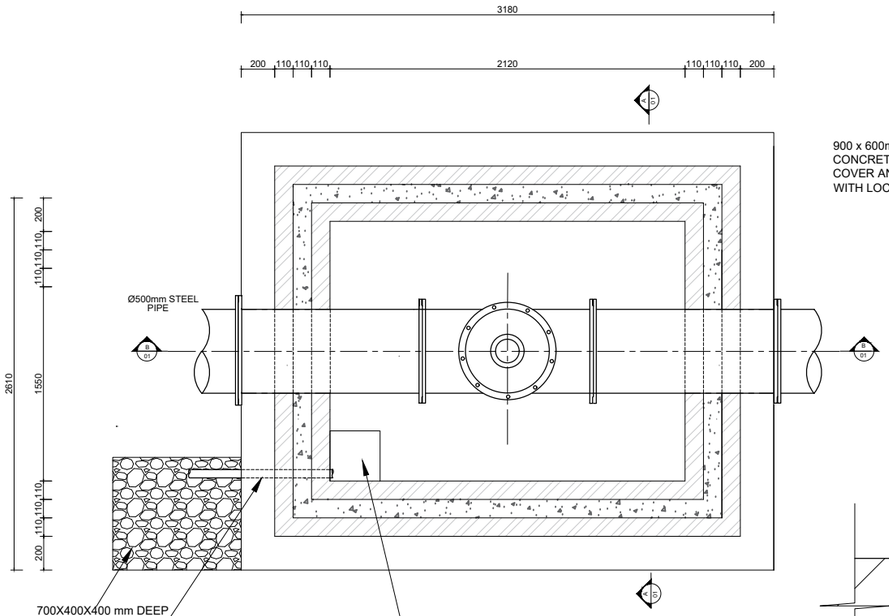
DRAWING No.
17005/04/10

CONTRACT No.
TBA

SCALE
AS SHOWN

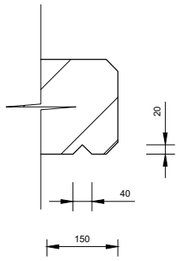
REVISION No.
A

SHEET No.
2 OF 2



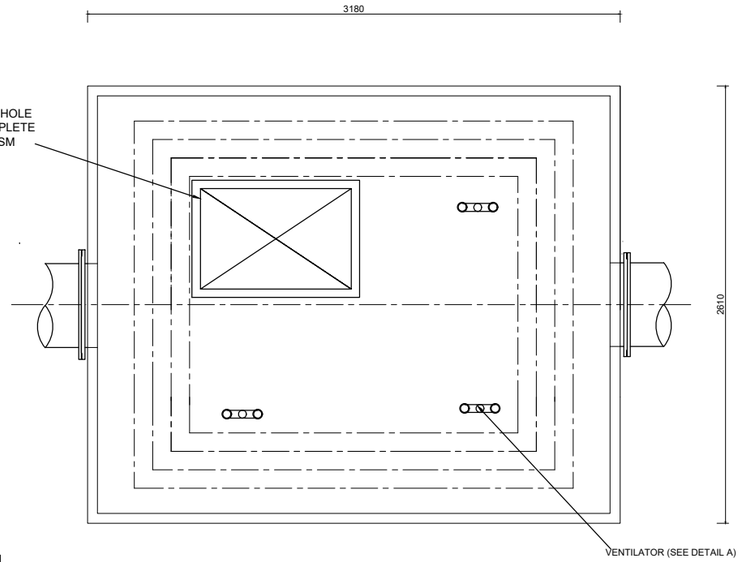
AIR VALVE CHAMBER PLAN

SCALE 1:50



DETAIL 01

SCALE 1:20



ROOF SLAB DETAIL

SCALE 1:50

NOTES

ALL REINFORCED CONCRETE WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH SABS 1200G AND AND PSG IN THE CONTRACT DOCUMENT AND AS MAY BE AMENDED OR ADDED THEREAFTER.

1. DATUM AS PER GENERAL LAYOUT PLAN.
2. UNLESS OTHERWISE STATED ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS IN METERS.
3. NO SCALING OF DIMENSIONS IS PERMITTED. ALL DIMENSIONS ARE TO BE CHECKED AND ANY DISCREPANCIES REPORTED TO THE ENGINEER IMMEDIATELY.

4. FOUNDATION

4.1 DEPTHS OF ALL BASES SHALL BE SHOWN ON THE DRAWINGS AND BE FINALLY APPROVED ON SITE BY THE ENGINEER PRIOR TO PLACING OF REINFORCEMENT OR CONCRETE.
4.2 ALL BASES SHALL BE CAST ON A MINIMUM LAYER OF 50mm BLINDING.
4.3 BLINDING LAYERS SHALL NOT EXCEED 250mm IN THICKNESS.

5. CONCRETE

5.1 CONCRETE TO BE MINIMUM STRENGTH MIX DESIGN OF:
5.1.1 CLASS 15/19 IN BLINDING LAYERS;
5.1.2 CLASS 25/19 IN WALL FOUNDATIONS, FLOOR AND ROOF SLABS, AND;
5.1.3 CLASS 25/19 IN RESERVOIR WALL, UNLESS OTHERWISE STATED.

5.2 MINIMUM COVER TO REINFORCEMENT INCLUDING LINKS SHALL BE:
5.2.1 50mm FOR FOUNDATION SLABS AND FOOTINGS;
5.2.2 50mm FOR WALLS AND COLUMNS, AND;
5.2.3 30mm FOR ROOF SLABS ON CHAMBERS, UNLESS OTHERWISE INDICATED.

6. REINFORCING

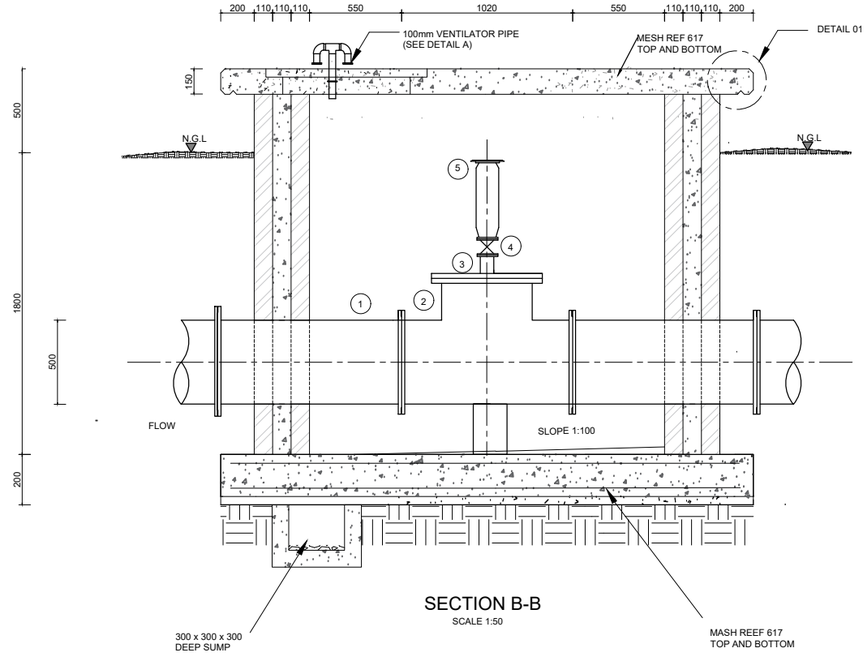
6.1 ALL REINFORCING STEEL SHALL BE WIRE BRUSHED AND KEPT CLEAN AND FREE OF ANY MILL SCALE, RUST, OIL OR ANY OTHER DELETERIOUS COMPOUNDS.
6.2 WELDING ON REINFORCEMENT STEEL WILL NOT BE PERMITTED.
6.3 ALL REINFORCING STEEL FIXED IN POSITION ON SITE SHALL BE CHECKED BY THE ENGINEER PRIOR TO CONCRETING.

7 FORM WORK

7.1 FORM WORK SHALL BE ERECTED AND FIXED IN AN APPROVED MANNER AND SHALL BE INSPECTED BY THE ENGINEER PRIOR TO CONCRETING.
7.2 STRIPPING TIMES OF THE FORM WORK SHALL BE AS SPECIFIED IN SABS 1200 G TABLE 2 OR AS PER THE ENGINEERS SITE INSTRUCTIONS.

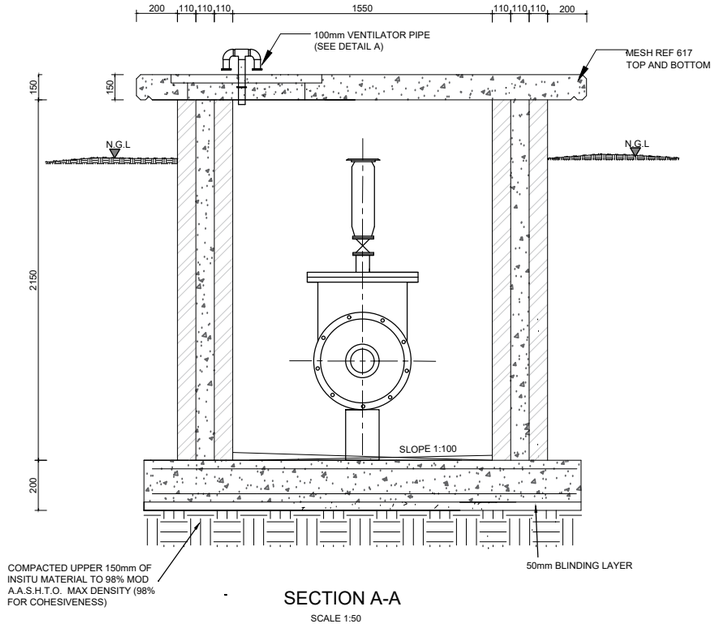
8. GENERAL

8.1 WATERTIGHTNESS TEST IS TO BE CONDUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
8.2 NO STRUCTURAL ALTERATIONS MAY BE MADE WITHOUT THE APPROVAL OF THE ENGINEER.
8.3 THE POSITION OF THE CONSTRUCTION JOINTS IS TO BE DISCUSSED AND AGREED WITH THE ENGINEER PRIOR TO COMMENCEMENT OF ANY POUR.
8.4 PREPARATION OF CONSTRUCTION JOINTS; BEFORE COMMENCEMENT OF THE ADJACENT POUR, THE SURFACE OF THE PREVIOUS SECTION MUST BE CLEANED, AND SURFACE LAITANCE REMOVED, EITHER BY MEANS OF WIRE BRUSHING OR HACKING WITH A SCALING HAMMER. THE SURFACE MUST THEN BE THOROUGHLY WETTED AND SLUSHED WITH A 1:1.5 SAND OR CEMENT SLURRY, WITH PLACING OF NEW CONCRETE TO FOLLOW IMMEDIATELY.
8.5 ALL CONCRETE EDGES TO BE FINISHED WITH 20mm CHAMFERS.
8.6 NO CONCRETE IS TO BE CAST UNTIL STEEL FIXING HAS BEEN APPROVED BY THE ENGINEER.



SECTION B-B

SCALE 1:50

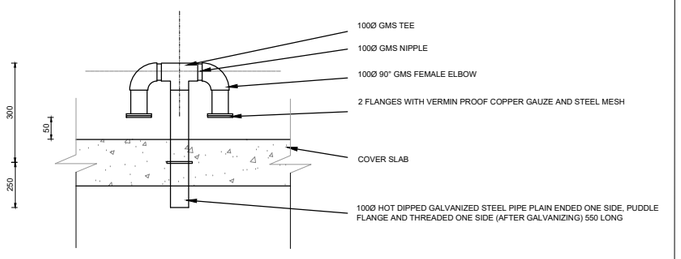


SECTION A-A

SCALE 1:50

Ø500mm PIPE FITTING SCHEDULE

ITEM NO.	NO. OFF	DESCRIPTION	SKETCH	MATERIAL	STEEL GRADE	FLANGE DRILLING
1	2	Ø500mm STEEL PIPE, x 1115mm FLANGED BOTH ENDS	1115	EPOXY COATED STEEL	ERW API SL X42 (6= t)(PN 25)	TABLE 25
2	1	Ø500mm x Ø 500mm TEE, 1020mm x 510mm LONG FLANGED ONE ENDS	510 1020	EPOXY COATED STEEL	ERW API SL X42 (6= t)(PN 25)	
3	1	Ø500 mm FLANGED REDUCER, FLANGED BOTH ENDS		EPOXY COATED STEEL	ERW API SL X42 (6= t)(PN 25)	
4	1	Ø100 mm FLANGED STAINLESS STEEL 315 BALL VALVE		STANDARD ITEM	PN 25	
5	1	Ø100 mm AIR VALVE FLANGED BOTH ENDS TRIPPLE ACTING (NON SLAM) TYPE		STANDARD ITEM	PN 25	



VENTILATOR (3 OF)

SCALE 1:20

No	DATE	REVISION	CONSULT	DIR
A	10/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	J.M
CHECKED BY	A.C
DRAWN BY	T.M
CHECKED BY	F.M
SIGNATURE	.....

CLIENT

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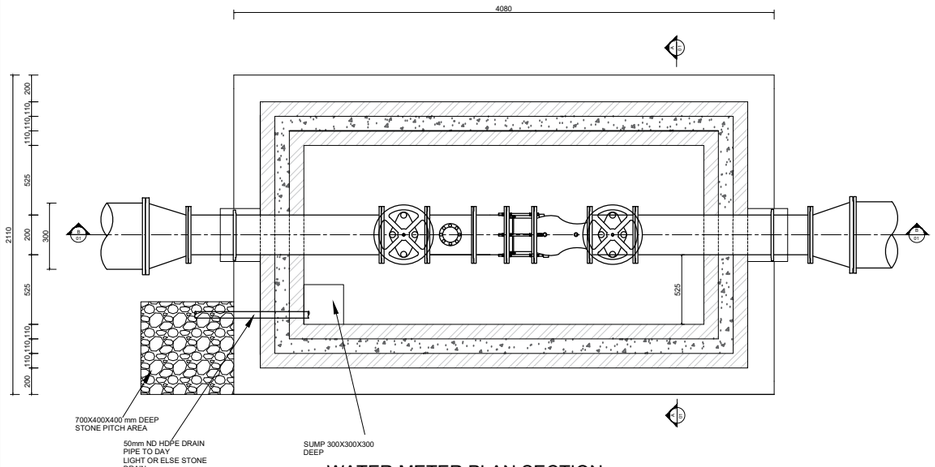
PROJECT NAME

GROBLERSDAL LUCKAU BWS-PHASE 1

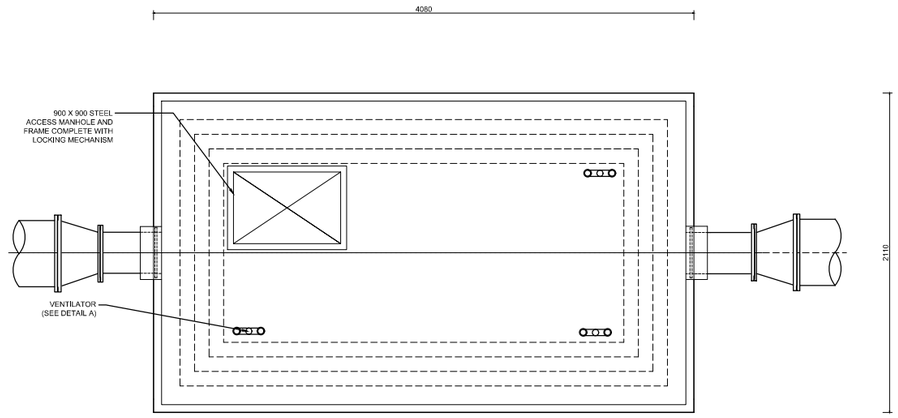
DRAWING TITLE

AIR VALVE (500MM) CHAMBER DETAIL

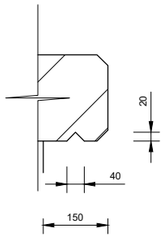
DRAWING No.	17005/04/12
REVISION No.	A
CONTRACT No.	TBA
SCALE	AS SHOWN
SHEET No.	1 OF 3



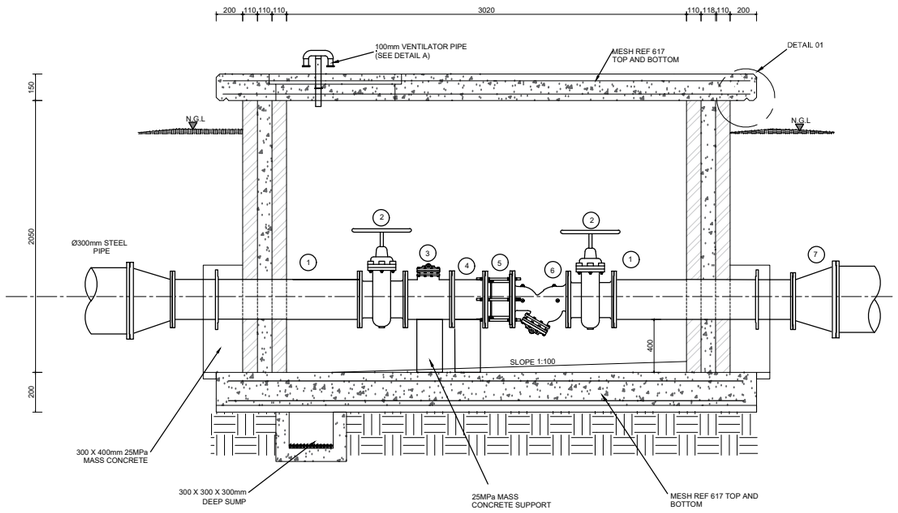
WATER METER PLAN SECTION
SCALE 1:50



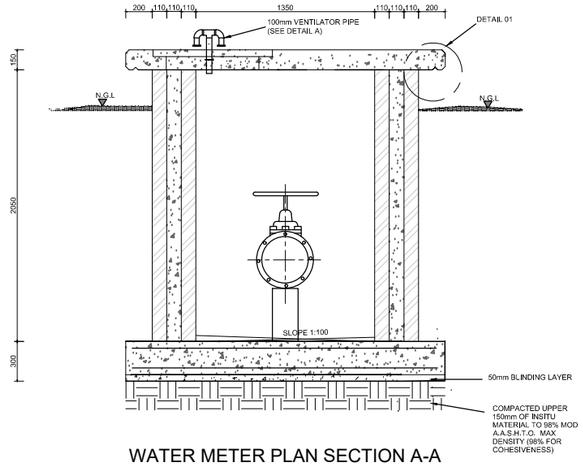
WATER METER ROOF PLAN
SCALE 1:50



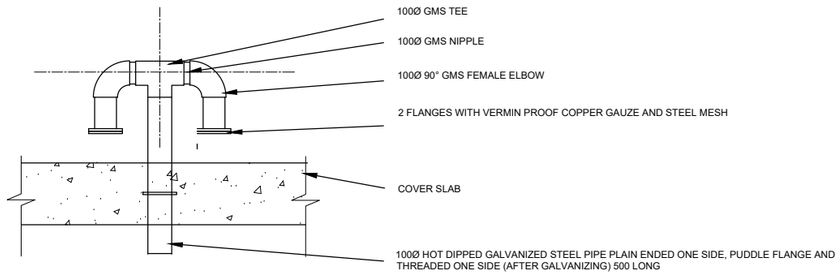
DETAIL 01
SCALE 1:20



WATER METER PLAN SECTION B-B
SCALE 1:50



WATER METER PLAN SECTION A-A
SCALE 1:50



DETAIL A VENTILATOR(3 0F)
(DETAIL A)
SCALE 1:20

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4.3 BLINDING LAYERS SHALL NOT EXCEED 250mm IN THICKNESS.

5. CONCRETE

5.1 CONCRETE TO BE MINIMUM STRENGTH MIX DESIGN OF:

5.1.1 CLASS 15/19 IN BLINDING LAYERS;

5.1.2 CLASS 30/19 IN WALL FOUNDATIONS, FLOOR AND ROOF SLABS, AND;

5.1.3 CLASS 30/19 IN RESERVOIR WALL, UNLESS OTHERWISE STATED.

5.2 MINIMUM COVER TO REINFORCEMENT INCLUDING LINKS SHALL BE:

5.2.1 50mm FOR FOUNDATION SLABS AND FOOTINGS;

5.2.2 50mm FOR WALLS AND COLUMNS, AND;

5.2.3 30mm FOR ROOF SLABS ON CHAMBERS, UNLESS OTHERWISE INDICATED.

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8.5 ALL CONCRETE EDGES TO BE FINISHED WITH 20mm CHAMFERS.

8.6 NO CONCRETE IS TO BE CAST UNTIL STEEL FIXING HAS BEEN APPROVED BY THE ENGINEER.

Ø300mm PIPE FITTING SCHEDULE

ITEM NO.	NO. OFF	DESCRIPTION	SKETCH	MATERIAL	STEEL GRADE	FLANGE DRILLING
1	2	Ø350mm STEEL PIPE, x 1330mm LONG WITH PUDDLE FLANGE, FLANGED BOTH ENDS	350 1080	EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	TABLE 25
2	2	Ø200mm GATE VALVE FLANGED BOTH ENDS		STANDARD ITEM	PN 25	
3	1	Ø200mm FLOW METER FLANGED BOTH ENDS		STANDARD ITEM	PN 25	
4	1	Ø200mm STEEL PIPE, x 1080mm LONG FLANGED BOTH ENDS		EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	
5	1	Ø200mm VJ COUPLING		STANDARD ITEM	PN 25	
6	1	Ø200mm STRAINER FLANGED BOTH ENDS		STANDARD ITEM	PN 25	
7	2	Ø300mm TO Ø200mm REDUCER FLANGED BOTH ENDS		EPOXY COATED STEEL	GRADE B STEEL PIPE (4.5mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	

No	DATE	REVISION	CONSULT	DIR
A	10/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	J.M
CHECKED BY	A.C
DRAWN BY	T.M
CHECKED BY	F.M
SIGNATURE	.....

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CONSULTANT
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EMAIL: admin@hwaeng.co.za

PROJECT NAME
UPGRADING OF GROBLERSDAL-LAKAU BULK WATER SUPPLY SCHEME

DRAWING TITLE
FLOW METER CHAMBER DETAILS

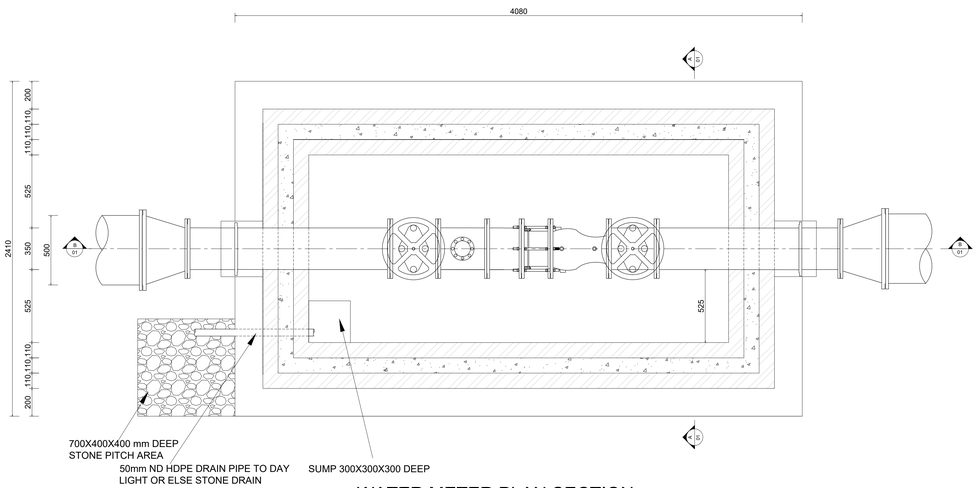
DRAWING No.
17005/04/13

CONTRACT No.

SCALE
AS SHOWN

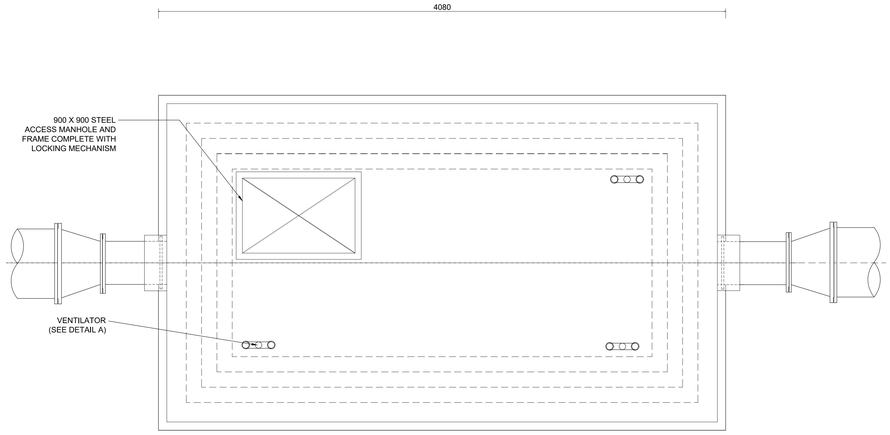
REVISION No.
A

SHEET No.
SHEET 2 OF 2



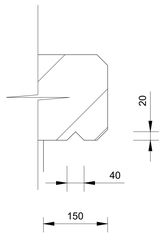
WATER METER PLAN SECTION

SCALE 1:50



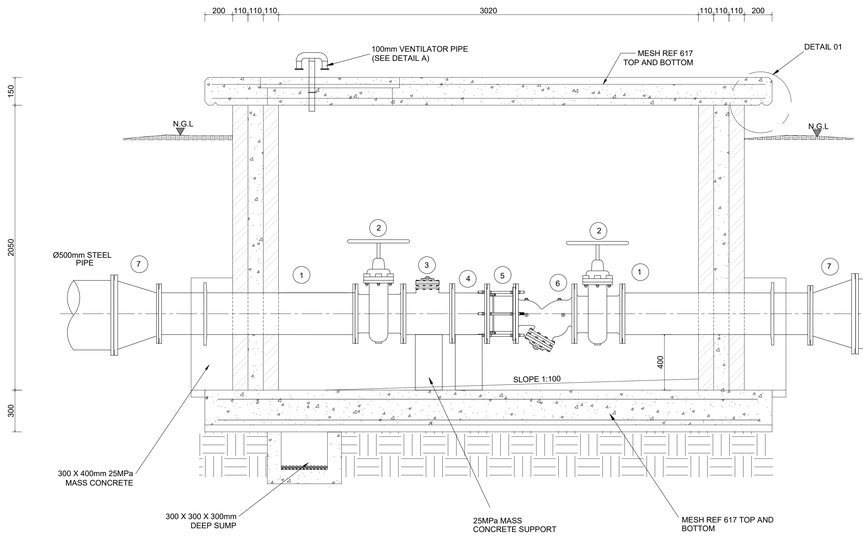
WATER METER ROOF PLAN

SCALE 1:50



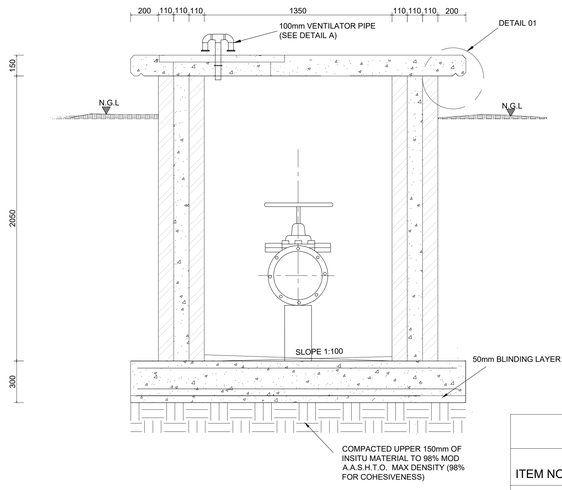
DETAIL 01

SCALE 1:20



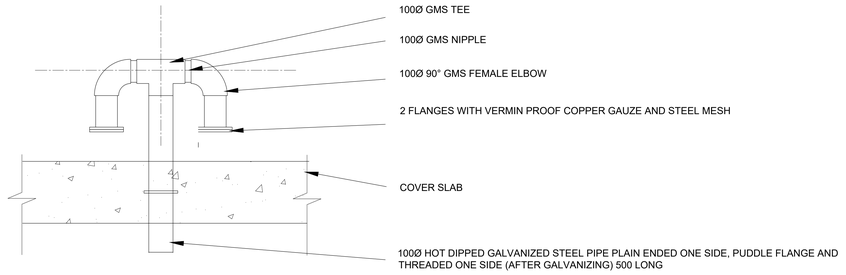
WATER METER PLAN SECTION B-B

SCALE 1:50



WATER METER PLAN SECTION A-A

SCALE 1:50



DETAIL A VENTILATOR(3 OF)

SCALE 1:20

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8.5 ALL CONCRETE EDGES TO BE FINISHED WITH 20mm CHAMFERS.

8.6 NO CONCRETE IS TO BE CAST UNTIL STEEL FIXING HAS BEEN APPROVED BY THE ENGINEER.

Ø300mm PIPE FITTING SCHEDULE

ITEM NO.	NO. OFF	DESCRIPTION	SKETCH	MATERIAL	STEEL GRADE	FLANGE DRILLING
1	2	Ø350mm STEEL PIPE, x 1330mm LONG WITH PUDDLE FLANGE, FLANGED BOTH ENDS	350 1080	EPOXY COATED STEEL	GRADE B STEEL PIPE (6mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	TABLE 25
2	2	Ø350mm GATE VALVE FLANGED BOTH ENDS		STANDARD ITEM	PN 25	
3	1	Ø350mm FLOW METER FLANGED BOTH ENDS		STANDARD ITEM	PN 25	
4	1	Ø350mm STEEL PIPE, x 1080mm LONG FLANGED BOTH ENDS		EPOXY COATED STEEL	GRADE B STEEL PIPE (6mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	
5	1	Ø350mm VJ COUPLING		STANDARD ITEM	PN 25	
6	1	Ø350mm STRAINER FLANGED BOTH ENDS		STANDARD ITEM	PN 25	
7	2	Ø500mm TO Ø350mm REDUCER FLANGED BOTH ENDS		EPOXY COATED STEEL	GRADE B STEEL PIPE (6mm THICKNESS) EPOXY COATING FOR CORROSION PROTECTION TO SANS 1123	

No	DATE	REVISION	CONSULT	DIR
A	10/2022	FOR TENDER	J.M	

NOTES

STAMP

DESIGNED BY	J.M
CHECKED BY	A.C
DRAWN BY	T.M
CHECKED BY	F.M
SIGNATURE	.....

CLIENT

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CONSULTANT

HWA Engineers & Project Managers

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FAX: 086 246 0744
EMAIL: admin@hwaeng.co.za

PROJECT NAME

UPGRADING OF GROBLERSDAL-LAKAU BULK WATER SUPPLY SCHEME

DRAWING TITLE

FLOW METER CHAMBER DETAILS

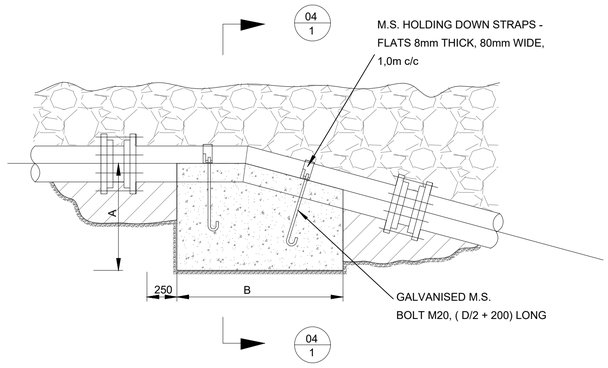
DRAWING No.
17005/04/11

CONTRACT No.

SCALE
AS SHOWN

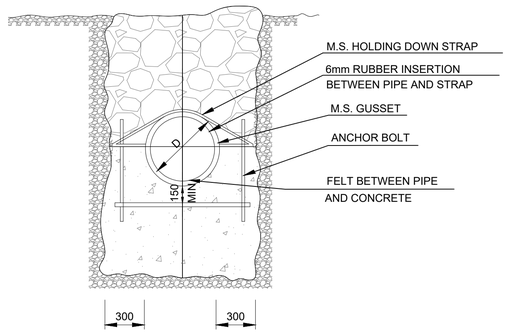
REVISION No.
A

SHEET No.
SHEET 1 OF 1



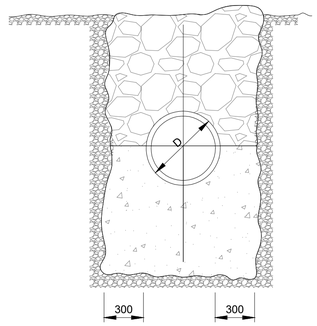
VIEW
VERTICAL UPTHRUST ANCHOR BLOCK

SCALE 1 : 20



SECTION 07-07

SCALE 1 : 20



SECTION 04-04

SCALE 1 : 20

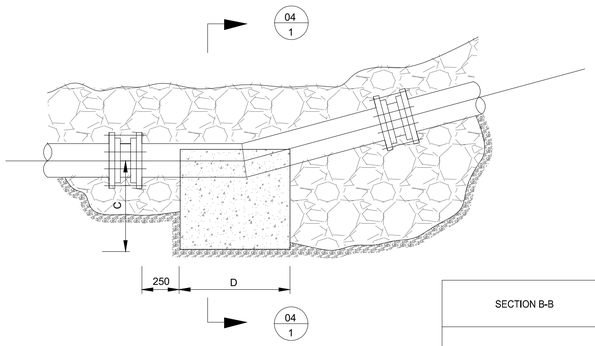
NOTES:

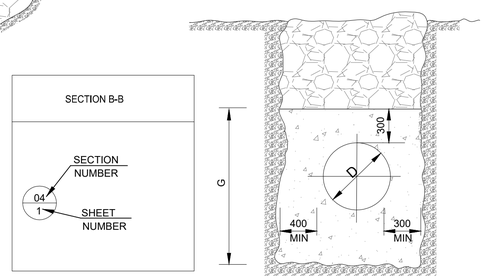
1. CORROSION PROTECTION OF M.S. ITEMS IN ANCHOR BLOCKS

   1.1 AT FACTORY AFTER MANUFACTURING:
   1.1.1. SHOT BLAST
   1.1.2. PAINT WITH 3 COATS OF BITUMEN PRIMER

   1.2. ON SITE FTER INSTALLATION.
   COAT WITH HOT APPLIED BITUMEN TO A THICKNESS NOT LESS THAN 3mm AT ANY POINT.

2. CUT-OFF WALLS TO BE AT LEAST 500mm WHERE PRACTICAL OR ON TO ROCK. WHICHEVER IS THE SHALLOWER.
3. REINFORCEMENT MESH REF. No. 617 TO S.A.B.S 1024.
4. CONCRETE CLASS 30/20
5. NUMBER OF MIDDLE PANELS TO BE DETERMINED ON SITE (DEPENDS ON LENGTH OF CROSSING).
6. MIN. COVER = 50mm OVER REINFORCEMENT.
7. GABIONS SHALL BE MADE OF HEXAGONAL WOVEN, TRIPLE TWISTED MESH,GALVANISED TO S.A.BS. 675 CLASS A BEFORE WEAVING.
8. GABIONS SIZES SHALL BE 2 x 1 x 0,3m HIGH, MESH SIZE SHALL BE 50 x 70 mm AND WIRE DIAMETER SHALL BE 2mm.
9. GABIONS SHALL BE FILLED WITH HARD DURABLE ROCK NOT LARGER THAN 200mm AND NOT SMALLER THAN SPECIFIED MESH SIZE.
10. THRUST ANCHOR BLOCKS TO BE DESIGNED ACCORDING TO DWS 1110 SPECIFICATION, CLAUSE 15.2.2. AND 15.2.4.



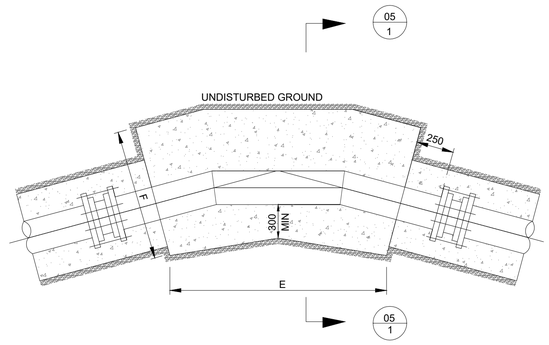


VIEW
VERTICAL DOWNTHRUST ANCHOR BLOCK

SCALE 1 : 20

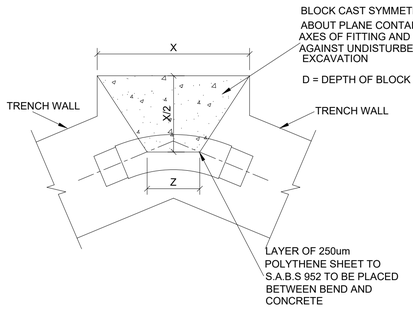
SECTION 05-05

SCALE 1 : 20



VIEW
HORIZONTAL THRUST ANCHOR BLOCK

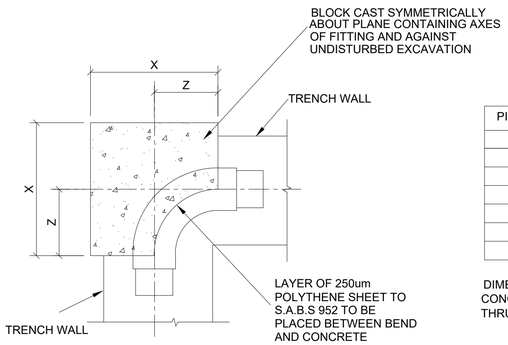
SCALE 1 : 20



PIPE DIA.	45° BEND			22.5° BEND			11.25° BEND		
	X	D	Z	X	D	Z	X	D	Z
500	3600	900	1650	1960	900	900	1960	100	900
300	2000	700	850	1000	700	420	1000	700	420
250	1600	650	650	760	650	300	760	650	300
200	1200	600	500	600	600	250	600	600	250
150	1000	500	400	500	500	200	500	500	200
100	350	500	150	300	400	130	300	400	130
75	350	400	150	300	300	130	300	300	130

DIMENSIONS IN MILLIMETRES
CONCRETE 20Mpa/19mm
THRUST BLOCK IN PRESSURE PIPELINE FOR 45°, 22.5° AND 11.25° BEND

SCALE 1 : 60



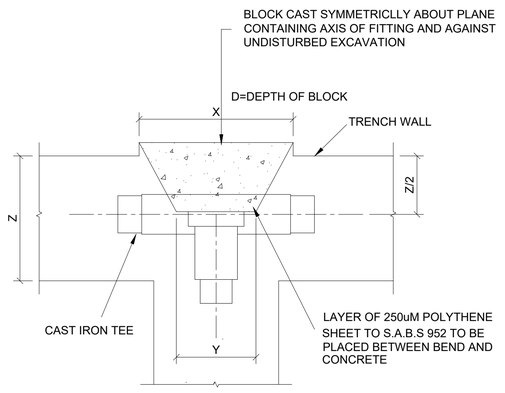
PIPE DIA.	X	D	Z
500	4900	900	2600
300	2700	700	1400
250	2150	650	1100
200	1600	600	800
150	1300	500	700
100	500	500	300
75	450	400	300

DIMENSIONS IN MILLIMETRES
CONCRETE 20Mpa/19mm
THRUST BLOCK IN PRESSURE PIPELINE FOR 90° BEND

NOTE :

COUPLINGS AND FLANGES SHALL BE LEFT CLEAR OF CONCRETE

SCALE 1 : 60



PIPE DIA.	X	D	Z	Y
500	4900	900	2100	4000
300	2700	700	1300	2000
250	2150	650	1100	1500
200	1600	600	800	1100
150	1300	500	650	900
100	500	500	300	300
75	450	400	300	250

DIMENSIONS IN MILLIMETRES
CONCRETE 20Mpa/19mm
THRUST BLOCK IN PRESSURE PIPELINE FOR TEE AND END CAP

SCALE 1 : 60

No	DATE	REVISION	CONSULT	DIR
A	11/2022	FOR TENDER	F.M	

NOTES

DESIGNED BY	F.M
CHECKED BY	A.C
DRAWN BY	M.N
CHECKED BY	J.M
APPROVED BY	ALEX CHIUSWA
CHECKED BY	.....

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PROJECT NAME

GROBLERSDAL LUCKAU WATER SUPPLY

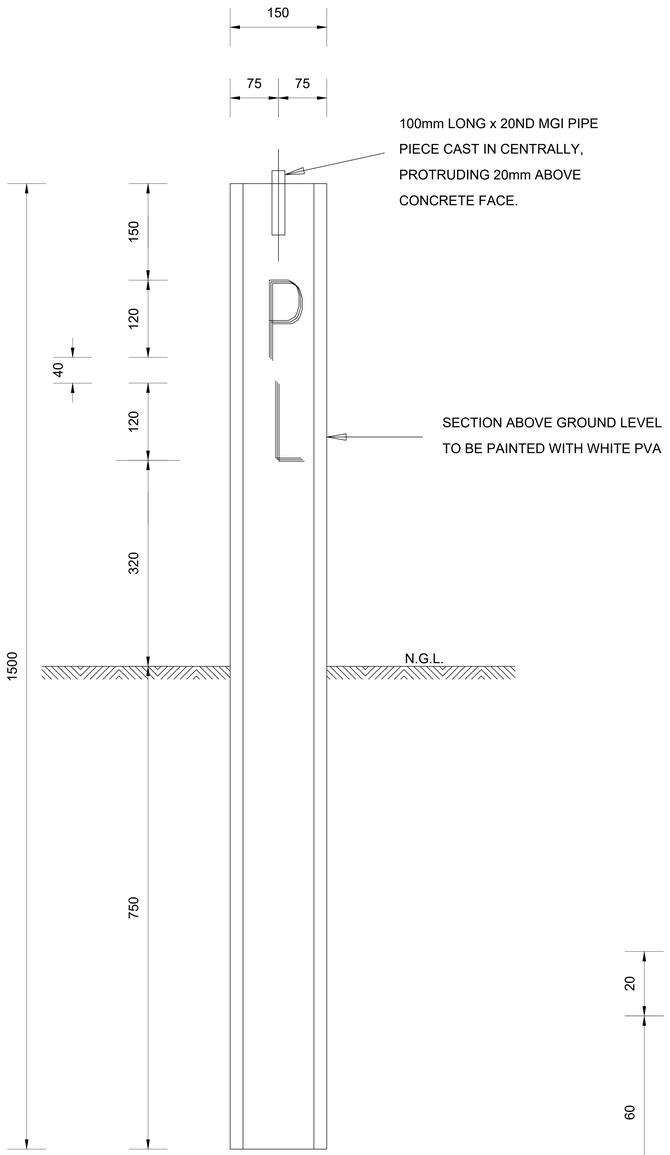
DRAWING TITLE

THRUST BLOCK DETAILS

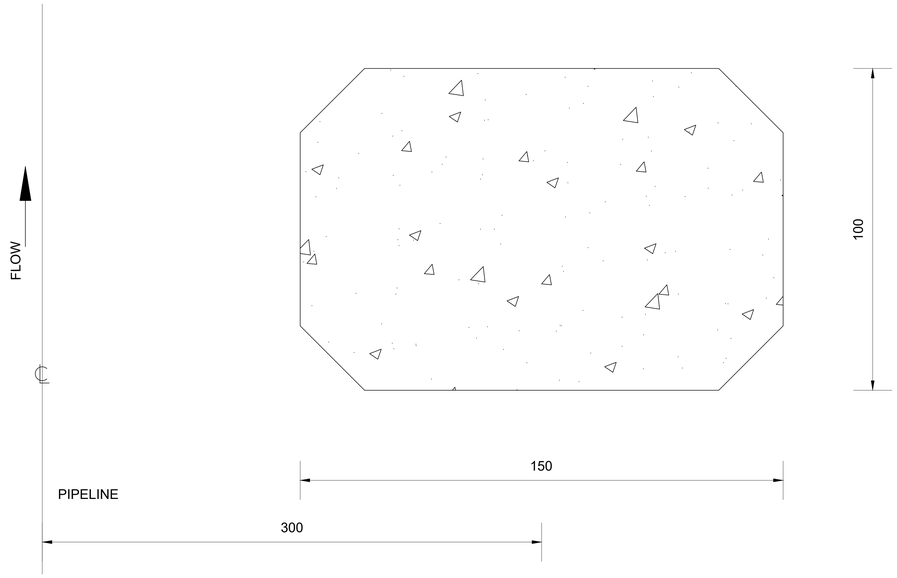
DRAWING No.	17005/04/12
CONTRACT No.	
SCALE	NTS
REVISION No.	A
SHEET No.	SHEET 1 OF 1

PIPELINE MARKER NOTES

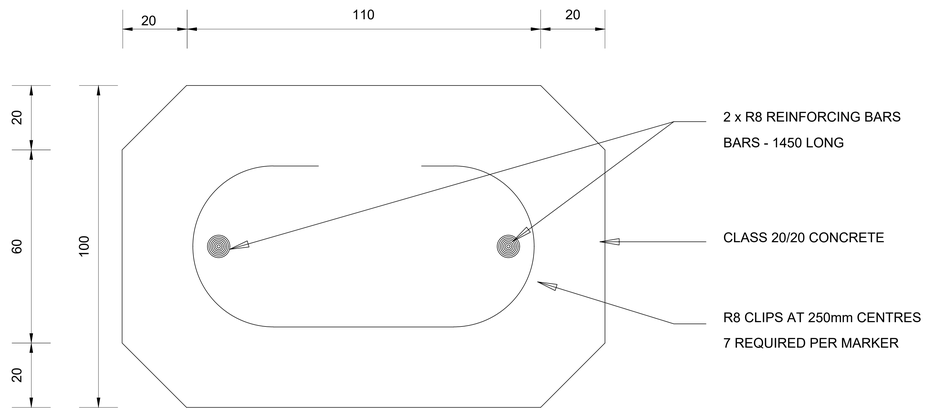
1. MARKER POSTS TO BE PLACED EVERY 200M ALONG THE PIPELINE ROUTE.
2. MARKER POSTS TO BE PLACED ON EVERY BEND ALONG THE PIPE PARALLEL TO A TARRED ROAD



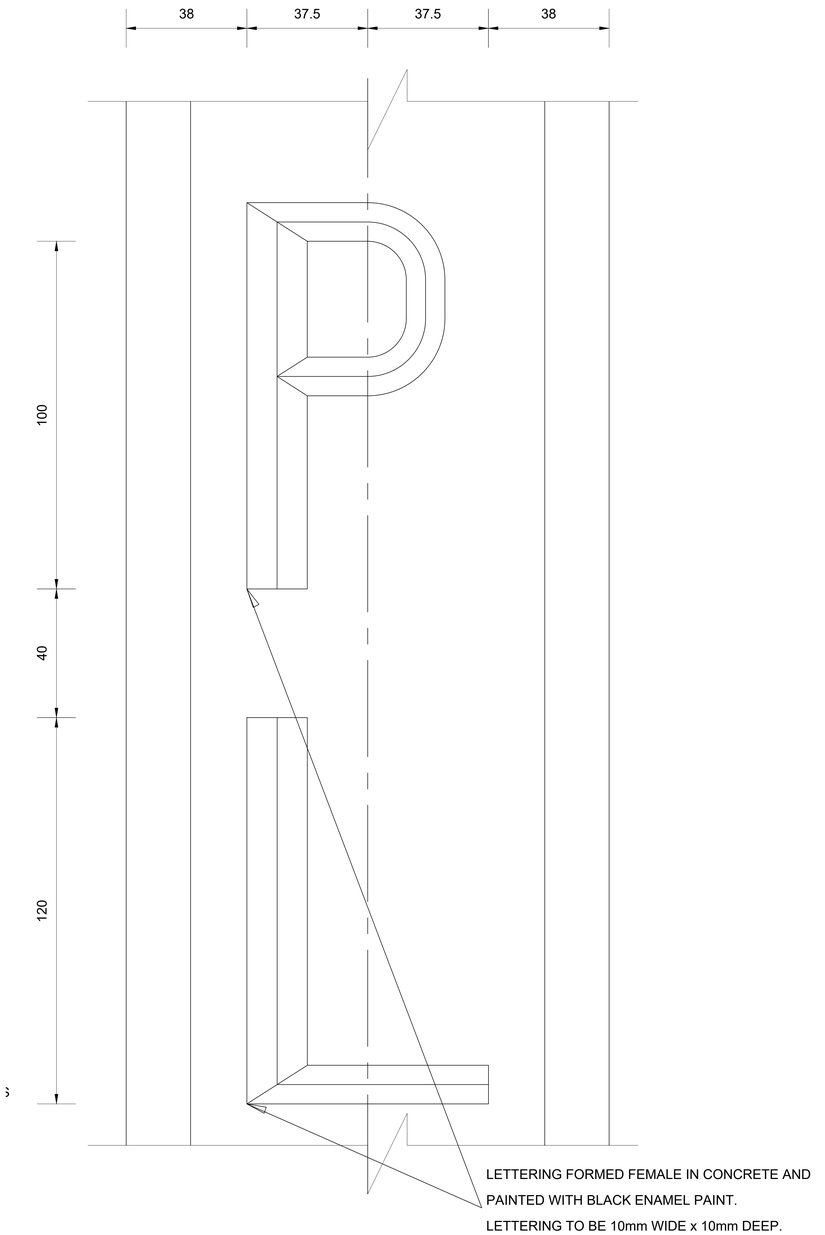
ELEVATION
SCALE 1:20



PLAN
SCALE 1:5



REINFORCEMENT DETAIL
SCALE 1:5



LETTERING DETAILS
SCALE 1:5

No	DATE	REVISION	CONSULT	DIR
A	11/2022	FOR TENDER	F.M	

NOTES

STAMP

DESIGNED BY	F.M
CHECKED BY	A.C
DRAWN BY	O.S
CHECKED BY	J.M
APPROVED BY	ALEX CHIUSWA
SIGNATURE	.....

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PROJECT NAME
GROBLERSDAL LUCKAU BWS

DRAWING TITLE
PIPE MARKERS DETAIL

DRAWING No.
17005/04/13

CONTRACT No.
TBA

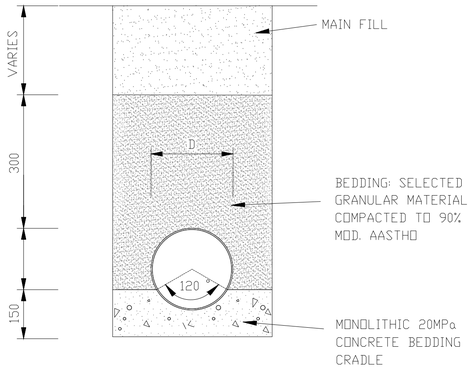
SCALE
AS SHOWN

REVISION No.
A

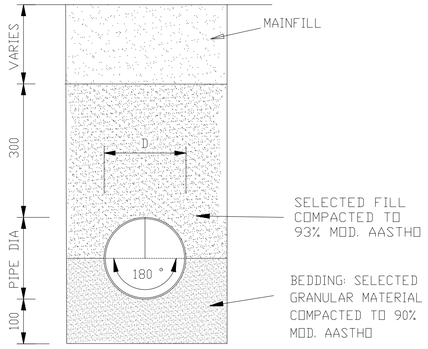
SHEET No.
1 OF 1

NOTE :
OUTSIDE BARREL DIMENSION = D

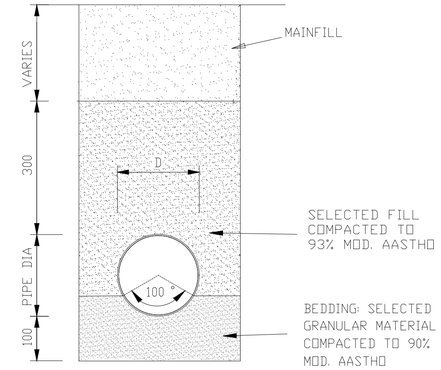
50mm ON ORIGINAL SCALE



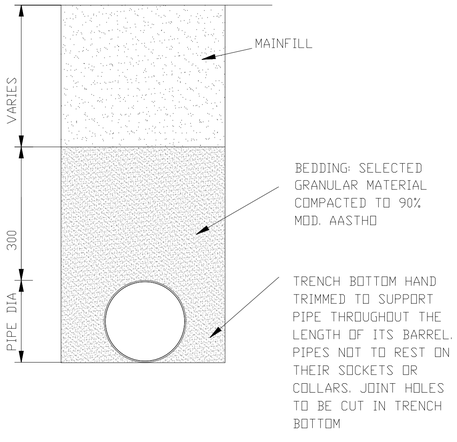
a) RIGID PIPE ON CLASS 'A' BED



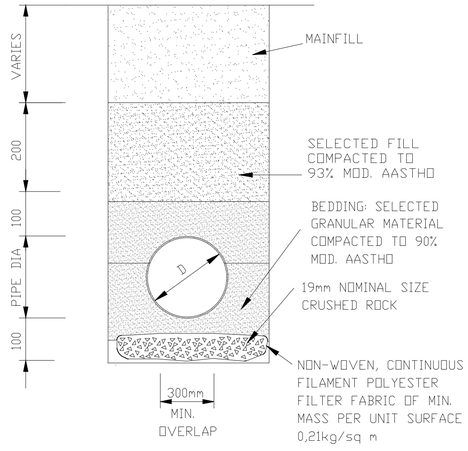
b) RIGID PIPE ON CLASS 'B' BED



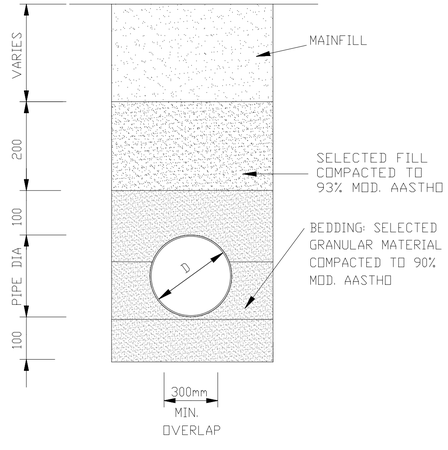
c) RIGID PIPE ON CLASS 'C' BED



d) RIGID PIPE ON CLASS 'D' BED



e) TRENCH SUBSURFACE DRAIN



f) FLEXIBLE PIPES BEDDING

No	DATE	REVISION	CONSULT	DIR
	11/2022	FOR TENDER	AC	

NOTES

DESIGNED BY	K.M
CHECKED BY	A.C
DRAWN BY	T.M
CHECKED BY	A.C

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PROJECT NAME
GROBLERSDAL LUCKAU BWS

DRAWING TITLE
PIPE BEDDING

DRAWING No.
17005/04/14

CONTRACT No.

SCALE
NTS

REVISION No.

SHEET No.
SHEET 1 OF 1