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MPUMALANGA PROVINCIAL GOVERNMENT



**DEPARTMENT OF CO-OPERATIVE GOVERNANCE,
HUMAN SETTLEMENTS & TRADITIONAL AFFAIRS**

BID NUMBER: COGHSTA/020 /26/MP

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 AND 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE

ISSUED BY:

Department of Co-operative Governance, Human Settlements & Traditional Affairs
Private Bag X11328
Mbombela
1200

NAME OF BIDDER:
TOTAL BID PRICE (all inclusive) :
(Also in words):
.....

PART A INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE DEPARTMENT OF CO-OPERATIVE GOVERNANCE, HUMAN SETTLEMENTS & TRADITIONAL AFFAIRS					
BID NUMBER:	COGHSTA/020/26/MP	CLOSING DATE:	07 April 2026	CLOSING TIME:	12H00
DESCRIPTION	APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 AND 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE				
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT (STREET ADDRESS)					
MBOMBELA , Riverside Government Complex, Building No 9, Government Boulevard, Mbombela, 1200, PIET RETIEF , No. 11 Measroch Street, Piet Retief Office, KWAMHLANGA , KwaMhlanga Government Complex, Department of Finance, Building No. 12, Computer Centre SECUNDA No 5 Van Eck Street, Secunda (opposite Sasol Value Gas Garage) Secunda, 2280, BUSHBUCKRIDGE , Bushbuckridge Advice Centre, Department of Finance, Protea building (old Telkom building), MIDDELBURG , Department of Public Works, Cnr. Lillian Ngoyi and Dr Beyers Naudé Streets – Old TPA Building, Upper ground floor, Office numbers A20, 21 and 25, MALELANE , 24 Air Street, Malelane, ELUKWATINI , Elukwatini Sub Regional offices, Office numbers A49 and A50 (opposite Elukwatini Community Hall) Stand number 12 Extension A, Elukwatini 1192. SIYABUSWA Old Parliament Building, Building No.1, Job Skhosana Street, Siyabuswa 0472					
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO			TECHNICAL ENQUIRIES MAY BE DIRECTED TO:		
CONTACT PERSON	Mr. R.S Motsilanyana		CONTACT PERSON	Mr P.G Mpofo	
TELEPHONE NUMBER	013 766 6426		TELEPHONE NUMBER	013 766 6315	
FACSIMILE NUMBER			FACSIMILE NUMBER		
E-MAIL ADDRESS	rsmotsilanyana@mpg.gov.za		E-MAIL ADDRESS	pgmpofu@mpg.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
ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES ENCLOSE PROOF]		ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES, ANSWER THE QUESTIONNAIRE BELOW]	
QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS					
IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?				<input type="checkbox"/> YES <input type="checkbox"/> NO	
DOES THE ENTITY HAVE A BRANCH IN THE RSA?				<input type="checkbox"/> YES <input type="checkbox"/> NO	
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?				<input type="checkbox"/> YES <input type="checkbox"/> NO	
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?				<input type="checkbox"/> YES <input type="checkbox"/> NO	
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?				<input type="checkbox"/> YES <input type="checkbox"/> NO	
IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 BELOW.					

**PART B
TERMS AND CONDITIONS FOR BIDDING**

1. BID SUBMISSION:	
1.1.	BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
1.2.	ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED (NOT TO BE RE-TYPED) OR IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.
1.3.	THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, THE GENERAL CONDITIONS OF CONTRACT (GCC) 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 (SBD7).
2. TAX COMPLIANCE REQUIREMENTS	
2.1	BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
2.2	BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.
2.3	APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.
2.4	BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
2.5	IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED; EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
2.6	WHERE NO TCS PIN IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.
2.7	NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE."

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

SIGNATURE OF BIDDER:

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

DATE:

MPUMALANGA PROVINCIAL GOVERNMENT



CO-OPERATIVE GOVERNANCE, HUMAN SETTLEMENTS AND TRADITIONAL AFFAIRS

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 AND 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE

TENDER NUMBER: COGHSTA/020/26/MP.

CONTRACT DURATION: 36 MONTHS

EMPLOYER:



HEAD OF DEPARTMENT

Department. of Cooperate Governance, Human Settlements and Tadtional Affairs
Private Bag X11328
Nelspruit,1200
Phone: 013 766 6315
Contact: Mr P.G Mpfu
E-mail: pgmpofu@mpg.gov.za

ENGINEER:



PEROZZ CONSULTING ENGINEERS
14 Lost Trail Street
Nelspruit
1200
Telephone No: 010 634 1462
Cell No: 073 185 6632
Contact: Mr S. Bizure
E-mail: perozzconsultant@gmail.com

MPUMALANGA PROVINCIAL GOVERNMENT



**CO-OPERATIVE GOVERNANCE, HUMAN SETTLEMENTS AND
TRADITIONAL AFFAIRS**

**APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK
INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 AND 3 UNDER NKOMAZI
LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE.**

NAME OF TENDERER : _____

ADDRESS : _____

TELEPHONE NUMBER : _____

FAX NUMBER : _____

E-MAIL ADDRESS : _____

CONTRACT PRICE : R _____

(Amount brought forward from the Form of Offer and Acceptance) *

Signed by authorised representative of the TENDERER: _____

DATE: _____

IMPORTANT INFORMATION

PLEASE READ CAREFULLY BEFORE COMPLETING DOCUMENT.

1. Notice to all tenderers.
2. Standards applied in this document.

NOTICE TO ALL TENDERERS

This is an original document:

1. It may not be re-typed or altered in any way.
2. It must be completed in black ink – in an eligible handwriting.
3. It may not be taken apart.
4. It is not available in electronic format except PDF.
5. It is compulsory to attach required documents to the relative page (where requested). Any other form of presentation (loose pages or separate documents) will not be accepted.

STANDARDS APPLICABLE TO THIS DOCUMENT

Available from the S.A. Federation of Civil Engineering Contractors, the S.A. Institution of Civil Engineering, and the S.A. Bureau of Standards, as applicable:

1. CIDB *CIDB Standard for uniformity in Construction Procurement, 10 July 2015, as amended.*
2. SANS 10845-1 *Processes, methods and procedures.*
3. SANS 10845-2 *Formatting and compilation of procurement documentation.*
4. SANS 10845-3 *Standard conditions of tender.*
6. "General Conditions of Contract for Construction Works, Third Edition (2015) issued by the South African institution of Civil Engineering.
7. SANS 1200 Standardized Specifications for Civil Engineering Construction
8. This Document, as presented.

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THE TENDER

SECTION DESCRIPTION

PART T1 TENDERING PROCEDURES

- T 1.1 Tender Notice and Invitation to Tender
- T 1.2 Tender Data

PART T2 RETURNABLE DOCUMENTS (See List of Documents)

THE CONTRACT

SECTION DESCRIPTION

PART C1 AGREEMENT and CONTRACT DATA

- C 1.1 Form of Offer
- C 1.2 Form of Acceptance
- C 1.3 Schedule of Deviations
- C 1.4 Contract Data
- C 1.5 Pro Forma Safety Agreement
- C 1.6 Pro Forma Declaration of Ownership of Unused Materials
- C 1.7 Pro Forma Monthly Labour Report
- C 1.8 Pro Forma Form of Guarantee

PART C2 PRICING DATA

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PART T1: TENDERING PROCEDURES

<u>SECTION</u>	<u>DESCRIPTION</u>
T 1.1	Tender Notice and Invitation to Tender
T 1.2	Tender Data

PART T2: RETURNABLE DOCUMENTS

<u>SECTION</u>	<u>DESCRIPTION</u>
T 2	Returnable Documents

T1.1: TENDER NOTICE AND INVITATION TO TENDER

T1.1: TENDER NOTICE

Bids are hereby invited from capable and experienced service provider for the:

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION AND 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE.

Only tenderers who have provided the following mandatory information and documents to be used to evaluate the bidder's responsiveness will be considered for further evaluation on functionality.

The Mpumalanga Co-operative Governance, Human Settlements and Traditional Affairs invites bids for the construction of **APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 AND 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE.**

BID documents will be obtainable from the following supply chain management offices **Mbombela Riverside Government Complex, Malelane 24 Air Street, Siyabuswa Old Parliament Building, Middleburg Department of Public Works, KwaMhlanga Government Complex Department of Finance, Piet Retief no. 11 Mearsorch Street, Secunda no.5 van eck street (opposite sasol value gas garage , Elukwatini Sub-Regional Offices and Bushbuckridge Advice Centre, Department of Finance, on payment of a non-refundable levy of **R250.00** or can be downloaded at <http://www.etenders.gov.za/content/advertised-tenders>. Only EFT or cash will be accepted and document can be collected between 7:45 and 16:00.**

Duly completed BIDs enclosed in a sealed envelope marked **APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 AND 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE** ' with the name of the Bidder, shall be deposited in the clearly marked BID boxes provided **at the following** Supply Chain Offices: Mbombela, Malelane, Bushbuckridge, KwaMhlanga, Middleburg, Piet Retief, Secunda, Siyabuswa and Secunda .

A Compulsory Site Briefing will be conducted as per the bid bulletin advert and prospective service providers are requested to meet the Employer / Representative at **Kamhlushwa Ext 2 & 3 Bulk Services Project Site** for a briefing, followed by a site inspection

Kamhlushwa Ext 2 & 3 Bulk Services Project site :: 25°40'36.07"S; 31°41'15.70"E

Telegraphic, telephonic, telex, facsimile, e-mail and late bids **WILL NOT** be accepted.

Bidders should ensure that bids are delivered on time to the correct address. If the bid is late, it will not be accepted for consideration.

All documentation submitted in response to this bid must be in English, unless otherwise indicated under technical specification.

Employer:	Engineer:
HEAD OF DEPARTMENT Dept. of Co-operative Governance, Human Settlements and Traditional Affairs Private Bag X11328 Nelspruit, 1200 Phone: 013 766 6315 Contact: Mr P.G Mpofo E-mail: pgmpofu@mpg.gov.za	PEROZZ CONSULTING ENGINEERS 14 Lost Trail Street Nelspruit, 1200 Telephone No: 010 634 1462 Cell No: 073 185 6632 Contact: Mr S Bizre E-mail: perozzconsultant@gmail.com

T1.2 : TENDER DATA

The conditions of tender are the standard conditions of tender as contained in SANS 10845-3 Construction procurement, Part 3: Standard conditions of tender, that apply specifically to this tender.

The Tender Data shall be read with the Standard Conditions of Tender in order to expand on the Tenderer's obligations and the Employer's undertakings in administering the tender process in respect of the project under construction.

The Tender Data hereafter shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender

Each item of data given below is cross-referenced to the clause in the standard conditions of tender to which it mainly applies.

Clause	Data
	<p>The conditions of tender are those contained in the latest edition of SANS 10845-3, Construction Procurement – Part 3: Standard conditions of tender.</p> <p>SANS 10845-3 makes several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the provisions of SANS 10845-3.</p> <p>Each item of data given below is cross-referenced to the clause in SANS 10845-3 to which it mainly applies.</p>
3.1	The employer is Mpumalanga Department of Co-operative Governance, Human Settlements and Traditional Affairs
3.2	<p>The tender documents issued by the employer comprise the following documents:</p> <p>THE TENDER</p> <p>Part T1: Tendering procedures</p> <p>T1.1 - Tender notice and invitation to tender</p> <p>T1.2 - Tender data</p> <p>Part T2: Returnable documents</p> <p>T2.1 - List of returnable documents</p> <p>T2.2 - Returnable schedules</p> <p>THE CONTRACT</p> <p>Part C1: Agreements and Contract data</p> <p>C1.1 - Form of offer and acceptance</p> <p>C1.2 - Contract data</p> <p>C1.3 - Performance Bond</p> <p>Part C2: Pricing data</p> <p>C2.1 - Pricing assumptions</p> <p>C2.2 - Bill of Quantities</p> <p>Part C3: Scope of work</p> <p>C3 - Scope of work</p> <p>Part C4: Site information</p> <p>C4 - Site information</p> <p>Part C5: Annexures</p>
3.4	<p>The employer's agent is</p> <p>Perozz Consulting Engineers</p> <p>14 Lost Trail Street</p> <p>Nelspruit, 1200</p> <p>Telephone No: 010 634 1462</p> <p>Cell No: 073 185 6632</p> <p>Contact: Mr S Bizre</p> <p>E-mail: perozzconsultant@gmail.</p>

3.5 The language for communications is English.

3.6 The competitive negotiation procedure shall not be applied.

4. Special Conditions of Tender

4.1 Only those tenderers who satisfy the following evaluation criteria eligibility criteria and who provide the required evidence in their tender submissions are eligible to submit tenders and have their tenders evaluated: Evaluation Phases: Phase One, Phase Two and Phase Three.

a) CIDB registration

Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a minimum **9CE and or above** class of construction work, are eligible to have their tenders evaluated.

Tenderers registered as potentially emerging enterprises but with a CIDB contractor grading designation lower than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations, are not eligible to have their tenders evaluated.

For the sake of clarity and subject to satisfactory proof of a tenderer's ability to perform the work specified at the tendered value, the Employer lists in the table below the margins it considers reasonable. However, in the event that the sum tendered exceeds the margins shown then such tender shall be deemed non-responsive.

Category of tender	Upper limits per CIDB Regulation 17
CE 5	R10m
CE 6	R20m
CE 7	R60m
CE 8	R200m
CE 9	No limit

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 class of construction work in line with the CIDB Regulations; and
3. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **9CE and or above** of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

b) Key Personnel

In order to be considered for an appointment in terms of this tender, the tenderer must have in its permanent employment key personnel who will be the single point accountability and responsibility for the management of the construction works. Alternatively, a signed undertaking from an organisation having the required personnel, stating that they will undertake the necessary work on behalf of the tenderer in terms of a sub-contractor agreement, will be acceptable. Such undertaking must be attached to Forms U of the Returnable Schedules.

Individuals must be identified for each of the key personnel listed under Forms U.

Where the key personnel are no longer available to undertake the necessary work after the award of the tender, the contractor shall within a period of 14 working days replace the key personnel listed in Forms U with personnel with equivalent competencies and subject to approval by the Employer. Such approval shall not be unreasonably withheld.

The key person shall be a suitably qualified and experienced contracts manager who will be the single point accountability and responsibility for the management of the construction works, and who is registered with SACPCMP as Pr CM or ECSA as Pr Eng or Pr Tech Eng shall be required as a minimum.

Where the Contracts Manager will not be employed on the Works full time, his powers will be delegated to the approved construction manager.

Failure to comply with the requirements or to complete Form U may render the tender non-responsive.

c) National Treasury Central Supplier Database

Tenderers who are not registered on the National Treasury Central Supplier Database at close of tender, shall submit a copy of their application of registration, with their tender submission. Tenders received from such tenderers who have not submitted proof of their registration within 21 days after the closing date for tender submissions, will not be considered. Registration report from the National Treasury Central Supplier Database, **printed after advert date, before tender closing date and time.**

If the tenderer fails to comply with the above-mentioned criteria he will be disqualified and will not be evaluated for quality criteria.

(d) Local Content and Production

Only locally produced or locally manufactured **goods** meeting the stipulated minimum threshold for local production and content will be considered and the minimum threshold for local production and content in terms of DTIC classification.

Only locally produced or locally manufactured steel products, meeting the stipulated minimum threshold for local production and content will be considered and the minimum threshold for local production and content in terms of DTI classification.

The exchange rate to be used for the calculation of local production and content must be the exchange rate published by the South African Reserve Bank (SARB) at 12:00 on the date of the advertisement of the bid.

Please note that only the South African Bureau of Standards approved technical specification number SATS1286:2011 must be used to calculate the local content.

Prospective service providers are required by law to complete the SBD 6.2 (Declaration Certificate for Local Production and Content for Designated Sectors) with its Templates - Annex C, D and E (Local Production). Failure to complete the mandatory documents will lead to the bid under consideration being declared non-responsive.

4.6 Failure to apply instructions contained in addenda may render a tenderer's offer non-responsive in terms of Condition of Tender 5.8.

4.7 The arrangements for the compulsory clarification meeting are as stated in the tender notice and invitation to tender.

The onus rests with the tenderer to ensure that the person attending the clarification meeting on its behalf is appropriately qualified to understand all directives and clarifications given at that meeting.

The clarification meeting shall start strictly at the time advertised. Only then will the Employer's Representative circulate the attendance register for completion by those present. During this time latecomers may enter and complete the register. On completion by all present the Employer's Representative may :

- (a) read out from the collected lists calling for confirmation that all have signed;
- (b) close the door and not allow any latecomers to enter.

The signature on the attendance register and duly completed and signed Form A shall be considered proof that the tenderer attended the whole meeting and was available to hear all directives and clarifications given at the meeting.

Tenderers must sign the attendance list in the name of the tendering entity. Addenda will be issued to and tenders will be received only from those tendering entities appearing on the attendance list or publish on available media or publish on media used to advertise the bid.

4.8 Request clarifications at least 7 working days before the closing time.

4.10 Tenderers are required to state the rates and currencies in Rand.

4.12 If a tenderer wishes to submit an alternative tender offer, the only criteria permitted for such alternative tender offer is that it demonstrably satisfies the Employer's standards and requirements, the details of which may be obtained from the Employers Agent.

Calculations, drawings and all other pertinent technical information and characteristics as well as modified or proposed Pricing Data must be submitted with the alternative tender offer to enable the Employer to evaluate the efficacy of the alternative and its principal elements, to take a view on the degree to which the alternative complies with the Employer's standards and requirements and to evaluate the acceptability of the pricing proposals. Calculations must be set out in a clear and logical sequence and must clearly reflect all design assumptions. Pricing Data must reflect all assumptions in the development of the pricing proposal.

Acceptance of an alternative tender offer will mean acceptance in principle of the offer. It will be an obligation of the contract for the tenderer, in the event that the alternative is accepted, to accept full responsibility and liability that the alternative offer complies in all respects with the Employer's standards and requirements.

The modified Tender Data must include an amount equal to 5% of the amount tendered for the alternative offer to cover the employer's costs of confirming the acceptability of the detailed design before it is constructed.

4.13.1 Parts of each tender offer communicated on paper shall be submitted as an original, no copies required.

The signed print-out shall be taken as the valid submission.

4.15 It is in the tenderer's interest to ensure that the delivery of the tender offer is recorded in the Employer's tenders received register.

4.13.4 The tenderer is required to submit all certificates as listed in the Schedule of Tender Compliance (Form W).

4.13.5 Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.

4.14 The closing time for submission of tender offer is as stated in the Tender Notice and Invitation to Tender.

4.15 **The tender offer validity period is 120 days.**

4.15.2 Where a tenderer, at any time after the opening of his tender offer but prior to entering into a contract based on his tender offer:

- a) withdraws his tender;

- b) gives notice of his inability to execute the contract in terms of his tender; or
- c) fails to comply with a request made in terms of 4.17, 4.18 or 5.9,

such tenderer shall be barred from tendering on any of the Employer's future tenders for a period to be determined by the Employer, but not less than six (6) months, from the date of tender closure. The Employer may fully or partly exempt a tenderer from the provisions of this condition if he is of the opinion that the circumstances justify the exemption.

4.18 Any additional information requested under this clause must be provided within 5 (five) working days of date of request.

4.20 The tenderer is required to submit with his tender a **letter of intent** from an approved insurer undertaking to provide the Performance Bond to the format included in Part C1.8 of this procurement document.

5. PUBLICATION AND ADDENDUM

5.1 The employer shall respond to clarifications received up to 7 working days before tender closing time.

5.2 The employer shall issue addenda until 10 working days before tender closing time. Addendums shall be uploaded onto **ETENDER PUBLICATION PORTAL WEBSITE: WWW.ETENDERS.GOV.ZA**

5.4 Tenders will be opened in public soon after closing time mentioned above and recording of received documents at the Tender office. Tenderers' names and total prices where practical will be read out.

5.5 In the event of disqualification, the Employer may, at its sole discretion, impose a specified period during which tender offers will not be accepted from the offending tenderer and report same to CIDB and National Treasury.

5.6 Arithmetical errors, omissions, discrepancies and imbalanced unit rates

Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount appearing in the summary to the Pricing Schedule shall govern.

Check responsive tender offers for:

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

Notify shortlisted tenderers of all errors, omissions or imbalanced rates that are identified in their tender offers.

Where the tenderer elects to confirm the errors, omissions or re-balancing of imbalanced rates the tender offer shall be corrected as follows:

- a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the unit rate shall govern and the line item total shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted and the unit rate shall be corrected.
- b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall be corrected.
- c) Where the unit rates are imbalanced adjust such rates by increasing or decreasing them and selected others while retaining the total of the prices derived after any other corrections made under (a) and (b) above.

Where there is an omission of a line item, no correction is possible and the offer may be declared non-responsive.

Declare as non-responsive and reject any offer from a tenderer who elects not to accept the corrections proposed and subject the tenderer to the sanction under 4.16.2.

The tenderer is required to submit balanced unit rates for rate only items in the pricing schedule. The rates submitted for these items will be taken into account in the evaluation of tenders. The procedure for the evaluation of responsive tenders ;

PART T2: RETURNABLE DOCUMENTS

- a) Failure to fully complete and submit the **compulsory** returnable documents shall render such a tender offer unresponsive.
- b) Tenderers shall note that their signatures appended to each returnable form **represents a declaration that they vouch for the accuracy and correctness of the information provided**, including the information provided by candidates proposed for the specified key positions.
- c) **Notwithstanding any check or audit conducted by or on behalf of the Employer, the information provided in the returnable documents is accepted in good faith and as justification for entering into a contract with a tenderer. If subsequently any information is found to be incorrect such discovery shall be taken as wilful misrepresentation by that tenderer to induce the contract.** In such event the Employer has the discretionary right under contract condition 9.2 to terminate the contract.

The Tenderer must complete the following returnable Schedules:

Returnable Schedules required for Evaluation purposes.

6. EVALUATION PROCESS

The evaluation process comprises of the following: -

the Department of CoGHSTA shall for all Bids, which conform to the specifications, evaluate in accordance with the Preferential Procurement Policy Framework 2000 (Act 5 of 2000), the revised Preferential Procurement Regulations 2022, its applicable legislations and instruction notes, therefore 90 points for price and 10 points for the specific goals points will apply .

6.1 PHASE 1 (A): MANDATORY RETURNABLES

The following returnable documents **must** be fully completed and submitted together with the **bid document** for the submission to be considered responsive:.

- 1.1 Service providers are required to fully complete and sign all the attached SBD forms including Annexure C and submit together the Bid Document.
- 1.2 Attach certified copy of identity documents (ID) of company directors.
- 1.3 Attach certified copy of the company registration certificate issued by the Companies and Intellectual Property Commission (CIPC).
- 1.4 Attach valid COIDA registration certificate.
- 1.5 Valid Proof of registration with CIDB for grading works and class: Minimum **9CE and or above** , in case of a Joint Venture, a system generated joint CIDB Grading will be required.
- 1.6 Attach a verifiable copy of municipal accounts for both the director(s) and company
 - o if aforementioned account information of the bidder is not applicable, the bidder must attach an original certified copy of proof of residence (PTO) issued by a relevant traditional authority or a copy of a valid lease agreement accompanied by water and/or electricity account
- 1.7 attach a signed Joint Venture or Consortium Agreement if applicable
- 1.8 A signed commitment letter by the bidder, clearly indicating committing to utilise Local Labourers.
- 1.9 Attendance of compulsory briefing session and signing of attendance register.
- 1.10 The Bill of Quantities must be fully completed.
- 1.11 The company profile must be attached.
- 1.12 The public liability insurance must be attached.
- 1.13 Attach Health and Safety plan.
- 1.14 Attach Programme of works with clear activities aligned to project duration 36 months.

Local Content Calculation

All bidders who passed the first phase will be evaluated on the correctness and completeness of the SBD

6.2 Annexure C of the Local Production and content

The following items are part of the BoQ and are designated according to the Department of Trade and industry (DTI)

No	Designated items	Designated percentage
1	Construction Material and Components	100%
2	Cement	100%
3	Steel and Prefabricated Steel material	100%
4	Joining/Connecting Components	100%
5	Fasteners	100%

6	Electrical cables	90%
7	steel value added products	100%
8	Valves	70%
9	Pumps	70%
10	Motor	70%
11	PVC Pipes	100%

- A bidder who will score below the stipulated percentage must have an exemption letter from DTI that they are allowed to be further evaluated on functionality even if they have scored below the stipulated percentage.
- A bidder must calculate each item separately as per the Guidance Document for the Calculation for Local Content.
- The exchange rate to be used for the calculation of local production and content will be the exchange rate published by the South African Reserve Bank (SARB) at 12:00 on the date of advertisement of the bid; and only the South African Bureau of Standard (SABS) approved technical specification number SATS 1286; 2011 must be used to calculate local content.
- The local content (LC) expressed, as a percentage of the bid price must be calculated in accordance with the following formula, which must be disclosed in the bid documentation:

$$LC = \frac{(1 - X)}{Y} * 100$$

Where

- X is the imported content in Rand
- Y is the bid price in Rand excluding value added tax (VAT)

- Prices referred to in the determination of x will be converted to Rand (ZAR) by using the exchange rate published by the SARB at 12:00 on the date of advertisement of the bid.
- The SABS approved technical specification number SATS 1286:2011 and the Guidance of the calculation of local together with the Local Content Declaration Templates (Annexure C (Local Content Declaration: Summary Schedule), D (Imported Content Declaration: Supporting Schedule to Annexure C) and E (Local Content Declaration: Supporting Schedule to Annexure C) are accessible to all potential bidders on the dti's official website <http://www.thedit.gov.za/industrialdevelopment/ip.jsp> at no cost.

NB: It is the responsibility of the bidder to ensure that the following key information is in order on CSD to avoid disqualification during the bid evaluations:

1. The Business registration status in order
2. Bid restrictions and defaulters status – not registered
3. Identification number and the service of the state status - No government employee
Directors

NB: Failure to adhere to any of the above conditions on returnable documents will result in your bid being disqualified.

6.1 PHASE 1 (B): RETURNABLE DOCUMENTS FOR FUNCTIONALITY EVALUATION PURPOSE.

- Bank rating
- Proof of registration
- Key personnel (attach CV and certified copies of proof of qualifications)
(Certification date should not be older than 12 months)
- Available Equipment owned and or hired
- Proof of completed projects appointment letters/order with completion certificates

PHASE 2: EVALUATION CRITERIA (FUNCTIONALITY)

Responses will be evaluated using a predetermined set of evaluation criteria. The evaluation criteria are designed to reflect the Department's requirements in terms of identifying a suitable service provider and ensure the selection process is transparent and affords all the bidders a fair opportunity for evaluation and selection.

Evaluation Criteria in respect of Functionality

No.	Quality Criteria	Sub-Criteria	Total score	
1. Management and CVs of Personnel	Curriculum Vitae of the Site agent with 5 years' and above as Site Agent/Project manager/team leader in relevant works of similar scope and value. (attach signed CV with certified copies of qualifications and professional registration)	Per personnel. 5 Years & above = 5 3 but to 5 Years = 4 2 to 3 Years = 3 1 to 2 years = 2 Less than 1 year = 1	15	
2. Previous Experience	completed projects of different categories (water, sanitation and roads and storm water) With same CIDB grading level completed in the past 10 years. Highlight similarities between the completed projects and the specifications of this project. Provide details of employers for these projects: 13 points will be awarded for each similar project completed to a maximum of 65 points. If no projects have been completed in the relevant CIDB grading and scope no points will be awarded. Attach Orders /Appointment letters together with Completion Certificates. 13 points per project	9CE and or above	65	
	Project 1			13
	Project 2			13
	Project 3			13
	Project 4			13
	Project 5			13

3. Access to Material, Plant and Equipment	Access to Material, Plant and Equipment Access to home building material support and availability of plant and equipment. The tenderers should submit confirmation letters for access to building material support and availability of plant and equipment. 2.5 points each for owned. 2 points for each if hired.	Tipper trucks, Bomag, TLB, Water trucks Attach Copies of Plant and Equipment Certificates in the name of Company or Director or intent letter/Agreement with copies of Certificates in case of hire points not cumulative.	10
4. Bank Rating	Bank Rating Issued with a stamp from a reputable bank (bank recognised by RSA government.) Attach a bank rating letter: dated after bid advert	The points will be allocated as follows: 1. A&B grading- 5-pts 2. C grading -4 pts 3. D grading -2 pts E and below -0 pts	5
5. Locality	Locality This is in respect to the area where the company's head office or main address is located. Attach Company Business Registration document or lease agreement with water and or Electricity account and or municipal services account.	1. District – 5 points 2. Mpumalanga Province – 3 points 3. National (RSA) – 1,5 points	5
Grand Total			100

NB: Bidders who obtained less than the minimum set threshold of 70 points will be declared non responsive and therefore will not be eligible for the next stage of evaluation.

Only bidders who obtained a minimum of 70 points and or above on functionality will be considered for further evaluation.

6.3 PHASE 3: HDI, SPECIFIC GOALS AND PRICE

- a) Price / Financial proposal must be submitted in South African Rand.
- b) The following formula will be used to calculate the points for price in respect of this bid:

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

P min

Where

P_s= Points scored for comparative price of bid under consideration

Pt= Comparative price of bid under consideration

P min = Comparative price of lowest acceptable bid

- c) The responsive bids will be adjudicated by the State on the 90/10-preference point for Specific Goals in terms of which points are awarded to bidders on the basis of:
- The bid price (maximum **90 points**)
 - Specific goals (maximum **10 points**)
- d) The department reserves the right to arrange contracts with more than one contractor.
- e) The Preferential Procurement Policy Framework Act 2000 (PPPFA) Preferential Procurement Regulations 2022
- f) A maximum of **10 points** may be awarded to a bidder for specific goals

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

POINTS FOR CONTRACTING AN ENTERPRISE OWNED BY HISTORICALLY DISADVANTAGED PERSONS OR INDIVIDUALS		
HISTORICALLY DISADVANTAGED PERSONS OR INDIVIDUALS	POINTS ALLOCATION	SOURCE DOCUMENTS REQUIRED TO CLAIM POINTS
Female	2,0	Attach a copy of a Full CSD report printed after advert date
Youth	2,0	
People living with disability	2,0	A copy of a valid Medical Certificate to confirm disability
Military Veterans	1,0	A certified copy of military veteran certificate
Locality: within relevant areas	3,0	Attach a certified copy of business registration document or lease agreement together with Proof of municipal levies and or rates and taxes account or water and or Electricity accounts) Points will be allocated as follows. <ul style="list-style-type: none">• 1 x point business is within Mpumalanga Province• 1 x point business is within Ehlanzeni District.• 1 x point is within Nkomazi Local Municipality
TOTAL PREFERENCE POINTS TO BE CLAIMED	10	

A maximum of 10 points may be awarded to a tenderer for the specific goal specified for the tender.

The points scored for the specific goal must be added to the points scored for price and the total must be rounded off to the nearest two decimal places.

Subject to section 2(1)(f) of the Act, the contract must be awarded to the tenderer scoring the highest points.

FORM A: CERTIFICATE OF ATTENDANCE AT CLARIFICATION MEETING

Notes to Tenderer:

1. Unless the attendee's name, details and signature also appear on the attendance register this Certificate of Attendance shall not be accepted and the tenderer's offer shall be deemed non-responsive.

This is to certify that I,
representative of (tenderer)
of (address)
.....
.....
telephone number
fax number
e-mail
attended the clarification meeting on (date)

Signature of Representative _____

FORM B: RECORD OF ADDENDA TO TENDER DOCUMENTS

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

	Date	Title or Details
▪		
▪		
▪		
▪		
▪		
▪		
▪		
▪		
▪		
▪		

Attach additional pages if more space is required.

Signed _____

Date _____

Name _____

Position _____

FORM C: PROPOSED AMENDMENTS, QUALIFICATIONS AND ALTERNATIVES

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

The Tenderer's attention is drawn to clause 5.8 of SANS 10845-3 regarding the employer's handling of material deviations and qualifications.

(a) AMENDMENTS

Page, Clause or Item No	Proposed Amendment

- Note: (1) Amendments to the General and Special Conditions of Contract are not acceptable;
 (2) The Tenderer must give full details of all the financial implications of the amendments and qualifications in a covering letter attached to his tender.

(This is not an invitation for alternatives but should the Tenderer desire to make any departures for the provisions of this contract he shall set out his proposals clearly hereunder.

(b) ALTERNATIVES

Proposed Alternative	Description of Alternative

- Note: (1) Individual alternative items that do not justify an alternative tender, and an alternative offer for time for completion should be listed here
 (2) In the case of a major alternative to any part of the work, a separate Bill of Quantities, programme, etc. and a detailed statement setting out the salient features of the proposed alternatives must accompany the tender
 (3) Alternative tenders involving technical modifications to the design of the works and methods of construction shall be treated separately from the main tender offer.

Signed _____ Date _____
 Name _____ Position _____

FORM E: COMPULSORY DECLARATION (SBD 4)

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

Section 1: Enterprise Details

Name of enterprise:	
Contact person:	
Email:	
Telephone:	
Cell no	
Fax:	
Physical address	
Postal address	

Section 2: Particulars of companies and close corporations

Company / Close Corporation registration number	
--	--

Section 3: SARS Information

Tax reference number	
VAT registration number:	<i>(State Not Registered if not registered for VAT)</i>

Section 4: CIDB registration number

CIDB Registration number (if applicable)	
---	--

Section 5: National Treasury Central Supplier Database

Supplier number	
Unique registration reference number	

Section 6: Particulars of principals

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

Full name of principal	Identity number	Personal tax reference number

Attach separate page if necessary

Section 7: Record in the service of the state

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

- a member of any municipal council
 - a member of any provincial legislature
 - a member of the National Assembly or the National Council of Province
 - a member of the board of directors of any municipal entity
 - an official of any municipality or municipal entity
- an employee of any department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act of 1999 (Act No. 1 of 1999)
- a member of an accounting authority of any national or provincial public entity
- an employee of Parliament or a provincial legislature

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

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

*insert separate page if necessary

Section 8: Record of family member in the service of the state

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

Indicate by marking the relevant boxes with a cross, if any family member of a principal as defined in section 5 is currently or has 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 family member	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

*insert separate page if necessary

Section 9: Record of termination of previous contracts with an organ of state

Was any contract between the tendering entity including any of its joint venture partners terminated during the past 5 years for reasons other than the employer no longer requiring such works or the employer failing to make payment in terms of the contract.

Yes No (Tick appropriate box)

If yes, provide particulars (interest separate page if necessary)

Section 10: Declaration

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

- i) neither the name of the tendering entity or any of its principals appears on:
 - a) the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004 (Act No. 12 of 2004)
 - b) National Treasury's Database of Restricted Suppliers (see www.treasury.gov.za)
- ii) neither the tendering entity or any of its principals has within the last five years been convicted of fraud or corruption by a court of law (including a court outside of the Republic of South Africa);
- iii) any principal who is presently employed by the state has the necessary permission to undertake remunerative work outside such employment (attach permission to this declaration);
- iv) the tendering entity is not associated, linked or involved with any other tendering entities submitting tender offers
- v) has not engaged in any prohibited restrictive horizontal practices including consultation, communication, agreement, or arrangement with any competing or potential tendering entity regarding prices, geographical areas in which goods and services will be rendered, approaches to determining prices or pricing parameters, intentions to submit a tender or not, the content of the submission (specification, timing, conditions of contract etc) or intention to not win a tender;
- vi) has no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest;
- vii) neither the tenderer or any of its principals owes municipal rates and taxes or municipal service charges to any municipality or a municipal entity and are not in arrears for more than 3 months;
- viii) SARS may, on an on-going basis during the term of the contract, disclose the tenderer's tax compliance status to the Employer and when called upon to do so, obtain the written consent of any subcontractors who are subcontracted to execute a portion of the contract that is entered into in excess of the threshold prescribed by the National Treasury, for SARS to do likewise.

Signed

Date

.....

.....

Name

Position

.....

.....

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

NOTE 2: Section 30(1) of the Public Service Act, 1994, prohibits an employee (person who is employed in posts on the establishment of departments) from performing or engaging remunerative work outside his or her employment in the

relevant department, except with the written permission of the executive authority of the department. When in operation, Section 8(2) of the Public Administration Management Act, 2014, will prohibit an employee of the public administration (i.e. organs of state and all national departments, national government components listed in Part A of Schedule 3 to the Public Service Act, provincial departments including the office of the premier listed in Schedule 1 of the Public Service Act and provincial departments listed in schedule 2 of the Public Service Act, and provincial government components listed in Part B of schedule 3 of the Public Service Act) or persons contracted to executive authorities in accordance with the provisions of section 12A of the Public Service Act of 1994 or persons performing similar functions in organs of state from conducting business with the State or to be a director of a public or private company conducting business with the State. The offence for doing so is a fine or imprisonment for a period not exceeding 5 years or both. It is also a serious misconduct which may result in the termination of employment by the employer.

NOTE 3: Regulation 44 of Supply Chain Management regulations issued in terms of the Municipal Finance Management Act of 2003 requires that organs of state and municipal entities not award a contract to a person who is the service of the state, a director, manager or principal shareholder in the service of the state or who has been in the service of the state in the previous twelve months.

NOTE: 4: Regulation 45 of Supply Chain Management regulations requires a municipality or municipal entity to disclose in the notes to the annual statements particulars of any award made to a close family member in the service of the state.

NOTE: 5 Corrupt activities which give rise to an offence in terms of the Prevention and Combating of Corrupt Activities Act of 2004) include improperly influencing in any way the procurement of any contract, the fixing of the price, consideration or other moneys stipulated or otherwise provided for in any contract and the manipulating by any means of the award of a tender.

NOTE: 6 Section 4 of the Competition Act of 1998 prohibits restrictive horizontal practice including agreements between parties in a horizontal relationship which have the effect of substantially preventing or lessening competition, directly or indirectly fixing prices or dividing markets or constitute collusive tendering. Section 5 also prohibits restrictive vertical practices. Any restrictive practices that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties.

ATTACH THE FOLLOWING DOCUMENTS TO THIS PAGE

- **For Closed Corporations**

CK1 or CK2 as applicable (Founding Statement)
Certified Copies of the ID's of the Directors
Certified Shareholders Certificate

OR

- **For Companies**

A copy of the Certificate of Incorporation
Certified Copies of the ID's of the Directors, and
Certified shareholders register

OR

- **For Joint Venture Agreements**

- Joint Venture Agreement between all the parties,
- as well as the documents in (1) or (2) of each Joint Venture member.

OR

- **For Partnership**

1. Certified Copies of the ID's of the partners

OR

- **One person Business / Sole trader**

2. Certified Copy of ID

FORM M: AUTHORITY OF SIGNATORY

Details of person responsible for tender process:

Name :

Contact number :

Office address :

Signatories for close corporations and companies shall confirm their authority by attaching to this form a **duly signed and dated original or certified copy on the Company Letterhead** of the relevant resolution of their members or their board of directors, as the case may be.

PRO-FORMA FOR COMPANIES AND CLOSE CORPORATIONS:

"By resolution of the board of directors passed on *(date)*

Mr

has been duly authorized to sign all documents in connection with the Tender for Contract Number/Name

.....and any Contract which may arise there from on

behalf of

(BLOCK CAPITALS)

SIGNED ON BEHALF OF THE COMPANY

IN HIS CAPACITY AS

DATE

FULL NAMES OF SIGNATORY

SIGNATURE

AS WITNESSES: 1. NAME SIGNATURE

2. NAME SIGNATURE

PRO-FORMA FOR JOINT VENTURES:

Certificate of Authority for Joint Ventures

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorise..... Mr/Ms authorised signatory of the company, acting in the capacity of lead partner, to sign all documents in connection with the tender offer an any contract resulting from it on our behalf.

NAME OF FIRM	ADDRESS	DULY AUTHORISED SIGNATORY
		Signature: Name: Designation:

ATTACHED HERETO THE DULY SIGNED AND DATED ORIGINAL OR CERTIFIED
COPY OF AUTHORITY OF SIGNATORY ON COMPANY LETTERHEAD

FORM O: PROOF OF GOOD STANDING WITH COMPENSATION COMMISSIONER

Notes to tenderer:

1. Discovery that the tenderer has failed to make proper disclosure may result in Co-operative Governance, Human Settlements and Traditional Affairs terminating a contract that flows from this tender on the ground that it has been rendered invalid by the tenderer's misrepresentation.
2. The tenderer shall attach to this Form evidence that he is registered and in good standing with the compensation fund or with a licensed compensation insurer who is approved by Department of Labour in terms of section 80 of the Compensation for Injury and Disease Act 1993 (COID) (Act 130 of 1993).

Affix certified Proof of Good Standing with Compensation Commissioner to this page

FORM P: SCHEDULE OF CURRENT COMMITMENTS

Notes to tenderer:

- (a) The tenderer shall list below all contracts currently under construction or awarded and about to commence and tenders for which offers have been submitted but awards not yet made.
- (b) In the event of a joint venture enterprise, details of all the members of the joint venture shall similarly be attached to this form.
- (c) The lists must be restricted to not more than 5 contracts and 5 tenders. If a tenderer's actual commitments or potential commitments are greater than 5 each, those listed should be in descending order of expected final contract value or sum tendered.

Contracts Awarded				
Employer	Project	Expected Value of contract (Inclusive of VAT)	Durations (Months)	Expected Completion Date

Tenders not Yet Awarded				
Employer	Project	Tendered Amount (Inclusive of VAT)	Tendered Durations (Months)	Expected Commencement Date

Signature

Date

Capacity under which Tender is Signed

Name of Tenderer

FORM Q: REGISTRATION WITH CIDB

The tenderer shall provide a printed copy of the Active Contractor's Listing off the CIDB website. (www.cidb.org.za). Tenderers whose CIDB registration expires within 21 days after close of tender should attach proof of their application for re-registration (refer to Tender Data Clause 4.1). In the case of a Joint Venture, a printed copy of the Active Contractor's Listing must be provided for each member of the Joint Venture.

Name of Contractor:

Contractor Grading Designation:

CIDB Contractor Registration Number:

Expiry Date:

FORM R: COMPANY EXPERIENCE IN RELATION TO SCOPE OF WORKS

Appointment letter of Relevant Work (to be attached)	Consulting Engineer: Contact Person and Telephone Number	Employer: Contact Person and Telephone Number	Value of Work (inclusive of VAT)	Date Completed (Attach Certified Completion Certificate or Letter of Reference)	Points Awarded by the Engineer
*Attach additional pages if more space is required		Total Points			

SECTION A: Particulars of Employer who commissioned the Works.

Provide the following information on the Employer for whom the contract was performed.

Employer: _____

Employer's contact person: Title: _____ Initials: _____ Surname: _____

Telephone: (_____) _____ Cell: _____

SECTION B: Particulars of Contract Administrator

Person responsible for administering the contract on behalf of the employer, e.g.: Consulting Engineer

Title: _____ Initials: _____ Surname: _____

Organisation: _____

Telephone: (_____) _____ Fax: (_____) _____

Cell: _____ Email: _____

SECTION C: Contract Information

Contract title: _____ Employer's Contract No. _____

Description of Contract: _____

Indicate the class of works to which the track record is applicable. Please indicate with an "X"

General Building Electrical Civil Engineering

Mechanical Specialist works

Specify which class of specialist works: _____

Were you involved as: Main Contractor Sub Contractor

Contract award date: _____ Practical completion date: _____

Province: _____ Municipality: _____

FORM S: PLANT & EQUIPMENT

The tenderer will receive a maximum of 10 points based on information provided in this schedule.

1. 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 tender is accepted.
2. The tenderer will receive Quality points for listing of plant available for this specific contract as follows:
 - Major plant for construction works if well identified and 100% is owned and available at start of contract maximum points will be as stated in allocated points if owned column.
 - Maximum points for hired plant will be as stated in the Allocated points for hired plant column.
 - If Quantity required is two with one owned and one hired the tenderer can only score 50% of the points for owned and hired plant.
 - Plant correctly identified and owned will be calculated according to allocated points.
3. Proof of ownership to be submitted.

Description, size, capacity, etc.	Allocate Points if owned	Allocate Points if hired	Quantity Required	Quantity owned	Quantity hired	Points Scored
-----------------------------------	--------------------------	--------------------------	-------------------	----------------	----------------	---------------

Motor grader (Cat 14H or Similar)			1			
Excavator (20 ton)			1			
Water Tanker (8000 Litre)			1			
Vibratory Roller (2.5 ton)			1			
Vibratory Roller (10 ton or above)			1			
Tipper Truck (6 m ³)			3			
Tipper Truck (10 m ³ or above)			2			
TLB (48 kw Capacity)			2			
1ton bakkie (single/double)			1			
Total						
Total Points Allocated						

* Attached additional pages if more space is required.

FORM T: FINANCIAL RESOURCES BANKING INFORMATION

The tenderer will receive a maximum of 10 points based on information provided in this schedule.

DETAILS OF TENDERERS BANKING INFORMATION

Notes to tenderer:

- The tenderer shall attach to this form an **Original Letter/bank rating letter** from the bank not older than three (3) months confirming the bank account, details and bank rating. **Failure to provide the required letter with the tender submission shall render the tenderer's offer non-responsive.**
- .
- In the event that the tenderer is a joint venture enterprise, details of all the members of the joint venture shall be similarly provided and attached to this form.

BANK NAME:	
ACCOUNT NAME: (e.g. ABC Civil Construction cc)	
ACCOUNT TYPE: (e.g. Savings, Cheque etc)	
ACCOUNT NO:	
CONTACT PERSON:	
TEL. NO OF BANK / CONTACT:	

How long has this account been in existence:	0 – 6 Months	<input type="checkbox"/>
	7 – 12 Months	<input type="checkbox"/>
	13 – 24 Months	<input type="checkbox"/>
	More than 24 Months	<input type="checkbox"/>
(Tick which is appropriate)		
BANKING RATING	MAXIMUM CLAIMABLE POINTS	POINTS CLAIMED
No Bank Rating		
E or F		
D		
A or B or C		
MAXIMUM POINTS OBTAINABLE		

**ATTACH HERETO AN ORIGINAL LETTER FROM THE BANK TO THIS PAGE
NOT OLDER THAN THREE (3) MONTHS**

KEY PERSONNEL EXPERIENCE (CONTRACTS MANAGER)

The tenderer shall provide details of previous experience required for this project. Proof of registration must be attached to this form.

Name	Position in Team	ECSA Reg. No	Category	SACPCMP Reg. No	Category	No. of Years' Experience
	Contracts Manager					

Technical/Managerial Experience

(List only the most recent 5 projects of the key staff that the tenderer considers relevant to the specified scope of works.

Description of Project	Position Held	Project Start Date	Project Completion Date	Contract Value	Client and Contact Person	Contact No.

KEY PERSONNEL EXPERIENCE (CONSTRUCTION MANAGER)

The tenderer shall provide details of previous experience required for this project. Proof of registration must be attached to this form.

Name	Position in Team	ECSA Reg. No	Category	SACPCMP Reg. No	Category	No. of Years' Experience
	Construction Manager					

Technical/Managerial Experience

(List only the most recent 5 projects of the key staff that the tenderer considers relevant to the specified scope of works.)

Description of Project	Position Held	Project Start Date	Project Completion Date	Contract Value	Client and Contact Person	Contact No.

KEY PERSONNEL EXPERIENCE (MECHANICAL/ELECTRICAL MANAGER)

The tenderer shall provide details of previous experience required for this project. Proof of registration must be attached to this form.

Name	Position in Team	ECSA Reg. No	Category	SACPCMP Reg. No	Category	No. of Years' Experience
	Mechanical/Electrical Manager					

Technical/Managerial Experience

(List only the most recent 5 projects of the key staff that the tenderer considers relevant to the specified scope of works.)

Description of Project	Position Held	Project Start Date	Project Completion Date	Contract Value	Client and Contact Person	Contact No.

ATTACH CV'S OF KEY PERSONNEL TO THIS PAGE

Note: Only CV's and Certified Qualifications of Key personnel that were named and shown on the organogram to be attached.

**FORM V: METHOD STATEMENT FOR CONSTRUCTION WORKS
INCLUDING PROGRAMME**

METHOD STATEMENT

The method statement should cover the Installation of municipal Civil Engineering works at Kamhlushwa Ext 2 and 3 project. The works will comprise of the following main categories:

BULK WATER SUPPLY

*315mm dia.uPVC class 16
250mm dia.uPVC class 16
160mm dia.uPVC class 16
110mm dia.uPVC class 16
Elevated Steel Tank (1000kl)
Command Reservoir (10ML)*

BULK SEWER LINE

*200mm dia. uPVC class 16
250mm dia.uPVC class 34
315mm dia.uPVC class 34
Guardroom And Operator Room
Sewer Lift Pumpstation
Electro-Mechanical Works
Generator
Concrete Pallisade Security Fencing Around Pump Stations (2.4m High)*

ROADS

*Bus Routes 12,5 km total long
Access roads 2,5km total length.
Longitudinal piped stormwater drainage system
Concrete lined stormwater V drains,chutes,drifts
Box and pipe culverts at stream crossings*

The Tenderer shall attach a method statement reflecting the execution of the various activities, construction methods and quality control for this Contract, including accommodation of traffic during construction. The statement shall be in accordance with the information supplied in the Contract, requirements of the Project Specifications and with all other aspects of this Tender.

Signature

Date

Capacity under which Tender is Signed

Name of Tenderer

C 1.1: FORM of OFFER

OFFER

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

CONSTRUCTION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 & 3

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

By the representative of the tenderer, deemed to be duly authorized, signing this part of this form of offer and acceptance, the tenderer offers to perform all of the obligations and liabilities of the contractor under the contract, including compliance with all its terms and conditions according to their true intent and meaning, for an amount to be determined in accordance with the conditions of contract identified in the contract data.

The offered total of the prices, inclusive of any value added tax or sales tax which the law requires the employer to pay, is

_____ (in words)

R _____ (in figures)

This offer may be accepted by the employer by signing the acceptance part of this form of offer and acceptance and returning one copy of this document to the tenderer before the end of the period of validity stated in the tender data, whereupon the tenderer becomes the party named as the contractor in terms of the conditions of the contract identified in the contract data.

for the TENDERER

Signature: _____

Name: _____

Capacity: _____

Name and address: _____

Name and _____ Date: _____

signature of witness _____

C1.2: FORM of ACCEPTANCE

ACCEPTANCE

By signing this part of this form of offer and acceptance, the employer identified below accepts the tenderer's offer. In consideration thereof, the employer shall pay the contractor the amount due in accordance with the conditions of contract identified in the contract data. Acceptance of the tenderer's offer shall form an agreement between the employer and the tenderer upon the terms and conditions contained in this agreement and in the contract, that is the subject of this agreement.

The terms of the contract, are contained in:

Part C 1: Agreements and contract data, (which includes this agreement)

Part C 2: Pricing data

Part C 3: Scope of work.

Part C 4: Site information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C 1 to C4 above.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto as listed in the tender schedules, as well as any changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance, are contained in the schedule of deviations attached to and forming part of this agreement. No amendments to or deviations from said documents are valid unless contained in this schedule.

The tenderer shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the employer's agent (whose details are given in the contract data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy of this document, including the schedule of deviations (if any). Unless the tenderer (now contractor) within five 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.

for the EMPLOYER

Signature: _____

Name: _____

Capacity: _____

Name and address: _____

Name and _____

Date: _____

signature of witness _____

C1.3: SCHEDULE of DEVIATIONS

1 Subject

Details

2 Subject

Details

3 Subject

Details

4 Subject

Details

By the duly authorized representatives signing this agreement, the employer and the tenderer agree to and accept the foregoing schedule of deviations as the only deviations from and amendments to the documents listed in the tender data and addenda thereto as listed in the returnable schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance.

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

for the TENDERER

Signature: _____

Name: _____

Capacity: _____

for the EMPLOYER

(Name and address): _____

Name and _____

signature of witness _____

Date: _____

C1.4: CONTRACT DATA

PART 1

GENERAL CONDITIONS OF CONTRACT

The Conditions of Contract are the *General Conditions of Contract for Construction Works*, Third Edition (2015) published by the South African Institution of Civil Engineering. Copies of these conditions of contract may be obtained from the South African Institute of Civil Engineering (Tel: 011 805 5947).

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

Clause	Data
1.1.1.13	The Defects Liability Period is 12 months calculated from the date of the Certificate of Completion.
1.1.1.14	The time for achieving Practical completion for the construction of Kamhlushwa Bulk Services Project works is 36 months from date of site handover.
1.1.1.15	The Name of the Employer is Mpumalanga Department of Co-operative Governance, Human Settlements and Traditional Affairs The Employer's address for receipt of communications is: Dept. of Co-operative Governance, Human Settlements and Traditional Affairs Private Bag X11328 Nelspruit 1200 Phone: 013 766 6315 Contact: Mr P.G Mpofo E-mail: pgmpofu@mpg.gov.za
1.1.1.16	The name of the Employers Agent is Perozz Consulting Engineers The address of the Employers Agent is: Perozz Consulting Engineers 14 lost trail Street Mbombela 1200 Telephone No: 010 634 1462 Cell No: 073 185 6632 Contact: Mr S Bizure E-simbabizure@gmail.com
5.1.1 5.8.1	The non-working days are Sundays The special non-working days are the official builder's holiday plus all statutory public holidays. The year-end break commences on 11 December 2026 and ends on 11 January 2027 , . 10 December 2027 and ends on 10 January 2028 and 15 December 2028 and ends on 08 January 2029
5.3.1	The documentation required before commencing with the works are: <ul style="list-style-type: none"> ✓ Health and Safety Plan ✓ Risk register ✓ Initial programme ✓ Performance Guarantee ✓ All risk Insurance ✓ Public liability Insurance
5.3.2	The time to submit the documentation required before commencement of the Works is 14 days .

5.13.1	The penalty for failing to complete the works is 0,01% of the Contract Amount per calendar day.
5.16.3	The latent defects period is 10 Years .
6.2.3	The Form of Guarantee is to contain the wording of the proforma document included in the General Conditions of Contract (Pro-forma included in section C1.8 to this document).
6.2.3	The liability of the guarantee shall be 10 % . Failure to provide guarantee will result in 10% guarantee being deducted from each payment certificate.
6.8.2	Contract Price Adjustment is applicable on this tender
6.10.1.5	The percentage advance on materials onsite not yet built into the Permanent Works is 80% .
6.10.3	The percentage retention on the amounts due to the Contractor is 10 % .
8.6.1.1.2	The value of the materials supplied by the Employer to be included in the insurance sum is nil.
8.6.1.1.3	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is nil.
8.6.1.3	The limit of indemnity for liability insurance is R10,000 000.00.
	The variations to the General Conditions of Contract
2.1.2.5	Replace the term “Safety” with “Occupational Health and Safety”
9.2.1.3.7	Replace sub-clause with The Contractor or anyone on his behalf or in his employ would pay, offer or offer as payment to any person in the employ of the Employer, or in the employ of the Employers Agent, a gratuity or reward or commission.
5.12.2.2	<p>The additional clauses to the General Conditions of Contract are:</p> <p>Extensions of time in respect of clause 5.12 in respect of abnormal rainfall shall be calculated using the following formula for each calendar month or part thereof:</p> $V = (Nw - Nn) + \frac{(Rw - Rn)}{X}$ <p>Where:</p> <p>V = Extension of time in calendar days in respect of the calendar month under consideration.</p> <p>Nw = Actual number of days during the calendar month on which a rainfall of 10 mm or more has been recorded.</p> <p>Nn = Average number of days in the relevant calendar month, as derived from existing rainfall records, on which a rainfall of 20mm or more has been recorded for the calendar month.</p> <p>Rw = Actual average rainfall in mm recorded for the calendar month under consideration.</p> <p>Rn = Average rainfall in mm for the calendar month as derived from existing rainfall records as stated in the Site Information.</p> <p>For purposes of the Contract Nn, Rn, X and Y shall have those values assigned to them in the South African Weather Service’s rainfall records of the nearest station to the site.</p>

If V is negative and its absolute value exceeds N_n, then V shall be taken as equal to minus N_n.

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

This formula does not take account flood damage which could cause further or concurrent delays and will be treated separately as far as extension of time is concerned.

The factor (N_w – N_n) shall be considered to represent a fair allowance for variations from the average in the number of days during which rainfall exceeds 10 mm. The factor (R_w – R_n) shall be considered to represent a fair allowance for variations from the average in the number of days during which the rainfall did not exceed 10 mm but wet conditions prevented or disrupted work.

For the purpose of applying the formula, accurate rain gauging shall be taken at a suitable point on the Site and the Contractor shall at his own expense, take all necessary precautions to ensure that rain gauges cannot be interfered with by unauthorised persons.

The rainfall records applicable to this Contract are those as recorded by the South African Weather Atlas. The following values of N_n and R_n shall apply:

Month	R _n (mm)	N _n (days)
January	125	3
February	110	2,5
March	85	1,5
April	45	0,5
May	15	0,1
June	5	0,1
July	10	0,1
August	10	0,1
September	25	0,1
October	75	1
November	105	2
December	120	3
Total	730	14

5.12.2.2

A delay caused by inclement weather conditions will be regarded as a delay only if, in the opinion of the Employers Agent, all progress on an item or items of work on the critical path of the working programme of the contractor has been brought to a halt. Delays on working days only (based on a five-day working week) will be taken into account for the extension of time, but the Contractor shall make provision in his programme of work for an expected delay of "n" working days caused by normal rainy weather, for which he will not receive any extension of time, where "n" equals days. Extension of time during working days will be granted to the degree to which actual delays, as defined above, exceed the number of "n" workings days.

PART 2

DATA PROVIDED BY CONTRACTOR

The Contractor is advised to read the *General Conditions of Contract for Construction Works*, Third Edition (2015) published by the South African Institution of Civil Engineering, in order to understand the implications of this Data which is required to be completed.

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

Clause	Data	
1.1.1.9	The Contractor is:	
1.2.1.2	Name: _____ The Address of the Contractor is: Address (physical): _____ _____ Address (postal): _____ _____ Telephone: _____ Facsimile: _____ E-mail: _____	
1.1.1.14	The Works are to be completed within months.	
6.2.1	Type of security (Value Added Tax is excluded from the contract sum and the value of the works for calculating the percentages)	Contractor's choice (Indicate "Yes" or "No")
	Fixed Performance Guarantee of 10% of the Contract Sum	
6.5.1	The percentage allowance to cover overhead charges is	
6.8.3	The rates for special materials (applicable only to bituminous products), exclusive of Value Added Tax are:	
	(a) N/A	
	(b) N/A	

PRO FORMA

OHS MANDATORY FORM

(TO BE COMPLETED AND SIGNED BY ALL MANDATARIES)

**OCCUPATIONAL HEALTH AND SAFETY ACT
NO. 85 OF 1993**

Note: Section 1(1)(xxviii) of the Act defines a "Mandatory" as including "an Agent, a Contractor or a Sub-contractor for Work."

The Employer and the Contractor hereby agree, in terms of the provisions of Section 37 (2) of the Occupational Health and Safety Act, Act No. 85 of 1993, hereinafter referred to as "the Act", that the Contractor as an employer in its own right and in its capacity as Contractor for the execution of the works, shall have certain obligations and that the following arrangement shall apply between them to ensure compliance by the Contractor with the provisions of the Act, namely:-

- i. The Contractor undertakes to acquaint the appropriate officials and the employees of the Contractor with all relevant provisions of the Act, and the regulations promulgated in terms of the Act, and
- ii. The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and regulations will be fully complied with, and
- iii. The Contractor hereby accepts sole liability for such due compliance with the relevant duties, obligations and prohibitions imposed by the Act and regulations in respect of the work included in the Contract, and
- iv. The Contractor shall be obliged to report forthwith to the Employer any investigation, complaint, or criminal charge which may arise as a consequence of the provisions of the Act and regulations pursuant to work performed on behalf of the Employer, and shall, on written demand, provide full details in writing of such investigation, complaint or criminal charge.

Signed at _____ on the _____ day of _____ 20 _____

WITNESS:

_____ for and on behalf of **Contractor**

WITNESS:

_____ for and on behalf of the **Head of Department
Mpumalanga Co-operative Governance, Human
Settlements and Traditional Affairs**

C1.6 PRO FORMA: DECLARATION OF OWNERSHIP OF UNUSED MATERIALS

In

CERTIFICATE OF PAYMENT NO. _____

I/We, the undersigned, _____

_____ (Name of Contractor)
hereby declare that the materials for which payment is claimed in terms of Clause 6.10.1.5 of the General Conditions of Contract are:

- (a) as described
- * (i) on the copy of Invoice No. _____ annexed hereto
- *(ii) as set out in detail below

*delete whichever is not applicable.

- (b) located at

- (c) is totally owned by me/us and that no other party has any claim or right in respect of the above materials and that I am/we are free to pass ownership upon receipt of payment for such materials
- (d) intended for incorporation into the permanent works of this Contract.

Signed at _____ on this _____

day of _____ 20_____.

Witnesses:

1. _____

Signature: _____

Capacity: _____

2. _____

On behalf of: _____

Address: _____

C1.7 PRO FORMA: MONTHLY LABOUR REPORT

for

CERTIFICATE OF PAYMENT NO: _____

JOBS CREATED

As per Business Plan

A	B	C	D	E	F	G	H	I	J
Category	Number of persons employed in category	Rate (R/d)	Local P-days	Non-local P-days	Total P-days (D +E)	Amount expended on labour (C x F)	P-days by women	P-days by youth	P-days by disabled
Clerical									
Managerial									
Supervisory									
Skilled									
Semi-skilled									
Unskilled									
All occupations									

Actual to date

A	B	C	D	E	F	G	H	I	J
Category	Number of persons employed in category	Rate (R/d)	Local P-days	Non-local P-days	Total P-days (D +E)	Amount expended on labour (C x F)	P-days by women	P-days by youth	P-days by disabled
Clerical									
Managerial									
Supervisory									
Skilled									
Semi-skilled									
Unskilled									
All occupations									

Summary

Planned person-days target (see cell F8 of Business Plan):

Tendered construction period (months):

Overall person-days target per month:

Months represented by this report:

Person-day target for this month:

Achieved person-days to date (see cell F8 of Actual):

Person-days ahead/behind target:

C1.8 PRO FORMA: FORM of GUARANTEE

GUARANTOR DETAILS AND DEFINITIONS

“Guarantor” means:

Physical address:

“Employer” means:

“Contractor” means:

“Employer’s Agent” means:

“Works” means:

“Site” means:

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

“Contract Sum” means: The accepted amount of R..... (inclusive of value added tax)

Amount in words:

“Guaranteed Sum” means: The maximum aggregate amount of R.....

Amount in words:

Type of Performance Guarantee: *Variable or Fixed*

“Expiry Date” means: *insert date* or any other later date set by Contractor and/or Employer provided such instruction is received prior to the Expiry Date as indicated here.

CONTRACT DETAILS

In accordance with the provisions of the Contract, the Employer’s Agent issues monthly payment certificates and a final payment certificate upon Completion of the Works.

1. VARIABLE PERFORMANCE GUARANTEE

- 1.1 Where a Variable Performance Guarantee has been selected, the Guarantor's liability shall be limited during the following periods to diminishing amounts of the Guaranteed Sum as follows:
 - 1.1.1 From and including the date of signing the Performance Guarantee up to and including the date of the payment certificate certifying, for the first time, more than 50% of the Contract Sum:
R
(Amount in words)
 - 1.1.2 From the day following the date of the said payment certificate up to and including the Expiry Date, or the date of issue by the Employer's Agent of the certificate of Completion, whichever occurs first:
R.
(Amount in words)
- 1.2 The Employer's Agent and/or the Employer shall advise the Guarantor in writing of the date on which the interim payment certificate certifying, for the first time, more than 50% of the Contract Sum, has been issued and the date on which the Certificate of Completion of the Works has been issued.

2. FIXED PERFORMANCE GUARANTEE

- 2.1 Where a Fixed Performance Guarantee has been selected, the Guarantor's liability shall be limited to the amount of the Guaranteed Sum.
- 2.2 The Guarantor's period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of issue by the Employer's Agent of the certificate of Completion or the date of payment in full of the Guaranteed Sum, whichever occurs first.
- 2.3 The Employer's Agent and/or the Employer shall advise the Guarantor in writing of the date on which the certificate of Completion has been issued.

3. CONDITIONS APPLICABLE TO VARIABLE AND FIXED PERFORMANCE GUARANTEES

- 3.1. The Guarantor hereby acknowledges that:
 - 3.1.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;
 - 3.1.2 its obligation under this Performance Guarantee is restricted to the payment of money.
- 3.2. Subject to the Guarantor's maximum liability referred to in 1.1 or 2.1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 3.2.1 to 3.2.3:

- 3.2.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Employer's Agent in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 3.2.2;
- 3.2.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 3.2.1 and the sum certified has still not been paid;
- 3.2.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 3.2.
- 3.3. Subject to the Guarantor's maximum liability referred to in 1.1 or 2.1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:
- 3.3.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 3.3; or
- 3.3.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 3.3; and
- 3.3.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.
- 3.4. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 3.2 and 3.3 shall not exceed the Guarantor's maximum liability in terms of 1.1 or 2.1.
- 3.5. Where the Guarantor has made payment in terms of 3.3, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.
- 3.6 Payment by the Guarantor in terms of 3.2 or 3.3 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
- 3.7 Payment by the Guarantor in terms of 3.3 will only be made against the return of the original Performance Guarantee by the Employer.

- 3.8 The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
- 3.9 The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
- 3.10 This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 1.1.2 or 2.2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
- 3.11 This Performance Guarantee, with the required demand notices in terms of 3.2 or 3.3, shall be regarded as a liquid document for the purposes of obtaining a court order.
- 3.12 Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate’s Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate’s Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of Magistrate’s Court.

Signed at

Date

Guarantor’s signatory (1)

Capacity

Guarantor’s signatory (2)

Capacity

Witness signatory (1)

Witness signatory (2)

PART C2: PRICING DATA

<u>SECTION</u>	<u>DESCRIPTION</u>
C 2.1	Pricing Instructions
C 2.2	Bill of Quantities
C 2.3	Day Work Schedule

C2.1: PRICING INSTRUCTIONS

The measurement and payment clauses of the SANS 1200 Standardized Specifications and the Standard and Particular Specifications shall be deemed to form part of and included in the Pricing Instructions.

PREAMBLE TO BILL OF QUANTITIES

General

- 1 The Tender Data, the Contract Data, the Scope of the Work and the Site Information are to be read in conjunction with the Bill of Quantities.
 - a) The Bill of Quantities comprises items covering the Contractor's profit and costs of general liabilities and of construction of temporary and permanent Works.
 - b) The Tenderer is at liberty to insert a rate of his own choosing for each item in the Bill but his attention is drawn to the fact that the Contractor has the right, under various circumstances, to payment for additional works carried out and that the Engineer is obliged to base his assessment of the rates to be paid for such additional work on the rates inserted in the Bill.
 - c) The measurement and payment clauses of each Specification, read together with the relevant clauses of the Specification Data, set out what ancillary or associated activities are included in the rate for the operations specified.
- 2 The Bill of Quantities has been drawn up generally in accordance with the latest issue of the SANS 1200 Standardized Specifications. Descriptions in the Bill are abbreviated and must be read in conjunction with the measurement and payment clauses of the applicable Specifications.
- 3 Unless otherwise stated, items are measured net in accordance with the Drawings, and no allowance has been made for waste.
- 4 Except that they shall not include Value Added Tax (VAT), the prices and rates to be inserted in the Bill of Quantities are to be the full inclusive prices to the Employer for the work described under each item. Such prices shall cover all costs and expenses that may be required in and for the construction of the work described and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based.
- 5 A price or rate is to be entered against each item in the Bill of Quantities, whether the quantities are stated or not. An item against which no price is entered will be considered to have a price or rate of R0,00.
- 6 The Tenderer must price and extend each item, total each page and carry the total of each section in the Bill of Quantities to the Summary page.

Construction

- 7 Attention is drawn to Clause 6.7.1 of the General Conditions of Contract and the Contractor must not order the quantities of materials stated in the Bill of Quantities until he has confirmed from the construction drawings or measurement on Site that such quantities are in fact the correct quantities.

C2.2: BILL of QUANTITIES

WORK SCHEDULE

The Tenderer must insert in this Day Work Schedule the percentages which he proposes to claim for labour and on the actual nett cost of materials and must state the rates for the use of such Construction Equipment as he proposes to have available upon the Site to use for day work. (See Clause 6.5.1 of the General Conditions of Contract).

The labour and materials percentages, and rates of hire quoted will be held to include for all items as detailed in Civil Engineering Quantities 1990, Chapter 8 Sub-clauses 8.3 and 8.4.

Rates for the use of Construction Equipment must be the overall charge, excluding VAT, to the Employer.

(a) Labour:

Percentage allowance on gross remuneration of workmen actually engaged _____%

(b) Material:

Percentage allowance on nett cost of materials delivered on Site _____%

(c) Construction Equipment:

Construction Equipment: (insert details)	Hourly rate (Excluding VAT)	
	R	C

Date: _____ Signed on behalf of the Tenderer: _____

- NOTES:** (i) If the percentage allowances are not stated by the Tenderer in (a) and (b) above, or in the Contract Data, the percentages will be held to be:
 15% on the gross remuneration of workmen actually engaged,
 15% on the nett cost of materials.
- (ii) Payments under Items (a) and (b) above will not be subject to price adjustment, but payments based on the rates under Item (c) will be adjusted in terms of Clause 6.8.2 of the General Conditions of Contract.

SPECIAL CONDITIONS OF BID

- 1.1 Only service providers that are registered on the Central Supplier Database will be considered for this bid and a copy of CSD report printed after the date of advertisement must be attached.
- 1.2 Price(s) quoted must be firm, exclusive of VAT and other taxes.
- 1.3 Validity period is 120 days from date of bid closure.
- 1.4 No tenders shall be considered from persons who are in the service of the state unless approval is attached.
- 1.5 Attached a bank account confirmation letter with bank stamp not older than three months accompanied with an affidavit confirming the business bank account details - if the banking details are not verified on the CSD report.
- 1.6 Attached original certified copy of identity documents (ID) of company directors.
- 1.7 Provide original copy of the company registration certificate issued by the Companies and Intellectual Property Commission (CIPC).
- 1.8 valid COIDA registration certificate.
- 1.9 Proof of registration with CIDB for a grading work class of minimum **9CE**, in case of a Joint Venture, submission of a joint CIDB will be required.
- 1.10 Signed Joint Venture or Consortium Agreement if applicable
- 1.11 All bid documents must be dully signed and submitted on the PDF document that has been issued and reproduced documents will be rejected.
- 1.12 Attendance of compulsory briefing session is required.
- 1.13 The Bill of Quantities must be fully completed.
- 1.14 The company profile must be attached.
- 1.15 The public liability insurance must to be attached.
- 1.16 This bid and all contracts will be subject to the General Conditions of Contract issued by the National Treasury
- 1.17 The Department and appointed Service Provider will sign a Contract of Service upon appointment.
- 1.18 The Service Provider should commence rendering services to the Province and place from the date as agreed with the Department after receiving the letter of appointment and signed the Contract of Service.
- 1.19 Copyright in respect of all documents and data prepared or developed for the purpose of the project by the Service Provider shall be vested in the Department
- 1.20 The successful Service Provider agrees to keep all records and information of, or related to the proposal confidential and not discloses such records or information to any third party without the prior written consent of the Department
- 1.21 The Department reserves the right to terminate the Contract in the event that there is clear evidence of non-performance and non-compliance with the Contract.
- 1.22 The short-listed Service Provider may be required to do a presentation in person to the Department, at their own cost, should it be deemed necessary to do so.
- 1.23 The department reserves a right NOT to appoint any service provider if it deems fit that the bid is non-responsive.
- 1.24 The department reserves the right to arrange contracts with more than one contractor.
- 1.25 The department reserves the right not to appoint if it deemed this Bid non responsive.
- 1.26 The Department reserves a right to appoint more than one service provider.
- 1.27 No bidder will be appointed with a Non-Compliant Tax status
- 1.28 The Department reserves the right to appoint service provider(s) on the agreed negotiated rates.
- 1.29 Where required documents must be certified- Copy of a certified copy will not be accepted

MPUMALANGA PROVINCIAL GOVERNMENT



PROVISION OF BULK MUNICIPAL SERVICES IN KAMHLUSHWA EXTENSION 2 & 3 IN NKOMAZI LOCAL MUNICIPALITY

TENDER NUMBER: COGHSTA/020/26/MP

EMPLOYER:

ENGINEER:



HEAD OF DEPARTMENT

Dept. of Co-operative Governance Human Settlements,
and Traditional Affairs
Private Bag X11328
Nelspruit, 1200
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PEROZZ CONSULTING ENGINEERS

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Tender Document Book 2 of 2 (Technical Specifications)

PLEASE READ CAREFULLY BEFORE COMPLETING DOCUMENT.

1. Notice to all tenderers.
2. Standards applied in this document.

1. NOTICE TO ALL TENDERERS

This is an original document:

1. It may not be re-typed or altered in any way.
2. It must be completed in black ink – in an eligible handwriting.
3. It may not be taken apart.
4. It is not available in electronic format except PDF.
5. It is compulsory to attach required documents to the relative page (where requested). Any other form of presentation (loose pages or separate documents) will not be accepted.

2. STANDARDS APPLICABLE TO THIS DOCUMENT

Available from the S.A. Federation of Civil Engineering Contractors, the S.A. Institution of Civil Engineering, and the S.A. Bureau of Standards, as applicable:

1. CIDB *CIDB Standard for uniformity in Construction Procurement, 10 July 2015, as amended.*
2. SANS 10845-1 *Processes, methods and procedures.*
3. SANS 10845-2 *Formatting and compilation of procurement documentation.*
4. SANS 10845-3 *Standard conditions of tender.*
6. "General Conditions of Contract for Construction Works, Third Edition (2015) issued by the South African institution of Civil Engineering.
7. SANS 1200 Standardized Specifications for Civil Engineering Construction
8. This Document, as presented.

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C3.1: DESCRIPTION of WORKS

C3.1 DESCRIPTION OF WORKS

C3.1.1 Employer's Objectives

The Employer's objective is to improve the living standard in the Kamhlushwa Ext 2 & 3 in Nkomazi Local Municipality. The following is thus proposed:

BULK WATER SUPPLY

- *315mm dia.uPVC class 16*
- *250mm dia.uPVC class 16*
- *160mm dia.uPVC class 16*
- *110mm dia.uPVC class 16*
- *Elevated Steel Tank (1000kl)*
- *Command Reservoir (10ML)*

BULK SEWER LINE

- *200mm dia. uPVC class 16*
- *250mm dia.uPVC class 34*
- *315mm dia.uPVC class 34*
- *Guardroom And Operator Room*
- *Sewer Lift Pumpstation*
- *Electro-Mechanical Works*
- *Generator*
- *Concrete Pallisade Security Fencing Around Pump Stations (2.4m High)*

ROADS

- *Bus Routes 12,5 km total long*
- *Access roads 2,5km total length.*
- *Longitudinal piped stormwater drainage system*
- *Concrete lined stormwater V drains,chutes,drifts*
- *Box and pipe culverts at stream crossings*

It is a specific goal of this project that the labour component be maximised where it is economically feasible, and that the use of this labour goes hand in hand with on-the-job training of the labour force. The project is thus process and product orientated, and it is expected that the contractor will pursue these goals in the execution of the project.

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.

C3.1.2 Overview (Civil Works)

General Activities

The works will comprise of the following main categories:

- **Earthworks**

Excavate and backfill for structures, foundations, pipelines, manholes, cables etc.

- **Concrete Work**

Blinding, mass concrete, reinforced concrete foundations for structures and buildings, reinforced concrete floors, wall and other structures.

- **Pipe work**

Delivery pressure pipelines, structure inter-connection pipelines and sludge/backwash pipelines.

Building Work

Complete Super structures in brick work to isolation valves etc

Road Works and stormwater drainage

Road layer works, and stormwater drainage. Install V drains and stormwater pipes

Bulk Pipeline

This contract covers the Civil Engineering Work to provide a Bulk Pipeline. The works will comprise of the following main categories:

- Earthworks
- Pipe Trenches
- Pipelines
- Pipe Fittings
- Miscellaneous Work

Sewer Lift Booster Pump Station

This contract covers the Civil Engineering Work to provide a Lift Booster Sewer Pump Station. The works will comprise of the following main categories:

- Earthworks
- Concrete Work
- Pipe work
- Building Work
- Miscellaneous Work

Mechanical and Electrical Works

This contract covers the supply, delivery, installation, testing, commissioning and maintaining during the defect's liability period of the Mechanical and Electrical and automation equipment required for the works. The basic preferred design is provided.

The Mechanical and electrical works will be mainly concentrated at the sewer pump station and steel tank.

C3.1.3 Extent of Works

A brief detail of the works for which this specification is applicable is as follows:

The work to be executed under this contract includes, inter alia, for the supply of all prescribed materials, the plant and labour involved for the construction of the following, and not limited to the same:

1. Site Clearing and grubbing
2. Pipe trench excavation by hand or mechanical means (where required)
3. Pipe Laying and testing.
4. Earthworks for concrete structures.
5. Construction of concrete structure
6. Steel tank(1ML) and Command Reservoir (10ML)r
Roads and Stormwater
7. Sewer Lift booster Pump Station

Labour Intensive Construction

Labour Intensive Construction shall mean the economically efficient employment of as great a portion of labour as is technically feasible to produce a standard of construction as demanded by the Specifications with completion by the Due Completion Date, thus the effective substitution of labour for equipment.

Appropriate portions of the Works included in the Contract shall be executed using Labour

Intensive Construction methods.

Except where the use of plant is essential in order, in the opinion of the Engineer, to meet the specified requirements by the Due Completion Date, the Contractor shall use only hand tools and equipment in the construction of those portion(s) of the Works that are required in terms of these Project Specifications to be constructed using Labour Intensive Construction methods.

These portions of the Works shall be constructed utilising employed labour and/or the labour of local sub-contractors, supplemented to the extent necessary and unavoidable by the Contractors key personnel as provided for in sub-clause C3.3.3 unless otherwise instructed by the Engineer and in accordance with the further provisions of the relevant sections of Portion B of the Project Specifications.

The portions of the Works to be executed using Labour Intensive Construction methods are:

- Clearing and grubbing of the Site;
- Excavation for structures up to 1,5 m deep;
- Bedding, selected fill, backfilling and compaction of all pipe trenches irrespective of depth, but assisted by mechanical compaction equipment in order to achieve the specified densities;
- Transportation and spoiling of all trench materials, where the disposal site is located within 20 meters of source;
- Cleaning and tidying up of the Site;
- Construction of all brickworks required for structures;
- Mixing and placing of concrete work;

In respect of those portions of works which are not listed above, the construction methods adopted and plant utilised shall be at the discretion of the Contractor, provided always that the construction methods adopted and plant utilised by the Contractor are appropriate in respect of the nature of the Works to be executed and the standards to be achieved in terms of the Contract.

Where indicated, the Mechanical and/or Electrical contractor shall supply all fittings and fixtures, to be built in by the Civils Contractor in line with the Civil Contractor's program. In certain cases, the Civils Contractor will provide box out to allow for specials and pipe-work to be installed at a later stage. The Mechanical and/or Electrical contractor will be responsible for the size and location of the box out including the grouting or supervision after installation.

Trenching and installation of all underground pipelines will be carried out by the Civils Contractor. The Mechanical and/or Electrical contractor will be responsible for cable trenching and installation and will be expected to liaise with the Civils Contractor should common trenches be required. Liaison with other contractors is the responsibility of the relevant contractor through the Engineer and his representatives on site at no additional cost to the employer.

C3.1.4 Location of the Works.
The proposed township development is situated next to Kamhlushwa A with grid reference 25°40'36.07"S; 31°41'15.70"E

C3.1.5 Construction program

Each Tenderer shall submit with his Tender a suitable and realistic preliminary construction programme (referred to as the Tender Programme) for consideration by the Engineer and based on the maximum Time for Completion (36 Months) specified in the Conditions of Contract or offered by the Contractor. This programme shall indicate interim completion dates for each milestone or element of the works, including the installation of pipes, any equipment, testing, commissioning and the 4-week Trial Operation Period. The programme shall be sufficiently detailed to differentiate between the various activities so that the contract may be properly evaluated.

Within 14-days after award of a Contract, the Contractor shall submit a detailed construction programme (Gantt-type on MS Project) to the Engineer in accordance with the requirements of Sub-Clause 5.6 [Programme] of the General Conditions of Contract. Except as provided above, the approval by the Engineer of the Contractor's construction programme, or of any amendment or adjustment thereto, shall not in any way alter the Contract, act as an estoppel or limit the right of the Employer to demand due performance under the Contract.

The approval of a construction programme by the Engineer indicates only that the Engineer will be satisfied if the work is carried out according to such programme and that the Contractor undertakes to carry out the work in accordance with the programme. However, the approval of a construction programme by the Engineer shall not limit his right to give notice to the Contractor to submit a revised programme if the existing programme fails to comply with the Contract.

Construction methods must be of such a nature that no property or life is endangered. The Employer accepts no responsibility for work that is done outside the Site boundaries without the Engineer's approval.

The compilation of the construction programme and any amendments thereto during the course of construction shall be at the cost of the Contractor and shall not be measured elsewhere in this Contract.

C3.1.6 Change in works

The Engineer may, from time to time by order in writing without in any way vitiating the Contract or giving to the Contractor any claim for additional payment, require the Contractor to proceed with the execution of the works in such order as in his opinion may be necessary, and may alter the order of or suspend any part of the Works at such time and times as he may deem desirable and the Contractor shall not, after receiving such written order, proceed with work ordered to be suspended until he shall receive a written order to do so from the Engineer. Where the work must of necessity be carried out in conjunction with work of other Contractors, or with that of the Employer, it shall be co-ordinated and arranged in such a manner as to interfere as little as possible with the progress of such other work so as to offer every reasonable facility to other Contractors or to employees of the Employer.

C3.1.7 Community Liaison Officer

The Contractor in consultation with the Employer and PSC shall appoint a Community Liaison Officer. His/Her role will be to liaise between the contractor, labourers, community and the PSC. The Contractor will pay his remuneration, and a provisional sum has been provided for this expenditure. The CLO will assist in the recruitment of labour, based on recommendations by the PSC. The CLO must manage a labour desk and submit a written report on the status of the project at every site meeting.

C3.1.8 Training and Training Programs

The contract provides for extended structured training programmes by accredited trainers for specific accredited programmes inside a given budget as identified by the Engineer.

Apart from training modules in the civil engineering industry supplemented by training on site by the contractor, capacity-building courses will be arranged and monitored on site.

C3.1.9 Temporary Works

This refers to works that are required to facilitate the execution of the Permanent Works of the contract and shall include items that will not be permanently built into the works.

Typical examples of "Temporary works" is the provision of access to the site of the Works in form of ramps into excavations for the purpose of deploying labour and plant at the positions required. "Temporary works" shall also include all measures to control water particularly in excavations by creation of temporary dewatering sumps and trenches.

It is a requirement that the Contractor pays particular attention to the relevant specifications that will be detailed for the control of water in conjunction with his own methodology and

include costs for such works in his rates. Water control is an ongoing exercise to avoid flooding of the site and or excavations including during non-working hours and should be maintained at all times until safe.

The Engineer is entitled to withhold payments if in his opinion the Contractor is failing to provide and operate adequate facilities for the control of water which may adversely affect certain portions of the permanent works.

“Temporary works “does not include activities or facilities such as the provision of accommodation for the Contractor and Engineer, temporary water and power supplies and all things necessary to complete the Works specified and/or shown on the drawings and scheduled in the Bill of Quantities.

All “Temporary works” which will have been approved by the Engineer shall be removed by the Contractor on completion of the works. The Contractor will be responsible for making good any damages that may have resulted from such works and will require Engineer’s approval for the remedial works.

C3.2: ENGINEERING

Although not bound in nor issued with this Document, the following Standardised Specifications shall form part of the Contract Document:

C3.2 ENGINEERING

C3.2.1 DESIGN

Although the Engineer has designed the Permanent Works as shown on the Drawings and has selected Plant and Materials that are deemed suitably sized for the purposes of Works, the Contractor shall be responsible for the detail design of all propriety materials and plant in order to ensure these are appropriately selected, specified and installed to meet the particular installation conditions on Site. This requirement shall be specifically applicable to any/all items of a mechanical and electrical nature included in the contract e.g. filter floors, piping systems, chemical dosing systems, pumping systems and electrical distribution and instrumentation.

Description	Responsibility
Design of Works	Engineer
Concept, feasibility and overall process	Client
Basic Engineering and detail layouts to tender stage	Engineer
Final Design of Works	Engineer
Final Design to approved for construction stage	Client
Preparation of tender documentation	Engineer
Appointment of sub consultant	Client
Appointment of sub-contractors	Contractor
Supervision	Engineer
Preparation of as-built drawings	Contractor / Engineer
Completion certificate	Engineer / Client / Contractor

C3.2.2 CONTRACTOR'S DESIGN

Contractor's Design and Drawings (Civil Works)

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

The Engineer will provide General Arrangement drawings (GA) for interconnecting pipework and structural steelworks which will be fabricated by the Contractor. The Engineer will provide relevant details like alignment, diameters, classes, pipe material thicknesses and required coatings for the pipework. However, the Contractor shall be responsible for all final measurements on site, final design, correct manufacturing and installation of all pipe items and specials to suit the installation.

The Contractor is responsible for the production of shop detail drawings for all fabricated structural steelwork required under the Contract including the design and detailing of connections. The Contractor is responsible for the production of detailed pipe schedules for all interconnecting fabricated steel pipework.

The Contractor will submit to the Engineer for approval all drawings, details and schedules prior to commencement of fabrication. Approval will be strictly in writing and Contractor should retain the original approval throughout the duration of the contract. Any/all modifications on site shall be handled in terms of the relevant Specifications for repairs to damaged corrosion protection. The Contractor shall also maintain suitable records of all such items in order for the Engineer to complete the as-built drawings at the completion of the works.

Contractor's Design and Drawings (Pumps)

The Contractor shall be responsible for the design of his proposed equipment and systems. All design shall be carried out in accordance with good engineering practise, based on the specification and types of materials specified in the tender document. The Engineer may approve the designs and plans provided by the Contractor without exempting the Contractor's responsibility. The Contractor shall have in his team the services of a professional engineer/s who will provide the professional responsibility for the designs.

All designs by the Contractor shall be modern and capable of delivering the specified duties effectively while remaining serviceable for the design period specified. The Contractor shall ensure that all equipment provided and installed shall be of the best and of robust construction which complies with all specifications in the relevant categories. The Engineer will check for such compliances and will require submission of test certificates prior to approval of any installations.

C3.2.3 Alternative offers

The Contractor shall complete the tender in terms of the information provided and requested in the tender document. Failure to complete the tender document, including the schedule of quantities, may lead to the rejection of the bid.

Alternatives may be proposed for sections of the Works. These alternatives will be considered in the adjudication of the bids. If alternative mechanical proposals are submitted the electrical scope must be adjusted to allow for the complete mechanical change as part of the alternative offer.

In evaluating tenders received, and in accordance with its adopted procurement policy, the Employer is required to satisfy itself as to the competitiveness and cost effectiveness of each tender received. In addition, as a public entity, the Employer is required to ensure that its procurement process is fair, equitable and transparent at all times. Accordingly, except for alternatives requested in the tender documents, any tenderer wishing to submit (an) alternative offer(s) for the consideration shall ensure that the competitiveness and cost effectiveness of the alternative can easily be determined. Bids that are difficult to compare to the prescribed condition of tender and contract and/or to the specified technical requirements are likely to be rejected. Even if comparable, a tender that deviates from the specified conditions or requirements may not be acceptable for reasons of risk apportionment or otherwise. Tenderers are therefore instructed to price the specified requirements and schedule of quantities before submitting any alternative offer for the Works.

Acceptance of an alternative proposal or offer shall not relieve the Contractor of any of his obligations in terms of the Contract. The Contractor's cost of preparation and sub-mission of an alternative proposal shall be deemed to be included in the rates as quoted for the execution of the Work.

C3.2.4 DRAWINGS

The following drawings are bound into this document to provide an overview of the scope of works.

Civil Engineering drawings

- Water layout drawings
- Water typical drawings
- Sewer layout drawings
- Sewer long section profile drawings
- Sewer typical drawings
- Road and stormwater layout drawings
- Road long section profile drawings
- Typical road drawings
- Typical stormwater drawings
- Pumpstation Drawings,
- Steel Tank

The Engineer will provide the Contractor with two full set of drawings, which one set will be used exclusively for the recording of as built information by the Contractor.

Only dimensions, positions, levels, co-ordinates etc. that change from the original values, will be required to be entered on these drawings. These drawings, fully marked up, will be handed to the Engineer at the issue of the Certificate of completion, which will not be issued until the as-built information has been received.

C3.2.5 CONSTRUCTION DRAWINGS

Construction drawings will be issued to the Contractor by the Engineer/Employer on the commencement date and from time to time as required.

C3.2.6 DESIGN PROCEDURES

All designs and modifications thereto shall be communicated in writing and the contractor and engineer shall maintain master lists to record and track all transactions.

It should be assumed that all structure foundation construction is the responsibility of the Civils Contractor under the civils contract. This will include the construction of the buildings to accommodate the mechanical and electrical plant. However, the Contractor may be required to make provisions or construct specific components in accordance to his requirement under this contract.

The following are procedures that will generally be followed and applicable to this contract:

C3.2.6.1 DATA SUBMITTED AT TENDER STAGE AND PRELIMINARY DESIGN BASIS

The Contractor shall ensure that all Data Sheets are filled in including any additional sheets and submitted with his tender. Tender drawings, approved alterations and drawings including explanatory diagrams shall be bound in the tender document and will be deemed to form the basis of the final approved design.

Drawings shall be concise, showing all dimensions, scale and supporting structures. Details such as required openings, space requirement and material type and class/grade shall be shown on drawings.

The Contractor is expected to have attended the site inspection and briefing session and to have spent adequate time familiarising with all site conditions that may affect delivery, storage handling, installation, commissioning and maintenance of the plant.

C.3.2.6.2 COMPLIANCE WITH REGULATIONS

All equipment including temporary works and construction equipment must comply with the requirements of the Machinery and Occupational Safety act, 1983 and any other specific requirements detailed in this document. Tendered rates must include the cost of compliance with all the regulations and for any additional works or alterations that may be instructed or become necessary for full compliance.

C.3.2.6.3 CONSTRUCTION STAGE DATA AND DRAWINGS

The Contractor will be required to provide the Engineer with the information listed below within 4 weeks of contract award and acceptance.

- Detailed drawings of the Works to be constructed in hard and soft copy format.
- Any necessary modifications to the civils details required.

- Confirmation of the foundations, columns and bases, bolt holes and any other special features that will affect the civil works.
- The full list of all pipe-work and specials that are to be cast in by the Civils Contractor including the dates of when such will be available.

This information will be used by the Engineer to cross reference with the Civils Contract program and ensure that there is liaison between this and the Civils contract.

Any cutting or alteration of Structural work arising from inadequate or incorrect dimensions and particulars afforded by the Contractor, or through late receipt of such particulars, will be arranged by the Engineer to be carried out at his discretion at the expense of the Contractor under his Contract.

Reference is made to "Part C1 - Agreement and Contract Data" for this section

C.3.2.6.5. TESTING, COMMISSIONING AND ACCEPTANCE

The Contractor shall be responsible to commission all equipment that he will have installed and demonstrate to the Employer and Engineer its readiness for use.

An agreed period of hand over/acceptance over a period of not less than 5 working days will apply. During this period the installations will be thoroughly inspected, tested and operated under normal conditions to the satisfaction of the Engineer prior to the acceptance. The handover and testing period forms part of the overall works period and should be programmed as such

Costs incurred by the Engineer for all unsuccessful acceptance tests shall be borne by the Contractor.

Only on successful completion of the handover inspection and testing period will a certificate of commissioning be issued and the guarantee period commences. The Contractor shall supply all manuals and 'As Built' details prior to receiving the commissioning certificate and release of the appropriate portion of the retention monies.

Notwithstanding any requirement of the General Conditions of Contract, the following tests on completion shall be executed by the contractor:

1. Dry testing as part of construction

Once the construction of the Works or a Sub-section has reached the stage of completion where it can be tested, the Contractor shall give to the Employer notice of the date at which the Contractor will be ready to carry out the Dry Commissioning of the Works or any Sub-section thereof. Dry Commissioning shall commence as soon as the Works or a Sub-section is mechanically and electrically ready to test, it shall undergo pre-commissioning tests and inspections to check the following general aspects: -

- Components of the Works or Sub-section are complete and comply with the Drawings, Specifications and data as indicated in the manufacturer's documentation;
- The assembly has been carried out in compliance with the above documents and professional practice;
- Visual checking of general installation and appearance.

In addition, dry commissioning shall include the following specific aspects:

- Thorough check of all ergonomic (lighting and noise), maintainability and safety related aspects;
- Thorough check of flow lines of products, materials, fluid, and compressed air;

- Thorough check of electrical, hydraulic, pneumatic and electromechanical circuits;
- Thorough check of all functional and control loop tests (equipment level);
- Dry-run of every machine and checking of its operation and, if necessary, running in;
- Calibration checks and supporting documentation on all metering and monitoring equipment;
- Dry-run or no-load run of every section;
- Fixing of equipment, pipes, brackets, anchors, etc.;
- Written proof of all direction testing and alignment tests on pumps, motors and rotating equipment;
- Statutory testing requirements (Lifting, hoisting, pressure vessels etc.);
- Checking and testing of all actuators, valve and control valve settings;
- Water testing of chemical dosing equipment, pipes, joints;
- Water tightness and pressure tests on all water retaining structures, pressure vessels, pipelines and pipe fittings;
- Visual checking of general appearance and equipment labelling;
- Checking of all terminations;
- Verify correctness of field equipment statuses in relation to PLC and SCADA displays (if applicable);
- Testing of low voltage cables;
- Testing of high voltage cables;
- Checking of all safety settings;
- Directional testing of rotating elements;
- General safety of installations;
- Signals and SCADA/MMI configuration;
- Completion and issuing of all test reports and test certificates;
- Completion of cathodic and lightning protection;
- Compilation of an asset register suitable for integration with the Financial and Computerised Maintenance Management system of the Client;
- Completion and issuing of all equipment and O&M manuals including functional specifications and control philosophy;
- Supply of all critical spares and special tools on site;
- Check that first charge of chemicals has been delivered.

2. Wet commissioning and testing as part of construction

Once the dry testing of all equipment in terms of the above has been completed, each process and system will be wet commissioned, which shall include the same operations as for dry commissioning tests but with the equipment loaded. The Employer will provide suitable raw water and power as set out by the Contract. The Contractor shall provide the first charge of chemicals for testing purposes. Wet commissioning shall entail the following:

- Performance testing of all equipment at specified duties and efficiencies for at least 24 hours continuously;
- Checking of levels, flows, pressures and temperatures at minimum and maximum operating conditions for all operational scenarios;
- Temperatures of all bearings;
- Vibration of rotating elements;
- Calibration of dosing equipment;
- Water tightness tests of installations at full production;
- Functional and control loop testing (process level);
- Site performance tests on individual equipment as per the testing plan;
- Performance and control tests on the entire system;
- Performance testing of sludge dewatering plant, inclusive of any/all sampling and analyses as per the Specifications.

After successful completion of the Wet Commissioning of all equipment and processes and the Works as a whole, the Trial Operation Period as defined below shall commence.

3. Trial Operation Period

After successful completion of the wet commissioning phase and submission of the draft Operation & Maintenance manuals in the pre-scribed format, a 3-Months Trial Operation Period shall commence during which the new treatment module shall be operated under the auspices of the Contractor. The Contractor shall provide full-time attendance for the duration of the Trial Operation Period during normal working hours (07h00 to 18h00) and shall have an individual(s) on standby during non-working hours for any/all emergencies.

The purpose of the Trial Operation Period is to (a) prove the functionality of all mechanical and electrical equipment installed under the Contract, to (b) do final adjustment and optimization of relevant operational settings and to (c) prove the improvement and ultimate compliance of the final effluent.

The Trial Operation Period shall be declared successful if/when the plant operates as intended without any mechanical and/or electrical failure for a continuous period of 12(No) consecutive weeks, at which time the Taking-Over Certificate shall be issued signifying the start of the 12-month defects liability and maintenance period.

C.3.2.6.6 FINAL COMPLETION

This will be when all works in terms of the contract has been completed. A certificate of Completion will be issued following a satisfactory inspection by the Employer, Engineer and the Contractor.

C.3.2.6.7 MAINTENANCE AND OBLIGATIONS

The Contractor shall maintain all equipment provided in a good working order during the defects liability period. The defects liability period shall commence on the day following final completion.

The Employer reserves the right to undertake any emergency repair work during the defects liability period without the prior consent of the Contractor. The Engineer has the right to decide whether an emergency exists and shall notify the Contractor accordingly. Should this emergency repair work be caused by poor materials, faulty workmanship or neglect of the part of the Contractor, the Employer may deduct the cost of the repair work from the outstanding retention money owing the Contractor.

After satisfactory completion of the guarantee period, the final certificate shall be issued, and all retention money released.

C.3.2.6.8 OPERATIONS AND MAINTENANCE MANUALS

Three (3) hard copies of comprehensive operations and maintenance instructions in file format shall be supplied by the Contractor. Three (3) hard copy sets of appropriately sized drawings and a further editable soft copy on CD for the "As Built" drawings shall be supplied.

All manuals shall be supplied prior to hand-over/acceptance of equipment. The completion certificate shall not be issued nor shall the corresponding payment be made until the above manuals and drawings have been supplied.

Operating instructions shall include:

- Index
- Pre-start check list;
- Step-by-step description of the approved procedures for all modes of operation of equipment;
- Description of required safety checks.

Maintenance manuals shall include:

- Index
- Details of routine and regular maintenance work which the manufacturer considers necessary to maintain in satisfactory running order;
- Instructions for the repair or replacement of worn or damaged parts;
- Schedules of routine of electrical equipment (as recommended by specific suppliers);
- Spare parts list;
- Particulars technical data of equipment;
- Preference list, including local agents for the supplier and repairs of specific equipment;
- All schematic wiring diagrams pertaining to technical report.
- As built editable drawings (CAD) of the switchboard construction, wiring diagrams and functional description of the control of equipment served from the switchboard.
- As built editable drawings (CAD) of all cables referred to permanent structures as reference points for measurement.
- As built editable drawings (CAD) of all fabricated fittings and pipe work supplied and installed in the works

The Contractor shall as part of the handover/commissioning process be responsible to induct the Employer's representatives on the proper operation of the installation all to the satisfaction of the Engineer.

C.3.2.7 PUMPS

C3.2.7.1 SCOPE

This section of the Contract covers the supply, delivery, transport, handling, storage, erection, installation, commissioning, testing, adjustment, handing over in complete working order and upholding during the Defect Liability period of the following equipment.

C3.2.7.2 GENERAL

Dry well pumping equipment shall mean equipment of which pump and motor operate in non-submersible mode.

The design of the pumps shall be in accordance with KSB specifications or BS 5257.

All working parts of the pumps shall be removable and serviceable and shall under no circumstances be integrated into the body of the pumps.

Pumps shall be designed to incorporate and install transducers for the monitoring of:

- a) The vibration of the pumps, and
- b) The oil temperature of the bearing of the pumps.

C3.2.7.3 CENTRIFUGAL PUMPS

C3.2.7.3.1 General

All pumps are dry-well centrifugal pumps from KSB Omega pumps suitable for pumping potable water to the various reservoirs.

C3.2.7.3.2 Pump Layout

The pump layout is as per drawing. The tenderer shall provide full details of the proposed layout for the Engineer's consideration if an alternative is offered.

C3.2.7.3.3 Materials of construction of casing

The pumps shall be of maker's standard and approved design, low maintenance and robust.

The pumps casing shall be manufactured from high grade cast iron, rigidly secured to base plate which shall be factory galvanised corrosion protected with only touch ups allowable on site.

The casing shall be selected for a minimum of 1 000 kPa or 1.5 times the actual discharge pressure, whichever is the greater.

C3.2.7.3.4 Pump Speeds

The pumps shall have a rotational speed of 1 450 rpm/2950rpm as per supplier specifications and shall be properly balanced unless heavy duty thrust bearings are provided.

Pumps shall be self-regulating to avoid overloading the motors in cases where delivery exceeds certain limits.

C3.2.7.3.5 Pump Impellers

Only high-grade cast iron shall be used for impeller manufacture.

C3.2.7.3.6 Pump shafts

Carbon steel shall be used for the manufacture of pump shafts. Shaft balancing is critical for pumps and should be accurately affected during manufacture. All rotating elements are to be accurately balanced for noise and vibration elimination.

C3.2.7.3.7 Lubrication

Pump are to come with effective bearing lubricating system which shall be oil or grease systems depending on supplier specifications. Oil dipsticks and drain plugs shall be provided for oil lubricated pumps whilst lubricators shall be provided for greased pumps.

C3.2.7.3.8 Bearing

Pumps shall come with either ball or roller bearings as specified by the manufacturer. The manufacturer shall provide relevant bearing numbers for future replacement and indicate the appropriate bearing life which shall be detailed in the operation and maintenance manual.

C3.2.7.3.9 Couplings

Pumps and motors shall be strictly directly coupled. The coupling shall be capable of taking up minor misalignments of the shaft without differential thrust to motor or pump. The coupling shall be protected with a standard steel guard. Fenner tyre coupling guard, design to be confirmed before ordering.

C3.2.7.3.10 Pumps Motors

Pumps shall be fitted with suitably sized motors (High Performance Efficiency WEG model) as indicated in the data sheets. Motors shall comply with the relevant specifications.

C3.2.7.3.11 Base Plate and Assembly

Pumps and motors are to be priced complete with base plates.

The Civils contractor will be responsible for casting the new foundations in accordance with the Contractor's design and finish off bases approximately 20mm below the underside of the base plate including casting in of holding down bolts,

The Mechanical contractor shall then set up the pump unit and level it out with appropriate steel wedges before the Civils contractor grouts in the gap with concrete. The Mechanical contractor will be responsible for the final alignment and ensuring that noise and vibration tolerances are maintained at all times. Final alignment test to be witnessed and approved by the Engineer for radial and lateral alignment.

C3.2.7.3.12 Accessories

All pumps shall be fitted with air cocks, drain cocks and lifting eyes in line with the Occupational health and Safety Act, (Act 85 of 1993). All pumps shall be equipped with pressure gauges on the delivery and suction sides of the pumps. Pressure gauges shall be provided with isolation cocks to allow removal when not in use. Pressure gauges shall be calibrated and come with calibration certificates. The Engineer shall indicate the required range and sensitivity of each of the pressure gauges. Pressure gauges must be reasonably sized to allow for ease of reading and be dampened against vibration by suitable approved material.

C3.2.7.3.13 Air Release

The Contractor shall be responsible to ensure that air release valves are positioned at the requisite points on the delivery lines within his connections. Although minimal modifications to the pipe work is anticipated, the Contractor still has to ensure that there is no air entrapment in all his connections.

C3.2.7.3.14 Gland Sealing

All pumps shall have proper gland seals to guard against excessive leakage by the mechanical seal. Seals shall be lubricated by an approved oil-based lubrication which shall be separate from the shaft bearing lubrication. The contractor to install gland leakage water drainage pipes from both pumps to drainage sump.

C3.2.7.3.15 Pipe work

The Contractor shall provide details of all modifications that he intends to utilise for the Engineer's approval. Each pump set shall be fitted with the necessary approved pipe work, flexible couplings, valves, pipe support and bends, as shown in the drawings.

The pipe work shall be of mild steel with corrosion protection as specified and shall be flanged and drilled to SANS 1123 Table 1000/3 unless otherwise specified. Bends and branches shall provide non-turbulent flow conditions and the layout of the pipe work shall be such as to facilitate dismantling and inspection. The pipes are to be properly supported and so arranged that all stresses created in the pipeline by static and dynamic forces including recoil shock, will be taken up by suitable anchors. Unless a specific is specified, pipe work shall be sized so as to limit maximum flow velocities to 1, 5 metres per second, and less than 0.9m/s on pump inlet pipe assembly.

Grade B steel with minimum 6mm thick wall thickness shall be used for all pipes and fittings. SANS 719 shall apply for all pipes and fittings.

All suction and delivery pipe work shall be provided with a flexible coupling in a convenient position to facilitate removal and reinstallation of a pump.

All pipes specials shall be free of weld spatter and all sharp corners and edges shall be ground smooth and round before painting.

Each delivery line shall be provided with a gate valve and non-return valve if a completely new assembly is proposed. All gate valves shall be waterworks pattern as specified. Non-return valves shall be swing check reflux valve. Check valves on delivery mains shall only be used in a horizontal position.

C3.2.7.4 PUMP MOTORS

Premium Efficiency Electric Motors to be used.

All electric motors shall fully comply with the following relevant standards:

SANS 948, BS 4999 and BS 5000 or IECs 34 and IECs 72

C3.2.7.5 PARTICULAR REQUIREMENTS OF PUMPS

i) Drainage Pump (Gland Leakage) Only if required

The Contractor shall install one drainage submersible pump equipped with automatic controls (high level-on, and low level-off) is required.

The gland leakage pump shall be installed in the drainage sump within the pumpstation and be capable of discharging up to 1.5l/s over 5m head. The pump should be able to handle solids up to 20mm in diameter. The Contractor must allow for 50mm galvanized discharge pipework 10m long with elbows and fittings.

C3.2.7.6 SITE TESTING OF PUMPING PLANT

On completion of erection of the pumps and of rendering them operational, the Contractor shall make suitable arrangements to test them in the presence of Engineer. According to ISO 9906:2012 Grade 2B

Each pump shall be tested individually over its whole range of delivery. Where pumps are to operate in parallel, tests shall also be carried out to check these operating conditions.

The rate of delivery during testing shall be determined by flow meter.

During tests, the average values of voltage and current drawn motor efficiencies power factors to be recorded by approved power analyser logger. Motor efficiencies and power factors shall be used as supplied by the maker.

The Pump performance test results shall be measured against ISO 9906:2012 Grade 2B.

In the event of the pumps failing to achieve the tendered performance in regard to discharge or efficiency within the tolerance allowed, then the Employer shall have the right to reject the pumps, to recover all monies paid by the Contractor under the Contract for such pumps and to confiscate the surety by way of agreed and liquidated damages; whereupon the Contractor his own expenses shall remove all rejected plant where ordered to so by the Engineer.

C3.2.7.7 CONTROL OF PUMPS

The control of each pump is described below under the particular requirement of each pump, but all control and switchgear will be supplied and installed by a separate and installed by separate (electrical) contractor to meet the requirements of the Mechanical Contractor.

C3.2.7.8 ELECTRICAL INSTALLATION

Each pump shall be controlled by a system of level sensors, flow sensors, pressure sensors to activate the stop and start cycles. All pumps to be protected against overload, phase rotation, lightning surge and under voltage power supply. The pump control to

include HR meters, voltage meter, amp meter and trip failure pilot light. Selector switch with auto/off/manual to be allowed for each pump. Power supply will come off a new transformer within the site. All control and switchgear will be supplied and installed by a separate (electrical) contractor to meet the requirements of the mechanical contractor. The pumps to be operated with variable speed drive on each pump. The speed drive to allow the pump start/stop and adjustable operating status.

C3.2.7.9 LIFTING GEARS

The Tenderer shall provide one lifting rig, (travelling trolleys and blocks and tackle) for the clear water pump house, as detailed on the drawings.

The crawl beams for the lifting gear (254 x 146 x 37 kg/m) will be supplied and installed under another Contractor but the Contractor under this Section of the Contract shall supply and install the suitable manual operated lifting gear. Full detail of the lifting gear shall be provided with the tender. A vertical distance of 6 750mm from the crawl beam to the ground shall be allowed in the clear water pump house. Lifting capacity 3-ton safe load.

The total installation must in all respects comply with the Machinery and Occupational Safety Act and be to the satisfaction of the Engineer.

C3.3: PROCUREMENT

The Tenderers notice is drawn to the fact that the awarding of this tender will be in terms of the Supply Chain Management Policy of Mpumalanga Department of Human Settlements and The Standard Conditions of Tender as per SANS 10845-3 Construction procurement, Part 3: Standard conditions of tender

Bids received shall be evaluated in terms of the tender evaluation criteria described in the Tender Data, taking cognisance of the Employer's preferential procurement requirements as provided.

The civil portion of the works shall be executed by a suitably qualified, experienced and capable civil contractor that shall either be the main contractor or the lead partner of a Joint Venture. The mechanical portion of the works shall be carried out by a suitably qualified, experienced and capable mechanical sub-contractor with a verifiable track record with respect to projects of a similar nature. The electrical/electronic portion of the works shall be executed by a suitably and capable electrical sub-contractor with a verifiable track record with respect to projects of a similar nature.

C3.5: CONSTRUCTION

C3.5.1 STANDARD SPECIFICATIONS

C3.5.1.1 Applicable SANS 1200 Standardized Specifications

The following SANS 1200 Standardized Specifications for Civil Engineering Construction form part of the contract.

SANS 1200 A	:	General
SANS 1200 AB	:	Engineer's Office
SANS 1200 C	:	Site Clearance
SANS 1200 D	:	Earthworks

SANS 1200 DB	:	Earthworks (pipe trenches)
SANS 1200 DK	:	Gabions and Pitching
SANS 1200 DM	:	Earthworks (roads, sub grade)
SANS 1200 F	:	Piling
SANS 1200 G	:	Concrete (structural)
SANS 1200 H	:	Structural Steelwork
SANS 1200 HA	:	Structural Steelwork (Sundry Items)
SANS 1200 HB	:	Cladding and Sheetting
SANS 1200 HC	:	Corrosion Protection of Structural Steelwork
SANS 1200 L	:	Medium Pressure Pipelines
SANS 1200 LB	:	Bedding (pipes)
SANS 1200 LC	:	Cable ducts
SANS 1200 LD	:	Sewers
SANS 1200 LE	:	Stormwater Drainage
SANS 1200 M	:	Roads (general)
SANS 1200 ME	:	Sub base
SANS 1200 MF	:	Base
SANS 1200 MJ	:	Segmented Paving
SANS 1200 MM	:	Ancillary Road works

- C3.5.1.2 Variations and Additions to SANS 1200 Standardized Specifications are included in Section C 3.5.7
- C3.5.1.3 Particular Specifications are included in Section C 3.5.8
- C3.5.1.4 "General Conditions of Contract for Construction Works, Third Edition (2015) issued by the South African institution of Civil Engineering.
- C3.5.1.5 National and International Standards are applicable to this Contract wherever referred to in the Specifications.

C3.5.2 Plant and materials

All materials shall comply with the requirements of the South African National Standards and shall bear the official standardisation mark. Where SANS standard does not exist for a certain material, or a material does not bear the official standardisation mark, the Engineers approval of such material must be gained before use thereof.

C3.5.3 Construction Equipment

All equipment on site shall be in a good working order and is to be in such a condition that it can achieve production rates which are typical of the industry standards.

Should any equipment, in the opinion of the Engineer, be substandard or breaks down frequently to such an extent that it affects the progress on the project, the Engineer may instruct the Contractor to replace such equipment.

C 3.5.4 Existing Services

The Contractor shall so carry out all his operations as not to encroach on, or interfere with, trespass on, or damage adjoining lands, building properties, roads, structures, places and things in the vicinity of the Works, and he shall free and relieve the Employer of any liability that may be incurred in consequence of his failure to do so.

The services existing on the site will be either shown on the drawings or pointed out on site by Municipality. No excavation work will commence unless a representative of the Municipality has been requested to point out existing services in the area under construction. Written confirmation of services that have been pointed out by the Municipality is to be obtained by the Contractor.

All existing services on the site may not be shown on the drawings or be visible on the site. The Engineer may order excavation by hand in order to search for and expose services. An

item has been included in the Schedule of Quantities to cover the cost of such work if so ordered by the Engineer. Where a service is damaged because of the Contractor's negligence he shall be liable for the cost involved in the repair of the services and any other consequent cost that may arise due to the interruption of the damaged services.

No excavation is to take place until a representative from the Municipality has been contacted and he has pointed out the existing services to the Contractor and confirmed it in writing. The same shall apply to all services in the area.

C3.5.5 Site Establishment

▪ Source of Water Supply

Contractor is to arrange with the Local Authority for a connection point. The Contractor will be responsible for the costs of the connection as well as the use of water for construction purposes. The Contractor's attention is drawn to the fact that the potable water supply is erratic in this area. Under no circumstances may potable water be used for construction, unless written permission is granted by the Engineer.

▪ Sources of power supply

The Contractor is to arrange with the Local Authority for a connection. The Contractor will be responsible for the costs of electricity consumed as well as the connection costs.

▪ Location of camp and depot

The Municipality shall point out the position of the Contractor's camp to the Contractor during the site inspection.

▪ Sanitary facilities

The Contractor is to provide the necessary sanitary facilities at his camp, all of which will be governed by the requirements of the Local Authority. The contractor shall pay all sanitary fees and charges due.

It is required that specific sanitary facilities be provided for the Engineer. The facilities for both parties are to be kept in a clean and hygienic condition, to the satisfaction of the Engineer. All sanitary facilities are to conform to the by-laws of the Local Authority.

Items are provided in the Bills of Quantities for the provision of sanitary facilities for use by the Engineer, Contractor and his workers.

▪ Temporary offices

The Contractor is required to provide a specific office space for the Engineers as specified in section C3.5.7 (PSAB Engineers Offices).

Neither housing nor shelters will be provided for the contractor's employees, and the Contractor shall make his own arrangements to house his employees and transport them to the Site.

▪ Laboratory facilities

The use of commercial laboratories will be allowed, but the laboratory to be used is subject to the approval of the Engineer.

▪ Name Boards

Two name boards shall be provided in positions as ordered by the Engineer. The Engineer will provide the lettering required once the tender is awarded.

▪ Survey assistant and equipment

The Contractor will not be required to make any survey equipment available specifically for the use of the Engineer. The Contractor will however make 2 survey assistants

available to the Engineer as and when required, as well as the theodolite and/or level plus accessories.

C3.5.6 Site Usage

▪ Ground and access to the works

The Contractor shall where necessary on or adjacent to roads which carry traffic, provide all the necessary barricades and signs in accordance with the stipulations of the South African Road Traffic Signs Manual, and in strict accordance with the requirements of the Protective Services of the Local Municipality.

The Contractor shall further ensure that all public roads that are used for access to the site are kept free of debris at all times. The Contractor shall also take adequate measures to ensure that dust is kept to an acceptable level. The term acceptable is to be deemed as acceptable to the Engineer.

▪ Care, damage and protection

The Contractor shall at his own cost make full provision for all watching and lighting necessary for the protection of all persons, animals, vehicles, etc., from injury by reason of the Works. He shall provide ample warning signs, guard rails, etc., around open excavations, stacks of materials, excavated material, debris or the like, and he shall be held liable for all claims made upon himself or upon the Employer by reason of his neglect of all such precautions and provisions.

During the periods of construction of the Works and the repair of defects, the Contractor shall, at his own cost, to the satisfaction of the Engineer and the relevant Authority, take sufficient and adequate measures to avoid interrupting the use of all roads, footpaths, water courses, drains, pipes, telephones, electric wires and cables, premises, places and works, public or private, which may in any way be interfered with by the operations; and shall also afterwards permanently restore all structures and everything which may have been temporarily displaced or otherwise interfered with, all to the satisfaction of the Engineer and the relevant Authority, without extra charge beyond the Contract price.

▪ Survey beacons

The Contractor shall take care to safeguard any permanent survey beacons such as erf boundary pegs and reference beacons. Should the Contractor disturb any such pegs and beacons, he shall have them replaced at his own cost by a registered Land Surveyor. The Contractor is to provide the Engineer with written confirmation from the Land Surveyor that he has replaced the relevant beacons.

The Contractor's attention is drawn to article 35(i) of the Land Surveying Act No. 9 of 1927 (as amended) in this regard.

▪ Blasting

As the construction takes place within some built-up area, extreme care is to be taken during any blasting operations. No blasting shall be permitted without prior written consent from the Engineer. Written as well as verbal notice will be given to all house owners in the affected area 24 hours prior to the blast being set off, and the contractor is to do a survey of all the houses (internal and external) in the area prior to blasting.

A full daily report of all blasting operations (in duplicate) is to be completed by the Contractor.

This report shall inter alia contain the following information:

- Date and time of each blast
- Number of holes
- Charge per hole
- Use of relays, etc.

This report is to be submitted to the Engineer on a weekly basis, and is to be countersigned by the Engineer.

The contractor is to be noted that he is not to use or permit any person to use an explosive powered tool, unless -

- (a) it is provided with a protective guard around the muzzle end, which effectively confines any flying fragments or particles; and
- (b) the firing mechanism is so designed that the explosive powered tool will not function unless -
 - (i) it is held against the surface with a force of at least twice its weight; and
 - (ii) the angle of inclination of the barrel to the work surface is not more than 15 degrees from a right angle:

▪ Protection of existing vegetation

Before any tree is cut down and removed from the site, the Contractor shall confirm the necessity of such action with the Engineer or his Representative.

▪ Access to individual erven

Access to all public and private property must be maintained at all times. Where trenches cross the access point to any property, the Contractor is to arrange for adequate and safe vehicular and pedestrian crossings over the trenches.

The Engineer must approve the method of providing access before any excavation commences.

▪ Use of construction vehicles and equipment

The contractor shall ensure that all construction vehicles and mobile plants—

- (a) are of an acceptable design and construction;
- (b) are maintained in a good working order;
- (c) are used in accordance with their design and the intention for which they were designed, having due regard to safety and health;
- (d) are operated by workers who-
 - (i) have received appropriate training and been certified competent and been authorised to operate such machinery; and
 - (ii) are physically and psychologically fit to operate such construction vehicles and mobile plant by being in possession of a medical certificate of fitness;
- (e) arrangements to guard against the dangers relating to the movement of vehicles and plant, in order to ensure their continued safe operation;
- (f) are prevented from falling into excavations, water or any other area lower than the working surface by installing adequate edge protection, which may include guardrails and crash barriers;
- (g) where appropriate, are fitted with structures designed to protect the operator from falling material or from being crushed should the vehicle or mobile plant overturn;
- (h) are equipped with an electrically operated coustic signalling device and a reversing alarm; and
- (j) are on a daily basis inspected prior to use, by a competent person who has been appointed in writing and the findings of such inspection is recorded in a register.
- (j) no person rides or be required or permitted to ride on any construction vehicle or mobile plant otherwise than in a safe place provided thereon for that purpose;
- (k) every construction site is organised in such a way that, as far as is reasonably practicable, pedestrians and vehicles can move safely and without risks to health;
- (l) the traffic routes are suitable for the persons using them, sufficient in number, in suitable positions and of sufficient size;
- (m) every traffic route is, where necessary indicated by suitable signs for reasons of health or safety;
- (n) bulldozers, scrapers, loaders, and other similar mobile plant are, when being repaired or when not in use, fully lowered or blocked with controls in a neutral position, motors stopped and brakes set;

- (o) whenever visibility conditions warrant additional lighting, all mobile plant are equipped with at least two headlights and two taillights when in operation;
- (p) when workers are working on or adjacent to public roads, reflective indicators are provided and worn by the workers.

Permits and Way leaves:

To be arranged with the relevant authorities.

C3.5.7.1 VARIATIONS AND ADDITIONS TO SANS 1200 STANDARDIZED SPECIFICATIONS FOR CIVIL ENGINEERING CONSTRUCTION

NOTE: Clause numbering used in this Portion of the Contract is in accordance with the clause numbering adopted in the Standardized Specification.

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**PSME
PSME3** **SUBBASE
MATERIALS**

- PSME3.2.1 Subbase material
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PSME5 **CONSTRUCTION**

- PSME5.2.2 Borrow Pits
- PSME5.4 **Placing and Compaction**
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- PSME6.1 **Dimensions, Lever etc.**
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PSME7 **TESTING**

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PSME8 **MEASUREMENT AND PAYMENT**

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- PSME8.3.2 Construct the subbase course/shoulders/gravel wearing course with material from designated excavations
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PSMF **BASE**

PSMF5 **CONSTRUCTION**

- PSMF5.4 **Placing and Compaction**
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PSMF8 **MEASUREMENT AND PAYMENT**

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PSMJ **SEGMENTED BLOCK PAVING**
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- PSMJ3.1 **Units**
- PSMJ3.1.3 Reuse of existing units
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PSMK KERBING AND CHANNELING
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- PSMK3.2.1 General
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PSMK5 CONSTRUCTION

- PSMK5.1 **Excavation and Bedding**
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PSMK8 MEASUREMENT

- PSMK8.2 **Scheduled Items**
- PSMK8.2.1 Concrete Kerbing

PSA GENERAL

PSA2 INTERPRETATIONS

PSA2.3 Definitions

Add the following to the end of Sub-Clause a):

“All agreements, authorisation, instructions etc by the Engineer shall be in writing for them to be binding”

PSA3 MATERIALS

PSA3.1 Quality

Add the following:

“All materials are to be the best of their respective kinds, new, undamaged, sound and free from defects and shall comply with the relevant clauses of the Specification.

All references to Standard Specifications are to the latest amendment to such specifications.

Material bearing the authentic SANS mark or supported by an original certificate from SANS will not be further tested for compliance with relevant specifications. The Engineer may at his discretion require any material not bearing such a mark or accompanied by a certificate to be tested in accordance with the relevant specifications. The Contractor will be responsible for arranging and making payments for such tests by the SANS or other approved body as instructed by the Engineer.

The Engineer will conduct regular on-site inspection of all material to be used on the works. Any material found not to be in accordance with the specification will be rejected and replaced by the Contractor at his own cost, regardless of whether or not the material bears the SANS mark or carries a certificate.

The Engineer may request that the Contractor at his cost, submits samples of material that he proposes to use for the works for approval. Such samples will be kept on site for the duration of the contract and all materials subsequently supplied under the contract shall be of a standard equal to that of the samples. Samples will remain the

property of the Contractor, who shall remove them when called upon to do so by the Engineer.

The Contractor shall give the Engineer at least 48 hours notification of any control testing to be carried out and allow in his program for the test time and results processing.

PSA 3.3 Delay due to supply of materials (New Sub-clause 3.3)

Add the following new sub-clause:

Delay due to supply of materials. The Contractor shall ensure that the work is not delayed, due to the lack of materials on the site of the works, by placing orders with suppliers timeously for the materials required under this Contract

The Contractor shall, by producing copies of written orders or written enquiries to suppliers, prove to the satisfaction of the Engineer that any delay occasioned by non-availability of materials is the result of the inability of suppliers to supply and not due to his failure to place his order timeously or to make exhaustive enquiries for alternative sources of supplies, before any extensions of the contract time will be allowed due to such delays.”

PSA4 **PLANT**

PSA4.1 Silencing of plant

Replace “Machinery and Occupational Safety Act, 1983 (Act No 6 of 1983)” with “Occupational Health and Safety Act 1993 (Act No 85 of 1993)”.

PSA4.2 Contractor’s offices, stores and service

Replace the contents of the Clause with the following:

“The Contractor shall establish at a designated site camp comprising all necessary offices, stores, workshops, ablution facilities, etc, which shall serve as the base of his operations for the full duration of the Contract and which shall be fully serviced including the provision of water, power and sanitary services.

The Contractor will not be permitted to establish a temporary compound for housing employees on the Site. Temporary housing within the Contractor’s site camp and depot site for a maximum of three (3) employees responsible for watching and attendance on any operations which require round the clock attention will however be permitted, provided always that adequate ablution facilities are installed.

The Contractor shall submit to the Engineer, within 7 days of the commencement date, an arrangement drawing of his proposed camp and concrete batching plant and he shall not proceed with the establishment thereof until he has received permission in writing to do so. The establishment may not encroach beyond the designated area without permission first having been obtained in writing from the Engineer.

Temporary buildings and sheds shall be of a standard acceptable to the Engineer for this category of building. Old, dilapidated structures will not be permitted on the Site and any structure erected in conflict with these requirements shall be removed within 24 hours of receipt of written notification from the Engineer to do so.

First aid services shall comply with the applicable provisions of the Occupational Health and Safety Act, 1993.

Toilet and ablution facilities complete with hot and cold running water, and other facilities for construction workers, shall be at least in accordance with Section 28 of the Construction Regulations, 2003 of the Occupational Health and Safety Act, 1993. A minimum of two chemical toilets shall be provided adjacent to the concrete batching plant if established.

All toilet and ablution facilities shall be maintained in a clean, serviceable condition, to the satisfaction of the Engineer. The use of septic tanks and soak-a-ways are not permissible.

The Contractor's site supervisory personnel shall be provided with cell phones for use at all times for effective communication with the Engineer and his staff. The Contractor is to make provision for the cost of maintaining these cell phones in use through establishment items in the Bill of Quantity." No payment nor extension of time will be permissible as a result of delays and/or damage due to failure to communicate.

PSA4.3 Construction Machinery and Tools (New sub-clause 4.3)

Add the following new Sub-Clause

Construction machinery and tools shall be of a suitable type for carrying out the required work. The capacity shall be sufficient to meet the requirements of the contract within the contract period. Machinery and Tools shall be kept at all times in full working order and repair. If the Engineer considers that the machinery and tools in use is in any way inappropriate, inefficient or inadequate in capacity, he shall have the right to call upon the Contractor to provide such additional machinery and/or tools as may be required to meet the requirements of the contract. Hand tools are covered under this item and Contractor will be required to maintain these as well at no additional costs to the contract.

PSA4.4 Medical Facilities and Safety Equipment (New sub-clause 4.4)

Add the following new Sub-Clause

"The Contractor shall provide a fully equipped First Aid Kit which shall be maintained at all times with at least the minimum contents as prescribed in the General Safety Regulations of OHS Act (Act 85 of 1993) – Regulation 3, to deal with any accidents and/or illnesses that may occur on site during the construction period.

The Contractor shall provide personal protective and safety equipment including facilities as prescribed in the General Safety Regulations of OHS Act (Act 85 of 1993) – Regulation 2,

The Contractor shall designate his Safety Officer and First Aider who will be on site at all times. The Safety Officer will be required to hold regular safety meetings and provide minutes of such to the Engineer. The Contractor will be required to provide copies of the Safety Officer and First Aider's credentials to the Engineer.

PSA5 CONSTRUCTION

PSA5.1 Survey

PSA5.1.1 Setting out the works

Substitute the first sentence with the following:

"The works shall be set out in accordance with the drawings or as instructed by the Engineer. Bench Marks will be provided prior to site handover."

Add the following at the end of the first paragraph:

"Setting out is the sole responsibility of the Contractor. No claims resulting from errors in setting out of the works or in levels resulting from errors in the Engineer's control points, bench marks or other beacons will be entertained should the Contractor fail to check such information and report any discrepancies to the Engineer in writing timeously before commencing with the construction of the works."

PSA5.2 Watching, Barricading, Lighting and Traffic Crossings

Add the following:

"The requirements for watching, barricading, lighting and traffic crossings are set out in the Earthworks Specification SANS 1200 D, with the relevant amendments."

PSA5.4 Protection of overhead and underground services

Add the following:

“The Contractor will be required to commence with the detection of existing services immediately after the site handover. Any newly detected services shall be notified to the Engineer and recorded on the “As Built” drawings. Before any excavation is carried out within safe proximity of the position of a known service the Contractor shall notify the Owner of the service, as well as the Engineer or his Representative, that the excavation is to be made and shall ascertain and comply with all conditions imposed by the Owner. The excavation shall not commence until written authorisation has been received from the Owner that excavations may proceed.

The Contractor shall be liable for any damage that may occur to any service as a result of his operations and he shall immediately notify the Owner and the Engineer of such damage and make all arrangements and pay all costs in connection with the repair thereof.”

PSA5.5 Dealing with water on work

Add the following:

“The Contractor is advised to check with the Geotechnical Report for sections in his works that may be subjected to ground water to make adequate provision for dealing with the water”.

PSA5.6 Pollution

Add the following:

“In addition to any other specified or statutory requirements, the Contractor shall pay particular attention to dust disturbance during construction.”

PSA5.7 Safety

Add the following:

“The Contractor shall at all times observe the provisions of the Occupational Health and Safety Act, Act No. 85 of 1993 and the Construction Regulations 2003. In compiling his Health and Safety Plan the Contractor is advised that the risks associated with the execution of the contract include but are not necessarily limited to the following:

- The stability of the sides of excavations and stockpiles.
- Open excavations.
- The movements of heavy construction equipment.
- The use of explosives.
- The loading, transport and off-loading of heavy equipment and components.
- Working in elevated positions.
- The generation of dust and noise pollution.
- The possibility of exposing and working around live electrical cables.

All personnel engaged on the site, including the Engineer and his Representatives, subcontractors, suppliers and other visitors, shall be issued with Personal Protection Equipment (PPE) comprising at least two (2) overalls, a safety hat (hard-hat) and a pair of safety-boots. Methane detection equipment, safety glasses, face masks, gloves and safety harnesses shall also be issued as required or dictated by the nature of the work being undertaken.

With the exception of those provided to the Engineer and his Representatives, the overalls and hard hats shall be of uniform colour and shall have the Contractor's name clearly displayed thereon. The overalls and hard-hats provided for the Engineer shall be of a different colour to those of the Contractor and shall be embossed with the Engineer's name and logo, all to the approval of the Engineer.

It shall be incumbent on the Contractor to ensure that all personnel wear the specified PPE at all times while engaged on the Works and the Engineer shall have the authority to order from the site of the Works any person not wearing the correct PPE and/or not clearly identifiable as being in the employ of the Contractor.
 Persistent and repeated breach by the Contractor of the Act and/or this clause shall constitute ground for the Engineer to act in terms of Sub Clause 9.2 of the General Conditions of Contract 3rd Edition 2015 and for the Employer to terminate the contract in accordance with the further provisions of Clause 9”

PSA5.9 Training of Local Labour (New sub-clause 5.9)

Add the following new Sub-Clause

“As part of the national drive to provide job opportunities to communities, the Contractor is required to engage as many as possible temporary employment to the local community. It is incumbent on the Contractor to provide the necessary core of artisans, skilled and semi-skilled personnel required to construct, supervise and adequately control the project as well as providing necessary on-going training in basic construction skills to the locals”.

PSA5.10 Workmen’s Compensation Act (New sub-clause 5.10)

Add the following new Sub-Clause

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

PSA8 MEASUREMENT AND PAYMENT

PSA8.2 Payment

Add the following new sub-clause:

PSA8.2.5 Adjusted Payment for Time Related Items

“The formula below will be used to calculate the payment adjustment for the Contractor’s time related items in the event of a time extension with costs having been awarded:

Sum of Tendered Amounts for time related items	x	$\frac{\text{Extended contract period as authorized by a variation order}}{\text{Tendered Contract period}}$
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PSA8.3 Scheduled fixed-charge and value-related items

PSA8.3.2 Establishment of Facilities on the Site

PSA8.3.2.1 Facilities for Engineer

Add the following new payment items:

- PPE as specified inUnit: Sum
- Cellular communications, as specified inUnit: Sum
- Office equipment and internet connection as specified inUnit: Sum
- Refrigerator, as specified inUnit: Sum
- Microwave oven, as specified inUnit: Sum
- Kettle, as specified inUnit: Sum
- Survey instruments, as specified inUnit: Sum

The tendered rate shall include all costs and charges, including provision for overheads and profits related to providing the required facilities, complete as specified. The tendered rate shall also include provision for repairing or replacing the facilities should they be lost, stolen or damaged, but should exclude provision for any running costs, which shall be paid under SANS 1200D Clause 8.4, as amended herein.”

PSA8.3.2.2 Facilities for Contractor

Add the following new payment item:

PPE for all Contractor personnel, including sub-contractors, suppliers and visitors, as specified in Unit: Sum

PSA8.3.3 Other fixed-charge obligations

Amend the description of the payment item as follows:

“The sum shall cover the fixed costs of all other obligations, including all safety provisions as prescribed by the Occupation Health and Safety Act, (Act No 85 of 1993) and the Construction Regulations, 2003, that are required for the proper execution of the Works in accordance with the requirements of the Specifications and the Conditions of Contact, and that are not specifically covered in 8.3.1, 8.3.2 and 8.3.4.”

PSA 8.4 SCHEDULED TIME-RELATED ITEMS

PSA8.4.5 Other time-related obligations

Amend the description of the payment item as follows:

“The sum shall cover the time-related costs of all other obligations, including all safety provisions as prescribed by the Occupation Health and Safety Act, (Act No 85 of 1993) and the Construction Regulations, 2003, that are required for the proper execution of the Works in accordance with the requirements of the specification and the conditions of contact, and that are not specifically covered in 8.4.1-8.4.4 (inclusive).”

PSA8.5 SUMS STATED PROVISIONALLY BY ENGINEER

Add the following sub-clauses:

PSA8.5(c) Community Liaison Officer Unit: Month

A Salary must be paid by the Contractor to an appointed Community Liaison Officer at the rates stipulated in the Bill of Quantity and agreed to by the local authorities. The Liaison Officer will be expected to be available at all times during the construction period.

PSA8.5(d) Environmental Control Officer Unit: Month

A Salary must be paid by the Contractor to an appointed Environmental Control Officer at the rates stipulated in the Bill of Quantity. The Officer will be expected to be available at all times during the construction period.

PSA8.5(e) Relocation of Services.....Unit: Prov Sum

“Expenditure of the provisional sum above shall be made in accordance with the general conditions of contract.

PSA8.5 (f) Additional Testing Required by the Engineer:Unit: Prov Sum

Provisional Sum for testing requested by the Engineer by an approved independent laboratory including travelling expenses and supply of a certified copy of test results

PSA8.5 (g) Remuneration of Health and Safety representative.....Unit: Month

A Salary must be paid by the Contractor to an appointed health and safety representative at the rates stipulated in the Bill of Quantity. The Representative will be expected to be available at all times during the construction period.

PSA8.5(h) Remuneration of Health and Safety Agent.....Unit: Prov Sum

A Salary must be paid by the Contractor to the Engineer for the appointed health and safety agent at the rates stipulated in the Bill of Quantity.

PSA8.5 (i) Supervision for duration of construction for Engineer.....Unit: Month

The sum shall cover the costs of on-site supervision and such local administration as the Engineer considers necessary for the proper completion of the works.

PSA8.5(j) Social Facilitator..... Unit: Prov Sum

Payment will be made on a daily basis as and when required by the Client or Clients representative. The Social facilitator will be paid a daily rate as approved by the Engineer.

PSA8.5(k) Specialised Studies..... Unit: Prov Sum

Additional specialised studies may be required by DEDET. Payment shall be made according to the required studies conducted.

PSA8.5(l) Training of operators and staff during implementation of new pumpstation for 1 month.....Unit: Prov Sum

Training must be provided to all operators of the newly constructed pumpstation. This will include the use of all machinery and equipment. Training must also be provided in general maintenance procedures of the pumpstation. Expenditure of the provisional sum above shall be made in accordance with the general conditions of contract.

PSA8.5(m) Construction Industry Board (CIDB) fee month.....Unit: Prov Sum

PSA8.5 (n) Additional Survey.....Unit: Prov Sum

A Provisional sum must be paid by the Contractor to the Consultant for the additional survey. Expenditure of the provisional sum above shall be made in accordance with the general conditions of contract.

PSA8.5 (p) Compilation of Environmental Management plan..... Unit: Prov Sum

A Provisional sum must be paid by the Contractor to the Consultant for the Compilation of the Environmental management plan. Expenditure of the provisional sum above shall be made in accordance with the general conditions of contract.

PSA8.5 (q) Overhead costs, charges and profit on item 8.5(c) to 8.5(p) above Unit: %

The tender percentage is a percentage of the amount actually spent under the relevant items which shall include full compensation for the handling costs of the contractor, and the profit in connection with providing the specified services.

PSA8.8 TEMPORARY WORKS

PSA8.8.4 Existing Services

Amend payment items (c) and (d) as follows:

Excavation by hand in soft material to expose any and all services.....Unit: Sum

Temporary protection, as required or as indicated by the Engineer, of any and all services..... Unit: Prov Sum

The tendered rate in respect of (c) shall include full compensation for all plant, labour, materials and other incidentals, including any fees or charges payable to the service

authority concerned, required to excavate carefully by hand to expose existing services and accurately determine the position and depth thereof.

In respect of (d), the Contractor shall be reimbursed at a rate negotiated with the Engineer prior to the execution of the works, which rate shall be based on the tendered rates, where applicable, and which shall include provision for overheads, administration charges and profit.”

PSA8.9 OCCUPATIONAL HEALTH AND SAFETY

Add the following sub-clauses:

PSA8.9.1 Cost of Health and Safety Measures requiredUnit: Sum

Rate to cover all costs related to the provision and maintenance for the duration of the contract of the health and safety measures required in terms of Clause 5 (Principal Contractor and Contractor) of the Construction Regulations (2003) of the Occupational Health and Safety Act. No other sum shall be paid in this respect and tenderers must adequately price for this.

PSA8.9.2 Compilation and maintenance of a health and safety planUnit: Sum

Rate to cover all costs related to the provision and maintenance for the duration of the contract of the Health and Safety Plan as required in the Construction Regulations (2003). The rate shall include all costs for risk assessments required as well as development and implementation of safe work procedures and method statements. No other sum shall be paid in this respect and tenderers must adequately price for this.

PSA8.9.3 Compilation and maintenance of a health and safety file.....Unit: Sum

Rate to cover all costs related to the provision and/or collection of data (drawings, design, materials, operation and maintenance manuals etc) to be contained in the file, co-operation with other parties, compilation and maintenance of the file for the duration of the contract and the handing over of the file to the client on completion of the contract. No other sum shall be paid in this respect and tenderers must adequately price for this

PSA8.10 ENVIRONMENTAL MANAGEMENT PLAN

Add the following sub-clauses:

PSA8.10.1 Providing a Method Statement on compliance with client's Environmental Management Plan SpecificationUnit: Sum

Sum to cover the Contractor's initial cost of providing and demonstrating to the Engineer a suitable and sufficiently documented Method Statement based on Client's documented Environmental Management Plan Specifications as set out under Part C3: Scope of Works of this document

PSA8.10.2 Complying with the Environmental Management Plan (EMP)Unit: Sum

Sum to cover all the time related cost for complying with the Environmental Management Plan (EMP) Specifications as set out under Part C3 Scope of Works of this document and not specifically covered in PSA8.10.1

PSAB ENGINEER'S OFFICE
PSAB1 SCOPE

Replace Sub-Clause 1.1 with the following:

"1.1 This specification covers the requirements for offices and the associated facilities for the use of the Engineer and his representatives on the Site."

PSAB3 MATERIALS
PSAB3.1 Nameboards

Substitute the following:

"South African Institution of Civil Engineers." With "South African Association of Civil Engineers"

PSAB3.2 Office building(s)

Delete the first paragraph and replace with the following:

"The contractor shall supply and furnish an office for the use of the engineer and his representatives. the office shall comprise a single room with a floor area of at least 24 m². the floor to ceiling height of each office shall be at least 2.5 m."

Delete the contents of the Sub-Clause from the start of the third paragraph to the end of the sub-clause and replace with the following:

"The internal fittings and furnishings shall include the following:

- a) One (1) table, 2.5 m long x 1.2 m wide x 0.73 m high
- b) One (1) "L-shaped" desk measuring 1.6 m long on the long side and 1.2 m long on the short side x 0.75 m wide x 0.75 m high with 3 drawers
- c) Eight (8) standard office chairs
- d) One (1) high-back office chair on casters
- e) One (1) lockable four drawer steel filing cabinet, with keys.
- f) One (1) bookcase, 1.2 m high x 0.8 m wide x 0.3 m deep with four shelves.
- g) One (1) white-board measuring 2 m x 1 m mounted on the wall, complete with eraser and red, blue and black pens
- h) Approved burglar guarding on all windows
- i) Acceptable blinds on all windows
- j) A minimum of three (3) 220/250-volt power points
- k) Two (2) double 55-watt fluorescent light fittings, complete with ballast and tubes
- l) An air-conditioning unit of 2.2 kW minimum capacity, capable of both cooling and heating, complete with own power source

The Contractor shall provide two covered parking bays 5 m long x 3 m wide in close proximity to the abovementioned office for use by the Engineer and his representatives. The bays shall be suitably gravelled and pathways provided to the offices such that mud-free access is afforded even in times of heavy rain.

The contractor shall supply and equip ablution facilities with a floor area of at least 5 m², an opening window with a glazed area of at least 0.9 m² and a lockable door, containing at least a toilet, a hand wash basin with hot and cold water, a mirror, a single 100-watt incandescent light and a suitable blind on the window, for the exclusive use of the engineer and his representatives in reasonable proximity to his offices.

On completion of the works ownership of the buildings erected by the contractor and their furnishings shall revert to the contractor who shall remove them from the site."

PSAB4 PLANT
PSAB4.1 Telephone

Add the following:

"If a Telkom phone cannot be provided, a cell phone shall be made available for the duration of the contract in addition to any other cell phones specified. This unit will be kept in the office and not assigned to a particular member of staff."

PSAB 4.2 Cellular Communications (New sub-clause 4.2)

Add the following new Sub-Clause:

Cellular Communications. The contractor shall provide one cellular telephone connected to a recognised service provider, for the exclusive use of the Engineer's site representatives for the duration of the contract, including a carrying pouch / holster and a battery charger for the office

It is recommended that the cellular telephones are insured against loss or damage, as it shall be repaired or replaced immediately, at the contractor's cost, if damaged or stolen.

Payment for the cost of the provision of this service shall be made under the relevant bill items. Additional items have been provided in the Bill of Quantity for the cost of calls in the form of monthly pre-paid airtime into the line. These payment items do however not include provision for the cost of any insurance the Contractor may take out to cover the cellular telephone or the cost of replacement sets, for which provision is deemed to have been made in the amounts tendered under other related items".

PSAB4.3 Office Equipment (New sub-clause 4.3)

Add the following new Sub-Clause:

Office Equipment. The Contractor shall provide the Engineer with an all-in-one colour office machine capable of faxing, copying, printing and scanning (min HP Laser M175 3 in 1 or similar approved) for the exclusive use of the Engineer and his representatives. The Contractor will be required to provide for the running cost of this equipment upon the written request of the Engineer on consumables (e.g. paper, cartridges etc).

It is recommended that the equipment is insured against theft or damage, as it shall be repaired or replaced immediately, at the contractor's cost, if damaged or stolen.

Payment for the cost of the provision of this service shall be made under the relevant bill items. These payment items do however not include provision for the cost of any insurances the Contractor may take out on this equipment, for which provision is deemed to have been made in other relevant items."

PSAB4.4 Internet Connection (New sub-clause 4.4)

Add the following new Sub-Clause:

Internet Connection. The Contractor shall provide the Engineer with an internet connection with an approved service provider for the duration of the contract for the purpose of sending and receiving e-mails in connection with the contract only. Unless a Telkom line is provided the connection shall be in the form of a computer modem (minimum 3G) from an approved service provider with a stable network at the site offices and 2Giga bytes monthly.

Payment for the cost of the provision of this service (monthly subscriptions), will be made through the relevant Bill of Quantity Items."

PSAB4.5 Refrigerator (New sub-clause 4.5)

Refrigerator. The Contractor shall provide a refrigerator of minimum 220 litre capacities with lockable doors in the Engineer's offices for the exclusive use of the Engineer and his representatives."

PSAB4.6 Microwave Oven (New sub-clause 4.6)

Microwave Oven. The Contractor shall provide a microwave oven with a minimum power rating of 850 watt, located on a suitable wall-mounted shelf in the Engineer's offices for the exclusive use of the Engineer and his representatives."

PSAB4.7 Kettle (New sub-clause 4.7)

Kettle and Tea Service. The contractor shall provide a suitable electric kettle and tea service cutlery for 6 in the Engineer's offices for the exclusive use of the Engineer and his representative."

PSAB4.8 Survey Instruments (New sub-clause 4.8)

Add the following new Sub-Clause:

Survey Instruments. The Contractor shall make the following instruments available in good condition and adjustment for the use of the Engineer on the Works for the duration of the Contract:

- a) An approved Theodolite (to be shared with the Contractor)
- b) Wild N1 Level (or equal) and tripod
- c) 5m Level Staff (5mm graduations)
- d) 100m steel or similar approved Tape
- e) 30m Steel or similar approved Tape
- f) measuring wheel (new – digital or approved)
- g) Six (6) 2,5m Ranging Rods

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. On completion of the Works ownership of the survey instruments shall revert to the Contractor.

Payment for the cost of the provision of the required instruments shall be made under the item for equipment for the Engineer.”

PSAB5 CONSTRUCTION

PSAB5.1 Name Boards

Add the following:

“The name boards shall be erected within one month of the letter of acceptance at positions indicated by the Engineer and depicting the details as provided in the drawing for such as issued. The Contractor will be permitted to place his own name boards in positions and quantity agreed to and approved by the Engineer.”

PSAB5.2 Engineer’s Office(S)

Delete the contents of the existing sub-clause and replace with the following:

“The Contractor shall provide proper maintenance and cleaning of the Engineer’s offices, ablution facilities, car-ports and their surrounds to the satisfaction of the Engineer, including the provision of adequate cleaning staff and all necessary toiletries and cleaning equipment, for the duration of the contract.”

PSAB5.3 Key Personnel

Add the following:

“The Contractor shall inform the Engineer the appointed person responsible for the Occupational Health and Safety matters on site and provide valid certificates of competency for the first aiders. It is the Contractor’s responsibility to provide copies of all safety meeting minutes to the Engineer and ensure that these are held on a regular basis.”

PSAB5.5 Survey Assistants

Substitute:

“suitably educated survey labourers with semi-skilled labourers with an understanding of general site survey activities.

No additional payment will be made to the Contractor for the provision of the survey assistants and equipment and Contractor must include the cost in his rates for such facilities.”

PSC **SITE CLEARANCE**

PSC3 **MATERIAL**

PSC3.1 **Disposal of Material:**

Substitute the first sentence with the following:

“Material for disposal from clearing, grubbing, demolition, dismantling of manholes and concrete works, and removal of pipes shall be disposed off-site in demarcated Municipal dumping areas in the vicinity. The Contractor must confirm with the Employer the use of the selected dumping area prior to disposal.”

PSC5 **CONSTRUCTION**

PSC5.1 **Areas to be Cleared and Grubbed**

Substitute the first sentence with the following:

Clearing and grubbing shall only be carried out in areas as instructed in writing by the Engineer and limited to 3m widths for pipe and cable trenches.

Add to the last sentence with the following:

The Contractor shall program his work to avoid re-clearing. The cost of re-clearing will be borne by the Contractor.

PSC5.2.3.2 Individual Trees

Replace the last sentence with the following:

“An amount of R 5,000 will be deducted from moneys due to the Contractor as a penalty for every tree that is damaged or removed unnecessarily.”

PSC5.9 **Precast concrete kerbing and block paving (New sub-clause 5.9)**

Add the following new sub-clause:

“5.9 PRECAST CONCRETE KERBING AND BLOCK PAVING. Where existing concrete block paved roads, or portions thereof, require removal to facilitate the construction of the works, the existing precast units (blocks and kerbs) shall be carefully removed, taking care not to damage the units or the underlying base. Immediately on removal, the units shall be re-inspected for damaged and if still suitable for reuse shall be thoroughly cleaned and neatly stacked in an approved prepared area for reuse.

Prior to commencing the removal, the Contractor, together with the Engineer, shall inspect the road and agree and record which units are damaged and are therefore not suitable for reuse. Such units shall be clearly marked using red spray paint and transported to an approved dump site immediately on removal thereof.

Previously undamaged units damaged on removal as a result of the Contractor’s failure to exercise due care and diligence shall be replaced with new units of the same type at his cost.”

PSC5.10 **Existing Fencing (New sub-clause 5.10)**

Add the following new sub-clause:

“5.10 EXISTING FENCING. The fences around the site shall not be removed and shall be repaired immediately after damage to them has occurred.

The Contractor is advised to make sketches and take photographs of existing fences before they are removed to avoid arguments that may arise with property owners thereafter. Where access points are necessary across existing fences the Contractor shall provide lockable gates with the express permission of the Engineer and reinstate the fence on completion of the works or when access through the point is no longer required.”

PSC8 MEASUREMENT AND PAYMENT.

PSC8.2 Scheduled items

Add the following new payment items:

PSC8.2.11 Remove existing precast kerbing and/or channelling:

- a) To stacking area for re-use:
 - i) Barrier KerbsUnit: m
 - ii) Combination mountable kerb and channelUnit: m
- b) To approved dump site:
 - i) Barrier KerbsUnit: m
 - ii) Combination mountable kerb and channel.....Unit: m

The rate in respect of (a) shall include full compensation for all plant, labour, materials, transport and other incidentals required for the careful removal of existing kerbing and/or channelling and the cleaning and stacking thereof in temporary sites agreed with the Engineer. The rate shall also include full compensation for the extra care and diligence required to remove the units without damage. Only units removed on the instructions of the Engineer will be measured for payment.

The rate in respect of (b) shall include full compensation for all plant, labour, materials, transport and other incidentals required for the marking and removal of damaged kerbing and/or channelling and the disposal thereof in an approved dump site.

PSC8.2.12 Remove existing concrete block paving:

- a) To temporary sites for re-use Unit: m²
- b) To dump in approved siteUnit: m²

The rate in respect of (a) shall include full compensation for all plant, labour, materials, transport and other incidentals required for the careful removal of existing concrete block paving and the cleaning and stacking thereof at temporary sites agreed with the Engineer. The rate shall also include full compensation for the extra care and diligence required to remove the units without damage. Only units removed on the instructions of the Engineer will be measured for payment.

The rate in respect of (b) shall include full compensation for all plant, labour, materials, transport and other incidentals required for the marking and removal of existing concrete block paving and the disposal thereof in an approved dump site. Should the existing base be damaged by the Contractor's operations during the removal process, it shall be repaired to the Engineer's satisfaction at the Contractor's own cost.

PSD EARTHWORKS

PSD1 SCOPE

PSD1.1.1 Add the following to Clause 1.1:

“This Specification also covers the selection and placing of excavated or stockpiled materials in their final position in engineered earth mattresses or in stockpiles or for spoiling unsuitable or excess materials in approved spoil sites.”

PSD2 INTERPRETATIONS

PSD2.3 Definitions

Delete the existing definition of “Restricted Excavation” and replace with the following:

“Restricted Excavation. An excavation so restricted in area or width or by the proximity of structures and/or services so as to preclude the use of bulk earthmoving equipment and which may require the use of alternative means of excavation, even hand excavation and extra planning, care and attention.”

Add the following new definitions:

“Restricted Placing. The placing, processing, shaping and compacting of materials in embankments, backfill, selected subgrade and engineered earth mattresses in areas so restricted in dimension or by the proximity of structures and/or services so as to preclude the use of bulk earthmoving and compaction equipment and which may require the use of alternative means of construction and extra planning, care and attention.”

Grade Level: The finished bulk earthworks level over the width and length shown on the drawings required to carry the engineered earth mattress layer.

Subgrade: Includes all material, whether in-situ or imported, beneath grade level and under the grade width and length.

Selected Subgrade: The upper 250 mm of the subgrade, which shall be constructed to specified level and thickness tolerances and which shall comprise material of a specified quality, compacted to a specified density.

Formation Level: A boundary surface in the subgrade which may need to be formed to ensure the specified thickness of the Selected Subgrade.

Engineered Earth Mattress: Foundation layers consisting of natural gravel and processed gravel or other selected material compacted to specified standards to provide a defined thickness of foundation between the grade level and the base of structures.”

Sand (cohesion less and non-cohesive): for the purpose of the compaction of requirements, a non-plastic material of which not less than 95% by mass passes a sieve of nominal aperture size 4.75mm and not more than 10% passes a sieve of nominal aperture size 0.075mm.

PSD3 MATERIALS

PSD3.1 Classification for excavation purposes

PSD3.1.2 Classes of Excavation

Delete clause 3.1.2 and replace with the following:

“the excavation of material will be classified as follows for purposes of measurement and payment:

- a) Common excavation: Excavation in all material other than hard rock or boulder excavation, as defined in PSD 3.1.1.
- b) Hard Rock Excavation: Other than in restricted excavation, hard rock excavation shall be the excavation of bulk rock in banks or ledges which requires blasting for practical excavation.

In the case of restricted excavation, blasting shall not be permitted and hard rock excavation shall be the excavation of bulk rock in banks or ledges which requires the use of wedging and splitting or pneumatic breakers for practical excavation.

- c) **Boulder Excavation:** Boulder excavation shall be excavation in material containing more than 40 % by volume of boulders of size between 0,03m³ and 20m³, in a matrix of soft material or smaller boulders. Excavation of solid boulders or lumps of solid dolomite exceeding 20m³ will be classed as hard rock excavation. The excavation of fractured or fissured rock shall not be classified as boulder excavation but shall be classified as intermediate excavation which requires pneumatic breakers for practical excavation.

PSD3.2 Classification for Placing Purposes

Add the following new sub-clauses:

- PSD3.2.4 Material Suitable for Subgrade below Engineered Earth Mattresses. All subgrade material placed below engineered earth mattresses, whether in embankments or as backfill to any subgrade excavation shall be of at least G9 quality, as defined in TRH 14, except that the Plasticity Index (PI) shall not exceed the lesser of 18 or 4GM+10.”
- PSD3.2.5 Material Suitable for Selected Subgrade below Engineered Earth Mattresses. All Selected Subgrade material below engineered earth mattresses, whether in-situ or imported, shall be of at least G8 quality, as defined in TRH 14, except that the Plasticity Index (PI) shall not exceed 14 and the maximum particle size after compaction shall be 100 mm.”
- PSD3.2.6 Material Suitable for use in Engineered Earth Mattresses. All material used for the construction of engineered earth mattresses shall be of at least G6 quality, as defined in TRH 14, except that the Plasticity Index (PI) shall not exceed 12. Material used in the top 300 mm of engineered earth mattresses shall be chemically stabilised to produce a cemented layer of C4 quality, as defined in TRH 14.”

PSD3.3 Selection

PSD3.3.1 General

Delete the second sentence of the sub-clause and replace with the following:

“The Contractor shall deal selectively with materials from all excavations in order to optimise their use. If selected materials designated by the Engineer are contaminated, mishandled or misplaced by the Contractor he will be required to replace the shortfall with material of at least equal quality at his own cost.”

Add the following new sub-clause after 3.3.2:

- PSD3.3.3 Subgrade, Selected Subgrade and Engineered Earth Mattresses. Material from excavations which is suitable as subgrade, selected subgrade or engineered earth mattresses, as defined in PSD3.2, shall be classified as such and stockpiled as directed for later reuse.”

PSD3.4 Subsoil drain under structures

Add the following new sub-clause after 3.3.2:

“Subsoil drains consisting of 110mm diameter perforated or slotted uPVC pipes or 100mm diameter geopipes in a bed of 19mm stone, all as specified and shown in the drawings, shall be installed where shown in drawings. Where not indicated the pipes shall be connected with approved couplings and laid to a minimum of 1:200 gradient.

PSD3.4.1 Material for SubSoil Drainage

PSD3.4.1.1 Pipes

“Subsoil pipes for drainage shall be uPVC perforated or slotted and complying to SANS 791 .”

Perforations are to be 8mm diameter (+/- 1.5mm) and the number of perforations per metre shall be minimum 26 and 52 for 110mm and 160mm diameter pipes respectively. Two and three perforation rows shall apply for 110mm and 160mm diameter pipes respectively.

Slotted pipes will have similar slot dimensions as perforations above and arrangement will be subject to Engineer’s approval.

Non perforated or slotted pipes for use for subsoil drainage will be uPVC.”

PSD3.4.2 Crushed Stone

“Crushed stone in subsoil drains shall be 19mm single sized stone to grading requirements of stone in concrete in SANS 1083 .”

PSD3.4.3 Geotextile Blanket

“The geotextile blanket around subsoil drains shall be woven polypropylene tape similar and equal to S110.”

PSD3.4.4 Sand

“Sand in subsoil drains shall comply with requirements of PSD2.3.”

**PSD4 PLANT
PSD4.3 Transport**

Add the following:

“Where any of the contractor’s operations or the movement of any of the contractor’s, his sub-contractor’s or his supplier’s vehicles or mobile plant, or any combination of such activities causes damage to the surface of any road or to any service, the contractor shall arrange for the repair of such surface or service as a matter of urgency and at his own expense.”

PSD4.4 Detectors

Replace the contents of sub-Clause 4.4 with the following:

"The Contractor shall, for the purposes of detecting and locating underground services in accordance with the provisions of sub-clause 5.4 of SABS 1200 A and sub-clause 5.1.2 of SABS 1200 D, at his own cost, provide and use detecting equipment which is suitable for the detection of underground cables and pipes."

**PSD4.5 Avoiding Quagmire Conditions
Add the following new sub-clause**

“contractor is to take all diligent care to avoid quagmire conditions occurring on site especially in excavations. It is recommended that he makes use of relatively static plant use shall be supported by hand trimming to achieve final levels. Should contractor allow quagmire conditions to develop, the engineer will order him to rectify immediately at his own cost.”

PSD5 CONSTRUCTION

PSD5.1 Precautions

PSD5.1.1 Safety

PSD5.1.1.1 Barricading and Lighting

Change “the applicable regulation of the machinery and occupational safety act, 1983 (act 6 of 1983)” **in the first sentence to** “the construction regulations, 2003, of the occupational health and safety act, 1993 (act 85 of 1993)”

Delete the Sub-clause and substitute the following:

a) For Excavations Other Than Trenches:

- i) Adequately protected by a barrier or fence at least one metre high erected as close to the excavation as is practicable; and
- ii) Provided with red warning lights or any other visible boundary indicators at night or when visibility conditions are poor; and
- iii) Inspected by watchmen employed by the Contractor to ensure that barricades and lights are effective at all times.

b) For Trench Excavations

- i) Adequately protected by means of at least two horizontal double sided 'red/white' Chevron Tapes approved by the Engineer. The tapes shall be stretched tightly between suitable supports along both sides and ends of the excavation at levels approximately 0,45 m and 1,25 m above the ground. The supports shall consist of poles or iron standards securely planted in solid ground at not more than 10 m centres so as to enclose the spoil and the excavations.
- ii) Provided with red warning light or any other visible boundary indicators at night or when visibility conditions are poor. The spacing between lamps along an open trench shall be not greater than 10 metres. All lamps shall be kept in good order and continuously lit from dusk to dawn and the Contractor shall employ a night watchman to ensure that the lamps remain lit.
- iii) Provided with a sufficient number of steel plates at least 2 m x 1,20 m x 8 mm thick which may be laid across open excavated trenches to provide bridges for vehicles along the route of the work as and where may be considered necessary by the Engineer. The Contractor shall make such plates available on Site at all times.
- iv) Provided with protection for a private vehicular or a pedestrian crossing over an open trench. Such crossings shall be protected on each side by a stout two rail timber fence, at least 1 m high, consisting of 150 mm x 75 mm timber verticals set 0,50 m into the ground, with 75 mm x 50 mm rails securely nailed to them. Where timber is used for bridges, it must be battened underneath to prevent tipping. At least 4 lamps must be provided at each crossing.
- v) Provided with warning barriers in addition to the barricading and light requirements set out above, where construction is in, or across, public roads. The barriers shall comprise 225 mm x 40 mm timbers firmly fixed to heavy supports. The barriers shall be located at least 20 m distance from the obstruction in the directions of all approaching traffic; and the requisite ROAD CLOSED, DEVIATION and other signs shall be prominently displayed well in advance of the work. All such signs and positioning thereof shall comply with the requirements set out in the S.A. Road Traffic Signs Manual.
Where only a portion of the roadway is closed suitable empty drums or pipes painted white shall be placed along the traffic side at distances not more than 20 m apart.
Lamps in good order shall be provided one to each drum or pipe and at least five to each barricade, in addition all poles and warning notices shall be clearly marked by means of approved reflecting material.
- vi) Regularly inspected by watchmen employed by the Contractor to ensure that barricades, bridges, warning barriers and lights are effective at all times.

PSD5.1.1.2 Safeguarding of Excavations

Change "machinery and occupational safety act, 1983 (act 6 of 1983)" in paragraph "a)" to "occupational health and safety act, 1993 (act 85 of 1993)".

Any cost the Contractor may undergo in ensuring the safety of excavations or any additional excavation and backfilling he may have to undertake due to the unstable sides of excavations and trenches shall be held to his account and the various rates for excavation and trenching included in the Schedule of Quantities shall include full compensation therefore.

PSD5.1.1.3 Explosives

Replace the contents of this sub-Clause with the following:

"The Contractor will generally be permitted to use explosives for breaking up hard material during excavations, for demolishing existing structures, and for other purposes where explosives are normally required, subject to the following conditions:

- (a) The Engineer may prohibit the use of explosives in cases where, in his opinion, the risk of injury to persons or damage to property or to adjoining structures is too high. Such action by the Engineer does not entitle the Contractor to additional payment for having to resort to less economical methods of construction.
- (b) The Engineer's prior written approval shall be obtained for each and every blasting operation. This approval may be withheld if the Contractor does not use explosives responsibly and carefully.
- (c) The Contractor shall comply fully with the applicable legislation and regulations.
- (d) Before blasting is undertaken, the Contractor shall satisfy the Engineer that he has established whether or not the insurers concerned require pre- and post-blasting inspections of buildings and structures within a certain radius of the proposed blasting.

Should such inspections be required, the Contractor shall, together with the Engineer and the insurer, examine and measure the buildings, houses or structures in the vicinity of the proposed blasting site and establish and record, together with the owner, lessee or occupier, the extent of any existing cracking or damage before blasting operations commence.

- (e) When there is a possibility of damage to power and telephone lines or any other services or property, the Contractor shall adapt his method of blasting and the size of the charges and shall use adequate protective measures (eg cover-blasting) to reduce the risk of damage.
- (f) All accidents, injury to persons and animals and damage to property shall be reported to the Engineer in detail and in writing as soon as is practicable.
- (g) The Engineer shall be given 24 hours' notice by the Contractor before each blasting operation is carried out.
- (h) When blasting to specified profiles, the Contractor shall so arrange the holes and charges that the resulting exposed surfaces are as sound as the nature of the material permits. The Contractor shall make good, at his own expense, any additional excavation necessitated by the shattering of rock in excess of any overbreak allowances specified in the Project Specifications or given on any Drawing.

Notwithstanding the Contractor's compliance with the above provisions, the Contractor shall remain liable for any injury to persons and animals and loss of or damage to property occurring as a result of blasting operations."

PSD5.1.2 Existing services

PSD5.1.2.2 Detection, location and exposure

Replace the contents of sub-Clause 5.1.2.2 with the following:

"The exposure by the Contractor of underground services, as required in terms of sub-clause 5.4 of SABS 1200 A (as amended) shall be carried out by careful hand excavation at such positions and to such dimensions as are agreed to by the Engineer.

Unless otherwise instructed or agreed by the Engineer, no service shall be left exposed after its exact position has been determined and all excavations carried out for the purposes of exposing underground services shall be promptly backfilled and compacted to the following densities:

- (a) In roadways: 93-97% Mod AASHTO density; and

(b) In all other areas: 90% Mod AASHTO density.

Where hand excavations to expose underground services have to be carried out in roadways, the Contractor shall reinstate the road layerworks in accordance with the provisions of sub-clause 5.9 of SABS 1200 DB.

Payment in respect of reinstating layerworks in roadways will be made in accordance with sub-clause 8.3.6 of SABS 1200 DB (as amended)."

PSD5.1.2.4 Negligence

Amend the sub-clause as follows:

"where a service is damaged as a result of the contractor's negligence, he shall bear the cost of the repairs as specified by the owner of the service. Under certain circumstances the contractor will also be liable for consequential damages."

PSD5.1.3 Stormwater and Groundwater

Add the following to clause 5.1.3:

"certain portions of the permanent works may come into contact with the ground water table level. Appropriate measures incorporating geo-fabric and rock fill have been provisionally designed for use in such areas. Suitable temporary sumps shall be formed and a dewatering pump shall be continuously provided at each affected excavation in order that the construction of rock fill or other measures may proceed under controlled conditions.

Dewatering pumps shall have a capacity of not less than 10 liters/second and be fitted with discharge hoses of not less than 80 mm. The contractor shall maintain at least a 50% reserve of pumps i.e. for every two pumps in use at least one similar sized machine shall be kept in reserve for emergency use."

PSD5.1.4 Nuisance

PSD5.1.4.1 Dust Nuisance

Add the following to clause 5.1.4.1

"the contractor is responsible for dust control and is liable for all claims that may result from dust nuisance on all parts of the site and at all times during the contraction period. Contractor is to make provision for dealing with dust in his rates and no additional payment will be made on account of such necessary measures undertaken"

PSD5.2 Methods and Procedures

PSD5.2.1 Site Preparation

PSD5.2.1.1 Clearing

Insert the following into the third line of the first sentence, after "or structures":
",or areas to be utilised as stockpile sites"

PSD5.2.2 Excavation

PSD5.2.2.1 Excavation for General Earthworks and for Structures

Add the following sub-clause:

"f) the dimensions of excavations (including those in rock) shall be in accordance with the details or typical cross-sections shown on the drawings, as may be further defined or amended by the engineer during construction. All excavations carried below the designated level shall be backfilled with suitable approved subgrade material as defined in PSD3.2.1.

"g) strip foundations and encasement of pipes shall be cast directly against excavated surfaces. The engineer reserves the right to order removal of material under foundations and or floors that he deems unsuitable for bearing the relevant structures. Such material will be removed to the ordered depths and disposed of as directed. The created voids will be refilled and treated as ordered by the engineer.

PSD5.2.2.3 Disposal

Add the following:

“material arising from excavations that is unsuitable for use in any part of the works or surplus to requirements shall be spoiled at points designated by the engineer and in a manner satisfactory to him. Spoil heaps shall not be compacted but shall be spread, shaped, and given a free draining smooth surface.”

PSD5.2.2.4 Selection and use of Excavated Material (new sub-clause 5.2.2.4)

Add the following new sub-clause:

“selection and use of excavated material. All suitable and approved material excavated, shall, as far as is practicable, be used in the construction of embankments, backfill to excavations, engineered earth mattresses and for such other purposes as may be shown on the drawings or as directed. The contractor shall so plan his operations, in order that all excavated material is used in the manner that, in the opinion of the engineer, is most appropriate.

The contractor shall conserve all suitable materials and he shall not borrow, spoil or waste any material without approval. If a material selected by the engineer for a particular purpose becomes contaminated, is incorrectly used, or becomes unavailable through injudicious planning of excavation or borrow pit operations, the contractor shall replace the contaminated material and make good any shortfall with material of at least equal quality, at his own expense.

Where sufficient quantities of suitable excavated material are not available, additional material shall be obtained from existing stockpiles on the site or from borrow pits, as directed.”

PSD5.2.2.5 Temporary Stockpiling of Materials (new sub-clause 5.2.2.5)

Add the following new sub-clause:

“temporary stockpiling of materials. Where the earthwork programme is such that selected material cannot be placed directly in the appropriate position or windrowed on the edges of the excavation, the engineer may authorise the removal of such material to temporary stockpiles.

PSD5.2.2.6 Excavation Limits for Payment Purposes (new sub-clause 5.2.2.6)

Add the following new sub-clause:

“excavation limits for payment purposes. Limits for excavations shall be as detailed on the drawings. Where no such are indicated and outside shuttering is required or instructed by the engineer, the limit for excavation for payment purposes shall be 0.6m additional to each side of the concrete member under consideration.

PSD5.2.3 Placing and Compaction

PSD5.2.3.1 Embankments (5.2.3.1)

Add the following:

“given the nature of the site and the proximity of structures and services to the works, special precautions will frequently be required during the construction of embankments to avoid damage to, or unequal loading on, adjacent structures or services and the use of heavy earthmoving and compaction equipment may be precluded. In any such zone, within 2.5 m of any structure or service, the embankment shall comprise selected fine material with not more than 10% greater than 50 mm maximum dimension, placed in layers of not more than 200 mm thickness, compacted to not less than 93% of modified AASHTO maximum density. In such cases, the placing and compacting of embankments will be classified as restricted.

Where embankments are to be constructed under sloping floors of buried tanks which have not yet been constructed, the final 2.5 m of the embankment around the perimeter of the tank shall be compacted to 95% of modified AASHTO maximum density in layers not exceeding 200 mm and the layers shall be benched to the approximate slope of the sloping floors, approximately 150 mm inside of the outer perimeter of the tank. After compaction, the benched slopes shall be neatly trimmed back to a smooth even surface to the exact perimeter and slope of the sloping floors.”

PSD5.2.3.2 Backfilling (5.2.3.2)

delete paragraph b) and replace with the following:

- "b) restricted. Where fill is to be placed against structures or services, the engineer will define a zone of restricted placing, generally within 2.5 m of any concrete face or service. In any such zone, no heavy earthmoving or compaction equipment will be permitted and the fill shall comprise selected fine material with not more than 10% greater than 50 mm maximum dimension, placed in layers of not more than 200 mm thickness, compacted to not less than 93% of modified AASHTO maximum density.

PSD5.2.3.3 Screening (new sub-clause 5.2.3.3)

Add the following new sub-clause:

PSD5.2.3.3 Screening. Material in stockpiles to be utilised in the works which contains more than 5% by volume of hard material in excess of 0.03 m³ in size shall be coarse screened in the stockpile area to effectively remove all material with a maximum dimension in excess of 2/3 of the compacted layer thickness."

The contractor shall be fully responsible maintaining the grassed areas until the end of the maintenance period, which maintenance shall include watering, re-fertilising if required, re-planting of areas with an unacceptable cover, weeding, mowing and all other work required to ensure the establishment of a satisfactory grass cover. Maintenance shall also include the repair of erosion damage to grassed area which may occur prior to the establishment of a satisfactory grass cover.

Mowing shall be undertaken on established grass only using an approved power mower and edge trimmer. Mowing shall be to a height of 50 mm above the ground level until such time that a satisfactory cover has been established and thereafter to a height of 25 mm."

PSD5.2.3.4 Removal of Oversize (New sub-clause 5.2.3.4)

Add the following new sub-clause:

"PSD5.2.3.4 Removal of Oversize. Notwithstanding the provisions of SANS 1200 D sub-clause 3.2, with the exception of rock fill, the maximum dimension of hard particles in materials utilised for embankments, backfill, selected subgrade and engineered earth mattresses shall be limited to 2/3 of the compacted layer thickness.

The Contractor shall take all reasonable precautions not to place any material in the works which cannot be broken down to the specified size by normal processing of the layer being constructed. This shall be avoided by proper selection of excavated, stockpiled or borrow material. Where oversize material is placed in the works, all such material which does not break down during processing (including grid rolling, where this is possible) shall be removed from the works before final shaping and compaction of the layer.

The tendered rates for the applicable earthworks items shall be deemed to include provision for the removal of up to 5% of oversize material without additional compensation to the Contractor, regardless of the method used to remove the oversize material.

Separate payment as "Removal of Oversize" shall be made where the quantity of oversize material exceeds 5%, except that when the quantity of material in excess of 0.03 m³ in size exceeds 5% by volume, the material shall be screened and paid for as such."

PSD5.2.4 Finishing

PSD5.2.4.3 Grass or other vegetation. (5.2.4.3)

Add the following:

"The Contractor shall, using the services of an approved laboratory, establish the type and application rate of fertiliser most suitable for the prevailing soil conditions on site. The fertiliser shall be applied at the recommended rate and thoroughly mixed into the soil by raking or harrowing.

The type of grass to be established shall be Kikuyu or to match existing, which shall be planted in pre-prepared moist soil using the method of continuous root planting in rows that are not more than 200 mm apart. The grass shall be watered and the area rolled as the planting proceeds.

Stockpile sites shall be prepared by clearing and light grading and the area occupied by the stockpile shall be shaped and tidied after removal of the stockpile.”

PSD5.2.5 transport for earthworks

PSD5.2.5.1 Freehaul (5.2.5.1)

Delete the contents of the sub-clause and replace with:

“the drawings show the boundaries of the site within which the whole of the works is to be carried out and all haul within these limits plus an additional distance as indicated in the bill of quantity shall be regarded as freehaul.”

PSD5.2.5.2 Overhaul (5.2.5.2)

Delete the contents of the sub-clause and replace with:

“transportation of all excavated material beyond the freehaul distances applicable will be regarded as overhaul. Items are provided in the bill of quantity for this.”

PSD8 MEASUREMENT AND PAYMENT

PSD8.3 Scheduled items

PSD8.3.1 Clear Site

Delete the pay item, including the description thereof and replace with the following:

“8.3.1 Clear SiteUnit: m2

The rate shall cover the cost of clearing the designated areas as specified in clause psd5.2.1.1 and for placing the cleared material in windrows along the boundaries of the designated areas, or disposing of the material in designated spoil sites, as instructed.”

PSD8.3.2 Bulk Excavation (8.3.2)

Add the following sub items to psd8.3.2:

“8.3.2 Bulk Excavation

c) extra over 8.3.2(a) for soil cement backfilling where ordered by the engineer Unit: m3

The tendered rate for sub item above shall be additional to the rates tendered for and items will be provided in the bill of quantities. Rate shall include trimming and compaction of the excavations prior to placement.

d) excavate and dispose of unsuitable material from excavation bottom. nit: m3

The rate shall include the costs of complying with all precautions required in excavations and disposal as detailed in specific items.

e) extra over 8.3.2(a) for trimming and compacting terraces..... nit: m3

The rate shall include for trimming and compacting horizontal and sloping sides of the terraces before top-soiling and grassing including the removal of large stones and rubbish for an even surface.

PSD8.3.3 Restricted Excavation

Replace the words "in 1 m increments" at the end of the first sentence of sub-item (a) with "in the increments indicated in the schedule of quantities".

Add the following sub items to psd8.3.3:

Restricted excavation shall be limited to those detailed on the drawings or as agreed by the engineer.

- c) extra over 8.3.3(a) for soil cement backfilling where ordered by the engineer. unit: m³

The tendered rate for sub item above shall be additional to the rates tendered for and items will be provided in the bill of quantities. Rate shall include trimming and compaction of the excavations prior to placement.

- d) excavate and dispose of unsuitable material from excavation bottom. nit: m³

The rate shall include the costs of complying with all precautions required in excavations and disposal as detailed in specific items.

- e) extra over 8.3.3(a) for trimming and compacting terraces..... nit: m³

The rate shall include for trimming and compacting horizontal and sloping sides of the terraces before top-soiling and grassing including the removal of large stones and rubbish for an even surface.”

PSD8.3.4 Importing of Materials:

Delete sub-item a) and replace with the following:

- “a) importation of materials from stockpiles for use in:

- i) backfill or embankmentsUnit: m³
- ii) selected sub gradeUnit: m³
- iii) engineered earth mattressesUnit: m³

- b) importation of materials from commercial sources for use in.....Unit: m³

The unit of measurement shall be the cubic metre of material excavated from stockpiles on the site, whether existing stockpiles or stockpiles created by the contractor, or designated borrow pits, measured in place after compaction of the layer in question.

The rate shall include full compensation for all costs relating to the excavation of materials material from stockpiles or borrow pits and loading, transporting, placing, spreading and compacting the material. The rate shall also include full compensation for all costs relating to the assessment and selection of the material, including the cost of all testing to prove the quality of the material, all in accordance with the relevant specifications.

In the case of sub-item (a)(i), the rate shall also include full compensation for preparing, watering, processing and compacting the material and for final grading and complying with the requirements for layer tolerances.”

PSD8.3.5 Excavation in all materials to provide working space around structures

Delete this sub-clause and refer to sub-clause psd5.2.2.6

PSD8.3.8. Existing services

- PSD8.3.8.1 c) excavate by hand in soft material to expose existing services m³

Add the following to psd8.3.8.1 (c)

“excavation by hand to expose existing services shall only be measured and paid for if ordered by the engineer and shall be that depth within 300mm of the service irrespective of the depth. The balance will be measured as normal excavation.”

PSD8.3.11 Grassing or other Vegetation cover

Add the following:

“half of the payment under 8.3.11 will become due when the planting is completed and the remaining half will become due when a satisfactory cover has been established.” The rate shall also include supplying and spreading of a fertilizer.

PSD8.3.14 Restricted Placing (new payment item 8.3.14)

Add the following new payment item:

restricted placing, extra-over
Psd8.1.2, psd8.1.3 and psd8.1.4Unit: m³

The unit of measurement shall be the cubic metre of compacted material placed under restricted conditions as defined in psd2.1 and psd5.2.3.
The rate shall include full compensation for all costs additional to psd8.1.2, psd8.1.3 and psd8.1.4 for any extra precautions or specialised methods or plant required to place, process and compact material under restricted conditions, including the trimming of embankments and all other requirements as specified in psd5.2.3.1.”

PSD8.3.15 Removal of Oversize (new payment item 8.3.15)

Add the following new payment item:

removal of oversize material Unit: m³

The unit of measurement shall be the cubic metre of oversize material removed from material utilised for backfill and embankments, in excess of 5% by volume, as specified in psd5.2.3.4.
The rate shall include full compensation for all plant, labour, materials and other related costs for the removal of the oversize material from the layer, loading, transport and disposal, all as specified in psd5.2.3.4. Only oversize material in excess of 5% by volume of the layer being processed will be measured for payment.”

PSD8.3.16 Screening (new payment item 8.3.16)

Add the following new payment item:

screening.....Unit: m³

The rate shall include full compensation for all plant, labour, materials and other related costs for the screening of material for use on the works, as specified in psd5.2.3.3.”

PSD8.3.17 Overhaul (new payment item 8.3.17)

Add the following new payment item:

“8.3.17 overhaul

a) OverhaulUnit: m³.km

The rate shall include full compensation for the transport of materials beyond the freehaul distance as specified in bill of quantity.”

PSD8.3.18 Dewatering of Foundation excavation (As per SANS 1200A 5.5)

add the following new sub-clauses

The clause shall be as for SANS 1200A 5.5 and shall cover all costs as required to complete the works”

PSD8.4 Subsoil Drain under Structures

add the following new sub-clauses

PSD8.4.1 pipes in subsoil drains

- a) Perforated or slotted uPVC pipes c/w couplings (state size) Unit: m
 - b) uPVC fitting (state size and type)..... Unit: no
- “the rate shall cover the cost of supplying and installing the pipe or pipe fittings in a stone bed or no-fines concrete as indicated on drawings or instructed.

PSD8.4.2 crushed stone in subsoil drains.....Unit: m³

“the rate shall cover the cost of supplying, transporting irrespective of distance and placing the stone in the subsoil drain as indicated on drawings or instructed.

PSD8.4.3 Synthetic Filter Fabric in subsoil drainsUnit: m²

“the rate shall cover the cost of supplying, transporting irrespective of distance and placing the geotextile blanket in the subsoil drain as indicated on drawings or instructed.”

PSD8.4.4 dewatering of foundation excavations lump sum

Payment will be made as a lump sum for each affected structure or series of structures as scheduled in the bill of quantity. Rate to include for all compensation required for keeping the excavations dewatered, dry and silt and mud free as specified in sub clause psd5.2.7.

PSD8.4.5 No fines concrete in subsoil drainsUnit: m³

“the rate shall cover the cost of supplying, transporting irrespective of distance, mixing and placing the no fines concrete in the subsoil drain.

PSD8.4.6 Test flushing of pipes in subsoil drainsUnit: no

“the unit of measurement shall be the number of tests satisfactorily completed on unblocked sections of drain. No payment will be made for tests which have to be repeated due to blocked pipes or faulty workmanship. The tendered rate shall include full compensation for the provision of a water tanker, water, equipment and labour necessary to carry out the tests, complete as specified.

PSDB: EARTHWORKS (PIPE TRENCHES)

PSDB1 SCOPE

Add the following

“This specification also includes cable trench excavation”

PSDB2 INTERPRETATION

PSDB2.2 Application

Substitute “pipe trenches” with “pipe and cable trenches”

PSDB3 MATERIALS

PSDB3.1 Classes of excavation

Replace Clause 3.1 with:

“The excavation of material will, for the purposes of measurement and payment be classified as specified in Clause PSD 3.1.1 of the Project Specification.”

PSDB3.5 Backfill material

Add the following to paragraph (b):

“These requirements shall apply to any paved area, whether subject to loads from road traffic or not.

In all other areas, backfill material shall have a minimum California Bearing Ratio (CBR) of 3% at 90% of modified AASHTO maximum density, except in the final 300 mm, which shall have a CBR of 7% at 90% of modified AASHTO density.

Backfill material can be obtained from trench and structure excavation.”

PSDB5 CONSTRUCTION

PSDB5.1 Precautions

PSDB5.1.2 Stormwater, Seepage and Dewatering of Excavations

Substitute with the following:

“The costs of dealing with water shall be deemed to be included in the tendered rates for excavations and no additional payment shall be made in this respect.”

PSDB5.1.2.2 Special Water Hazards

Replace with the following:

Where ground water is present during construction to such an extent that, in the opinion of the Engineer, it would hamper the placing and consolidation of the granular or concrete bedding, as the case may be, or would cause buoyancy of the pipes, the Engineer may order the provision of a drain in the bottom of the trench to assist with dewatering during the construction and until the trench has been backfilled to such an extent that buoyancy of the pipeline will be prevented.

The drain shall be constructed over the full width of the trench as follows:

- Place filter cloth (Kaytech A4 or similar) to cover the trench bottom and part of the vertical trench sides.
- Place and compact 300mm thick 13mm crushed stone bedding.
- Cover the stone bedding with the installed filter cloth to a minimum overlap of 300mm.

At points designated by the Engineer, sumps shall be formed from which ground water can be pumped to maintain the water table below the pipe bedding level. The Contractor shall, if instructed, establish on site, operate and remove on completion, a dewatering pump of 10 l/s minimum capacity as per the requirements of Item 8.3.4(b) of 1200 DB. Lengths of trench opened at any one stage shall be limited by the dewatering capacity of the pump.

PSDB5.1.4 Existing services that intersect or adjoin trenches

Where any existing service occurs within the specified trench excavation, and the presence of such service is known before being uncovered, then the protection of the service will be scheduled and measured as provided for in Clause 8.3.5 of 1200DB. Only known services (as defined in Clause 5.4 of 1200A) shall be measured for payment.

Where an unknown existing service is damaged during construction, and the Engineer orders that the Contractor should undertake the repair of such service, then such repair will be measured and paid as dayworks.

No construction activity which may affect the integrity of telephone or electrical poles or stays may be carried out without the prior written approval of the Engineer, which approval shall only be given subject to the acceptance of a *modus operandi* that will ensure the integrity of such structures during construction.

PSDB5.1.5 Hand Excavation

Add the following:

“Certain trenches will have to be excavated by hand due to space limitations. The Contractor is to comply with all Occupational Health and Safety Act requirements in executing such
”

PSDB5.2 Minimum Base Widths

Substitute paragraph (b) with the following:

“The minimum trench base width shall be 600mm plus nominal diameter of pipes irrespective of the depth. Subsurface drain trench widths shall be 400mm.

The minimum cable trench width base shall be 300mm except where more than one cable is laid where the base width will be 300mm plus the distance between cables which shall be 50mm”

PSDB5.4 Excavation

Add the following:

The Contractor will be required to follow a procedure, whereby laying, jointing, testing and backfilling for each section of the pipeline will follow soon after trenching, and he will not be permitted to open up lengths of trench far in advance of pipelaying and backfilling operations. If in the opinion of the Engineer, trenching has proceeded too far ahead of pipelaying and backfilling, the Engineer shall have the right to stop trenching until the pipelaying and backfilling has caught up and the Contractor shall not be entitled to any extra payment due to this instruction.

PSDB5.6 Backfilling

PSDB5.6.3 Disposal of Soft Excavation Material

Add the following:

“Excavation material from pipe trenches that cannot be incorporated in adjacent fills and embankments for whatever reason shall:

- a) if suitable for use elsewhere in the works be classified and stockpiled in the appropriate designated stockpile site, or
- b) if unsuitable, be disposed of in an approved spoil site.”

PSDB5.9.2 Private Property and Commonage

Delete the first and second sentences of the sub-clause and replace with:

“Where instructed, the top 150 mm of each trench that is not subject to loads from road traffic or which does not fall within any paved area, shall comprise lightly compacted topsoil, such as is available, and shall be finished approximately 75 mm proud of the adjacent ground surfaces to allow for settlement. Otherwise, the top 300 mm of such trenches shall comprise material with a CBR of 7% at 90% of modified AASHTO maximum density, compacted to a minimum of 93% of modified AASHTO maximum density.”

PSDB5.9.4 Bitumen Roads: Subbase and Base

Delete the second paragraph, starting “If the surface of a road .” and ending “ 98% of modified AASHTO density.”

Add the following:

“All existing roads shall be opened to traffic as soon as possible. The completion of backfilling and the reinstatement of the layer work where pipe trenches affect existing roads shall therefore receive priority. The reinstatement of asphalt surfaces may however be delayed until it is practical to undertake the construction of the surfacing.”

PSDB5.9.7 Concrete Block Paved Roads (New Sub-clause 5.9.7)

Add the following new sub-clause:

“5.9.7 Concrete Block Paved Roads. The reinstatement of the base and Subbase of concrete block paved roads shall be undertaken as per SANS 1200 DB 5.9.4, as amended in PSDB2.2.2, except that the base shall be finished to the same level as the adjacent existing undisturbed base. The completed base shall be permitted to dry out for a maximum period of 24 hours, after which the bedding sand shall be placed, levelled and tamped and the precast concrete blocks laid, all in accordance with SANS 1200 MJ. An approved quick drying prime may be applied prior to the placing of the bedding sand if so instructed.

After completion of the reinstatement until the end of the maintenance period, the reinstated block paving shall be monitored and any unacceptable settlement rectified immediately at the Contractor’s cost.”

PSDB7 TESTING

Renumber sub-clause “7.1” as “7.2” and insert the following new sub-clause 7.1:

“7.1 During the backfilling of the trench, the Contractor shall undertake sufficient density tests on each layer of backfill above the bedding material to prove that the specified density of the backfill has been achieved. Provision for the cost of such testing shall be deemed to be included in the rates for the relevant scheduled items and no additional payment will be made.”

Delete the first sentence of the old sub-clause 7.1 (now 7.2) and replace with the following:

“As part of the quality assurance programme, the Engineer may order additional density tests to confirm the Contractor’s test results.”

PSDB8 MEASUREMENT AND PAYMENT

PSDB8.1 Basic principles

Delete Clauses 8.1.1 and 8.1.2 and replace with :

PSDB8.1.1 “8.1.1 The basic principle of measurement and payment for earthworks for a pipe trench is that the rates tendered for excavation shall cover the cost of excavation and the re-use of the excavated material for bedding and backfilling and the disposal of any surplus material within the Freehaul distance as specified in SANS 1200 D, as amended herein.

PSDB8.1.2 8.1.2 The following shall apply to the measurement of excavations for trenches:

- a) Trench excavations for pipelines, drains, cable, ducts etc. will be measured volumetrically.
- b) Separate items will not be scheduled for varying depths.
- c) Depth will be measured from the surface of the ground along the centre line of the trench to the bottom of the specified bedding layer (if any). (See Drawings DB-3 and DB-4). The ground surface will be that existing after any bulk earthworks have been carried out, i.e. the excavated surface or embankment surface unless a different sequence of execution has been ordered.

PSDB8.3 Scheduled items

PSDB8.3.2 Excavation

Delete the first sentence of the description of payment item (a).

Delete payment item (b), excluding the description, and replace with the following:

“b)Extra Over Item (a) above for hard rock excavationUnit: m³

PSDB8.3.3 Excavation Ancillaries

PSDB8.3.3.1 Make up deficiency in backfill material from

Add the following sub-item :

“d) by importation from stockpiles on siteUnit: m³
The rate for material from stockpiles shall cover the cost of excavation in stockpiles, and selection of suitable materials, loading, transport to the required position, offloading and the disposal of any material that becomes surplus as a result of the importation, all within the Freehaul distance.”

PSDK GABIONS AND PITCHING

PSDK3 MATERIALS

PSDK3.2.1 Stone

Replace the contents of table 2 with the following:

"TABLE 2 SIZE AND MASS OF INDIVIDUAL STONES FOR PITCHING

1	2	3	4
Size/mass of pitching	Thickness of pitching mm, min	Least dimension mm, min	Mass kg, min
Extra heavy	600	300	180
Heavy	400	190	50
Medium	300	150	27
Light	200	110	11

PSDM EARTHWORKS (ROADS, SUBGRADE)

PSDM3 MATERIALS

PSDM3.2 Classification for Placing Purposes

PSDM3.2.2 Fill

In paragraph (b), delete the last part of the sentence reading “. . . more than 600 mm.” and replace with the following:

“more than the lesser of 300 mm and 2/3 of the specified compacted layer thickness.”

PSDM3.2.3 Selected Layer

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

(b) Unstabilized selected layer

(i) Upper selected layer

Minimum CBR at 93% of modified AASHTO density: 15

Maximum PI: 12 (the Engineer has the right to alter this requirement to 3 x the grading modulus + 10)

(ii) Lower selected layer

Minimum CBR at 90% of modified AASHTO density: 7

Maximum PI: 12 (the Engineer has the right to alter this requirement to 3 x the grading modulus + 10)

(c) Stabilized selected layer

Minimum grading modulus of natural material: 0,75

UCS of stabilized material 300 kPa - 500 kPa at 93% of modified AASHTO density

Maximum PI for stabilized material: 10"

PSDM4 PLANT

Add the following new sub-clause:

“4.2 The right is reserved to restrict or prohibit the use of heavy vibratory compaction equipment should such plant be found to interfere with or otherwise negatively affect the operation of the existing water care facilities or cause damage to adjacent structures or services. In the event of such a restriction or prohibition the Contractor shall have no right to any claims of any nature.”

PSDM5 CONSTRUCTION

PSDM5.1 Precautions

PSDM5.1.2 Accommodation of Traffic

Add the following:

“The Contractor may not commence construction activities before adequate provision has been made to accommodate plant traffic to the satisfaction of the Engineer. Details of the Contractor’s proposals regarding the accommodation of traffic, including detailed layout drawings, are to be submitted to the Engineer for approval at least 48 hours prior to commencing the affected works. Failure to maintain road signs, warning signs or flicker lights, etc, in a good condition shall constitute ample reason for the engineer to bring the works to a stop until such have been repaired to his satisfaction.”

PSDM5.2 Methods and procedures

PSDM5.2.2.6 Catchwater mounds and channels and mitre banks and channels

Add the following sentence:

"Catchwater mounds and mitre banks shall be compacted to a minimum density of 90% of modified AASHTO density."

PSDM5.2.3 Treatment of the Road-Bed

PSDM5.2.3.2 Removal of unsuitable ground

Replace the second sentence of paragraph (a) with the following:

"The excavated spaces shall then be backfilled with approved imported material compacted to the required density."

Add the following sentence to paragraph (b):

"Unsuitable excavated material will be paid for as cut to spoil."

PSDM5.2.3.3 Treatment of road-bed

In paragraph (b)(1), delete items (i) and (ii) and insert the following directly after “directed”:

“The depth below formation level for both ripping and drilling and blasting shall be at least 300 mm in the centre of the road and at least 500 mm at the edges.”

PSDM5.2.4 Fill

PSDM5.2.4.2 Placing and Compaction

In paragraph (d)(1), change both references to 600 mm to “300 mm”.

In paragraph (g), change 90% to “93%”.

PSDM5.2.5 Selected Layer

Change the compaction requirement of “a) for material other than sand” from 93% to 95%.

Add the following:

“Where the in-situ material at Selected Subgrade level is of adequate quality for use as such, the material shall be treated in-situ by means of ripping to a depth of 150 mm, watering, mixing, shaping and recompacting. Where instructed by the Engineer, the Selected Subgrade material will be bladed to windrow to expose and treat the roadbed, prior to the construction of the in-situ Selected Subgrade.”

PSDM5.2.8 Transport

PSDM5.2.8.1 Freehaul

Delete the contents of the sub-clause and replace with the following:

“Freehaul shall be as defined in PSD5.2.5.1.”

PSDM5.2.8.2 Overhaul

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

“Overhaul shall be as defined in SANS 1200 D, sub-clause 5.2.5.2.”

PSDM6 TOLERANCES

PSDM6.3 Selected layer

Change the permissible deviations as follows:

- a) Formation level: +10 mm; –20 mm
- b) Thickness: + 5 mm; – 10 mm

PSDM7 TESTING

PSDM7.2 Process Control

Change the testing frequencies for Relative Compaction in Table 1 as follows:

- a) Ordinary fill: 250 m³
- b) Top 300 mm of fill and roadbed: 500 m²
- c) Selected layer: 500m²

PSDM8 MEASUREMENT AND PAYMENT

PSDM8.3 Scheduled items

PSDM8.3.6 Extra-over items 8.3.4 and 8.3.5 for excavating and breaking down material in: (8.3.6)

Delete sub-items (a) to (d) and the first sentence of the description of the payment item and replace with the following:

- a) Hard excavationUnit: m³
- b) Boulder excavationUnit: m³

PSDM8.3.9 Over break of excavation in:

Delete sub-items (a) to (d) and replace with the following:

- a) Hard excavationUnit: m³
- b) Boulder excavationUnit: m³

PSG: CONCRETE (STRUCTURAL)

PSG1 SCOPE

This specification covers the requirements for water retaining structural concrete for civil engineering work.

PSG2.3 Definition

For purpose of this variation to the Standard Specification, all reinforced concrete structures at Hospital View will be regarded as water-retaining structures unless stated otherwise in the Project Specification. The Standard Specification shall be applicable to all other concrete structures not mentioned above.

PSG2.4.1 Exposure Conditions

For the purpose of this Specification, Water retaining structures shall be deemed to be classified under clause 2.4.1.3 (severe conditions) as specified in SABS 1200 G unless specified otherwise in the project specification.

PSG3 MATERIALS

PSG3.2 Cement

PSG3.2.1 Applicable Specifications

Delete Clause 3.2.1 and replace with:

"All cement types shall comply with the requirements of:

Common Cements

SANS ENV 197-1. Only CEM1 Portland cement shall be used in structural concrete in this contract."

Cement extenders

SABS 1491: Part I-1989 Ground granulated blast furnace slag

SABS 1491: Part II-1989 Fly ash

SABS 1491: Part III-1989 Condensed silica fume

PSG3.2.2 Alternative types of Cement

Only CEM II B-V shall be used in water retaining structures. The target Fly Ash content shall be 25-30%.

Other types of cementitious material may be used only if specifically approved by the Engineer.

PSG3.2.3 Storage of Cement

Delete the last line of Sub-Clause 3.2.3 and replace with:

"Cement for all Strength Concrete used in structural elements shall be stored in weatherproof silos. Cement drawn for use shall be measured by mass. The Contractor shall ensure that cement for Strength Concrete is not stored on Site for longer than six (6) weeks or in accordance with supplier specifications. Copies of all waybills for cement deliveries shall be submitted to the Engineer. Consignments of cement shall be used in the same sequence as that in which they are delivered to site."

PSG3.4 Aggregates

PSG3.4.1 Applicable Specifications

Delete the "." At the end of the first sentence and add the following:

“, subject to the following:

- a) The drying shrinkage of both the fine and coarse aggregate (sand) when tested in accordance with SANS Method 836 shall not exceed the following limits:
 - i) For use in water retaining structures and slender column, the shrinkage of both fine and coarse aggregate shall not exceed 125% of that of the reference aggregate.
 - ii) For use in other reinforced concrete structures or elements, the shrinkage of the fine aggregate shall not exceed 175% and that of the coarse aggregate 150% of that of the reference aggregate.

- iii) For use in mass concrete substructures and unreinforced elements, the shrinkage of both the fine and coarse aggregate shall not exceed 200% of that of the reference aggregate.
- b) The flakiness index of the coarse aggregates, as determined by TMH 1 Method B3, shall not exceed 35.
- c) Aggregates shall not contain any deleterious amounts of organics materials such as grass, roots, timber or other similar materials.
- d) The fineness modulus of the fine aggregate shall not vary by more than ± 0.2 from the approved modulus."

Add the following :

"Only Dolomitic aggregates (coarse and fine) will be approved for use in concrete utilised on the Works. After approval of the aggregates and prior to commencing production of concrete the Contractor shall ensure a continuous supply of the selected aggregate from the approved source. Any colour or texture variations of exposed concrete due to changes in aggregates during the Contract shall be rectified by the Contractor at his own cost. Any such remedial measures shall be approved by the Engineer before commencement thereof.

The following additional sub-clauses shall be applicable to water retaining structures:

PSG3.4.4 Fine Aggregate

Samples of the proposed fine aggregate shall be submitted to the Engineer for his approval before use.

The Contractor shall submit a sieve grading analysis to the Engineer for approval and if unacceptable, the Contractor shall offer another sample and grading for approval, or may blend aggregate from different sources and submit the blend for approval.

The water demand of the fine aggregate shall not exceed 195 ℓ/m^3 .

Fine aggregate shall be stored on a concrete surface and washed sand shall be allowed to drain for at least 24 (twenty-four) hours before use. The Engineer may require the Contractor to test the sand daily (or more frequently if necessary) for moisture content, impurities and grading before use.

PSG3.4.5 Coarse Aggregate

The voids ratio of the coarse aggregate shall not exceed 47 % (forty-seven per cent). Single sized aggregates shall be stored on a concrete surface in separate stock piles, according to size. The proportions of the various single sized aggregates required for the various portions of the work shall be submitted by the Contractor for the Engineer's approval.

PSG3.5 Admixtures

PSG3.5.1 Approval of Admixtures Required

Add the following:

"Admixtures, if the use thereof is permitted, shall comply with the following requirements:

- a) Admixtures shall be used only in liquid form and shall be batched in solution in the mixing water by a mechanical batcher capable of dispensing the admixture in quantities accurate to within 2% of the required quantity.
- b) All admixtures shall comply with the requirements of ASTM C494 or AASHTO M194 and shall be of an approved brand and type.
- c) Admixtures shall not contain any chlorides."

PSG3.5.2 Air-Entraining Agents

Add the following:

“Air-entraining agents shall comply with the requirements of ASTM C260 or AASHTO M154 and only used on the written approval of the Engineer”

PSG3.9 Jointing Materials (New clause 3.9)

Insert the following new Clause:

3.9 Jointing Materials

- a) Waterstops shall be a proprietary design consisting of flexible polyvinylchloride with at least the following properties:
- | | | |
|--------------------------------------|---|---------------|
| Tensile strength | : | 15 MPa (min.) |
| Elongation at break | : | 250% (min.) |
| Hardness (ASTM D1706) | : | 70 ±5 |
| Cold crack temperature | : | - 25° C |
| Water absorption (48 hours at 50° C) | : | 0,5% (max.) |
- b) Joint sealer shall be a two-component polyurethane base sealing compound or an equal and approved sealer. The joint sealer shall have a movement tolerance of 25% (min.) and shall be capable of withstanding extension and compression over a wide range of moisture and temperature conditions without deterioration. Two components polyurethane sealers shall comply in all respects with SANS 1077.
- c) Joint filler shall be manufactured from a non-absorbent, closed cell, polyethylene and the filler strips shall be provided with a tear-off cover strip. The joint filler shall comply with AASHTO M153 and shall have a load bearing capacity of 0,2 MPa for 50% compression and a moisture absorption of not more than 3% by volume, all subject to the Engineer’s approval.”

PSG4 PLANT

PSG4.5 Formwork

PSG4.5.1 Design

Add the following to the end of Sub-Clause 4.5.1:

“The Contractor shall note that in respect of formwork, he is the “designer” in terms of the OHS Act, 1993 and he shall be fully responsible for the safe design, construction and dismantling of formwork, staging and falsework. In particular, the Contractor shall note the requirements of Section 10 of the Construction Regulations, 2003.

When requested, the Contractor shall submit his designs to the Engineer for approval at least 14 days prior to commencing erecting any formwork, staging or false work. Approval by the Engineer of the Contractor’s designs and details shall in no way relieve the Contractor of his responsibilities.”

The use of wooden formwork shall not be allowed for the construction of any visible surfaces on any structure. This requirement applies to all walls, columns, walkways and steps.

PSG4.5.2 Finish

Add the following:

Unless otherwise specified, the surface finish of all structural concrete on water-retaining structures shall be Smooth as defined in clause 5.2.1 (b).

“All external corners shall be chamfered by the fitting of fillet strips into the corners of the formwork to form 20mm x 20mm chamfers. Rate for formwork shall include cost of chamfering”

PSG4.5.3 Ties

Delete Sub-Clause 4.5.3 and replace with:

“The types of ties used and their positions shall receive careful attention and be subject to the approval of the Engineer. Ties shall not be left embedded in the concrete closer to the face of the concrete than the minimum specified cover to reinforcement.

Permanent metal ties shall have a minimum cover of 40mm after formwork removal. Tie holes shall be filled with an approved cementitious grout to the same strength as the member concrete. Trial mixes shall be made to arrive at the required working consistency”

PSG5 CONSTRUCTION

PSG5.1 Reinforcement

PSG5.1.2 Fixing

The use of plastic spacer blocks will not be allowed. Concrete spacer blocks, of same mix design as the strength concrete, shall be used.

“The Engineer will inspect the reinforcing after it has been fixed in place, the formwork has been cleaned, cover blocks have been positioned, and before concreting commences.

Welding of reinforcing steel will not be permitted.”

PSG5.1.3 Cover

In water retaining structures the exposure condition of a reinforcing bar closest to the face in direct contact with water or soil backfilling, shall be classified as severe.

It should be noted that in some water retaining structures only one face of the structural elements will be in contact with water.

The nominal concrete cover is generally 50mm, unless otherwise specified on the Drawings.

The soffit of a slab suspended above the water (e.g. a reservoir roof) will be treated as being in contact with the water for the purpose of determining the cover.

PSG5.2 Formwork

PSG5.2.1 Classification of Finishes

Add the following to paragraph (b):

“After the repair of imperfections, which shall be undertaken immediately on removal of the formwork, all surfaces designated to have a smooth surface finish shall be wetted and rubbed. Rubbing shall be undertaken first with a coarse carborundum stone followed by a smooth carborundum stone, or other similar abrasive until a uniform colour and texture is produced and shall be completed within 24 hours after the removal of the formwork. No cement grout or slurry shall be used other than the cement paste drawn from the green concrete by the rubbing process. The character of the materials used and the care with which forms are constructed and concrete placed are factors in determining the amount of rubbing required.”

PSG5.4 Pipes and Conduits

Add the following:

“All pipes and specials which must be installed in floors and walls of structures shall be embedded in concrete during casting. No holes shall be left for later installation unless with written approval of the Engineer. The Contractor shall be responsible for the grouting in all pipe and specials that are installed using the later method and in accordance with clause PSG4.5.3 of the specifications”

PSG5.5 Concrete

PSG5.5.1 Quality

PSG5.5.1.4 Chloride Content

Delete the sub-clause and replace with :

“The amount of chloride ion in concrete expressed as a percentage by mass of the cement shall not exceed 0.20%.”

PSG5.5.1.5 Durability

Delete the sub-clause and replace with :

“The exposure conditions for all water retaining structures, structures below ground etc. shall be considered as being ‘severe’ and for superstructures of buildings as being ‘moderate’, for which exposure conditions the maximum water/cement ratio shall be:

- a) severe : 0.43 – 0.48
- b) moderate : 0.53,

PSG5.5.1.7 Strength Concrete

Delete the contents of the sub-clause and replace with:

“The Contractor shall be responsible for the design of Strength Concrete and shall appoint an approved materials laboratory to prepare and test all Strength Concrete designs on his behalf.

The Strength Concrete to be utilised on the Contract for water retaining structures or where indicated shall be Class 35/19 and shall conform to the following requirements:

- a) The characteristic strength of the mix shall be the highest of the following:
 - i) the specified 28-day characteristic cube compressive strength (i.e. 35 MPa);
 - ii) the characteristic cube compressive strength corresponding to the specified maximum water: cement ratio;
 - iii) the characteristic cube compressive strength corresponding to the specified minimum cement content.
- b) Only dolomitic aggregates (fine and coarse) may be utilised in the mix.
- c) The cement content shall not be less than 400 kg/m³ and not greater than 500 kg/m³.
- d) The water: cement ratio shall be less than 0.48.
- e) The slump shall conform to the requirements stated in SANS 1200 G Table3.
Mass concrete and minor structures may have lower concrete strength and will be indicated on drawings or instructed by the Engineer.
Before starting with any concrete work on the site, the Contractor shall submit for approval, samples of the constituent materials of the concrete and a statement of the mix proportions which he proposes to use for each class of concrete indicated in the schedule of quantities.
The samples shall be accompanied by evidence that both the constituent materials and the proposed mix comply with the specifications, which evidence shall be in the form of:
 - i) A copy of all test results on both the constituent materials and the mix itself, plus a statement regarding the test results, furnish by the approved materials laboratory, or
 - ii) An authoritative report on the previous use, experience and performance of both the constituent materials and the proposed mix.
Where any change occurs in the materials sources, aggregate sizes, or any other component of the concrete, the above procedures shall be repeated at the Contractor’s cost.
The actual mix proportions used as well as any changes thereto shall be subject to the Engineer’s approval, but such approval shall in no way relieve the Contractor of his responsibility for producing concrete with the specified properties.”

PSG5.5.1.8 No Fines Concrete

Add the following new sub-clause:

“5.5.1.8 No Fines Concrete.

No fines concrete shall consist of a mix of 50kg cement and 0,30 m³ of approved dolomitic coarse aggregate with a water/cement ratio of approximately 0,46. The aggregate shall be so graded that not more than 10% by mass is retained on a 19mm sieve and not more than 5% by mass passes a 6,7mm sieve.

The quantities of water used shall be just sufficient to form a smooth grout to completely coat all surfaces of the aggregate.

Curing shall be as per Clause 5.5.8 of SANS 1200 G.”

The sheeting found between the no fines drainage layers shall consist of a suitably compounded low density polyethylene. This lining material shall be welded together on site using a continuous extrusion fusion welding system to ensure totally integrated and homogenous joints, which when tested shall fail neither in shear nor peel test modes, as per Appendix D-4.6 of SANS 1526-1991

(a) Classes of no-fines concrete

No-fines concrete shall be classified by the prefix NF and the size of aggregate to be used. Class NF 19 means a no-fines concrete with a 19 mm nominal size aggregate.

The volume of aggregate per 50 kg of cement for each class of concrete shall be as follows:

Class	Aggregate per 50 kg cement
NF 38	0,33 m ²
NF 19	0,30 m ²
NF 13	0,27 m ²

(b) Batching and Mixing

Cement shall be measured by mass or in full pockets of 50 kg each and aggregate shall be measured by volume in approved measuring boxes or barrows.

The aggregate shall be moist or wetted before the cement is added. Where drum mixers are used, about 50% of the water shall be poured into the drum before the aggregate and cement are loaded. The mixing time in the drum shall be about 45 to 50 seconds.

The quantity of water added shall be just sufficient to form a smooth grout which will adhere to and completely coat each and every particle of aggregate, and which is just wet enough to ensure that, at points of contact of aggregate, the grout will run together to form a small fillet to bond the aggregate together. The mix shall contain no more than 20 liters of water for every 50 kg of cement.

Mixing shall be done in an approved batch-type mechanical mixer, but small quantities may be hand-mixed.

(c) Placing

No-fines concrete shall be placed in accordance with the procedure approved by the Engineer. It shall be placed in its final position within 15 minutes of having been mixed.

The concrete shall be worked sufficiently to ensure that it will completely fill the space to be concreted and that adjacent aggregate particles are in contact with one another. Excessive tamping or ramming shall be avoided and under no circumstances shall the concrete be vibrated.

(d) Protection

All no-fines concrete shall be protected from the elements and loss of moisture. Protection against loss of moisture shall be accomplished by one or more of the following methods:

- Retaining formwork in place

- Covering exposed surfaces with sacking or other approved material kept continuously wet
- Covering exposed surfaces with plastic sheeting

No-fines concrete placed during cold weather shall be adequately protected against frost for at least 3 days.

PSG5.5.2 Batching

PSG5.5.2.1 Cement

Delete the sub-clause and replace with the following:

“Cement shall only be supplied from bulk storage silos and shall be mass batched to an accuracy of within 2% of the mass required.”

PSG5.5.2.3 Aggregates

Delete the sub-clause and replace with the following:

“The required mass of each aggregate size shall be determined, a correction made for the moisture content of the aggregate and the aggregates mass batched to an accuracy of within 3% of the required mass.”

PSG5.5.5 Placing

Delete Sub-Clause 5.5.5.6 and replace with :

“For closed circuits such as circular or rectangular water retaining structures for which no vertical joints have been detailed on the drawings, work shall commence at one or more points in the circuit and proceed in opposite directions at the same time so that on completion of the circuit the junction or junctions are formed with freshly placed concrete. The height of the lift shall be carefully pre-planned so that the concrete can be placed in one continuous operation over the entire perimeter of the wall. No unauthorised vertical or inclined construction joints of any kind will be permitted in continuous walls.”

Delete the “.” At the end of the first sentence of sub-clause 5.5.5.9 and insert the following:

“and shall be conditional on full compliance with the provisions of Clause PSG3.3.1.4 and confirmation that the durability and water tightness of the component will not be reduced.”

PSG5.5.6 Compaction

Delete the first sentence of sub-clause 5.5.6.1 and replace with the following:

“The concrete shall be fully compacted by means of mechanical poker vibrators during and immediately after placing, except in concrete floors or pavements where a combination of mechanical poker vibrators and a vibrating screed beam shall be utilised.”

PSG5.5.7 Construction Joints

Delete the contents of Clause 5.5.7 and replace with:

“5.5.7.1 Special Note. Construction joints are a potential source of weakness in the strength, water tightness and appearance of a structure and they shall be positioned and treated with particular care.

5.5.7.2 Location.

- (a) Construction joints shall be located as shown on the drawings or to the approval of the Engineer. The spacing of joints shall depend on the volume of concrete that can be properly placed in a normal shift.
- (b) Construction joints shall be fixed in advance of the concreting operation.
- (c) In general construction joints shall be positioned at the points of maximum compression, minimum shear and at right angles to the main reinforcement.
- (d) Where smooth shutter finishes are specified the joints shall coincide with the edges of the shutter boards or panels.

(e) All joints shall be truly vertical or horizontal unless otherwise specified.

- 5.5.7.3 Emergency Stoppages. If because of an emergency, such as a breakdown of the mixing plant or the onset of unsuitable weather, concreting has to be interrupted, concrete shall be finished off at the place of stoppage in the manner that will least impair the durability, appearance and proper functioning of the element being cast.
- 5.5.7.4 Vertical Joints. All vertical construction joints where specified shall have a shuttered face. The shuttering shall be fixed firmly in position and slotted to allow continuity of the reinforcing steel without loss of mortar at the joint.
- 5.5.7.5 Horizontal Joints. Unless otherwise specified or shown on the drawings all horizontal joints shall be formed by striking off the top 25mm of concrete approximately 1 hour after it has been compacted, working to the top of the line formed by the gauge strips specified in sub-clause 5.5.7.6 of PSG5.5.7, which follows.
- 5.5.7.6 Gauge Strips. To give all joints a straight-line finish where smooth shutter finishes are specified, 40mm x 40mm rebated gauge strips shall be fixed inside the shutters at the joint position and removed before the new concrete is cast.
- 5.5.7.7 Keyed Joints. Joints in beams and slabs shall have keyed faces to transmit shear.
- 5.5.7.8 Joints Parallel to Main Reinforcement. These joints shall be subject to the approval of the Engineer and shall be formed only when absolutely necessary. The Engineer may order additional splice bars and other load transfer devices to be provided at the joint. No extra payment shall be made for the additional material or labour if such construction joints are requested by the Contractor.
- 5.5.7.9 Column Joints. These joints shall be treated as in sub-clause 5.5.7.5 of this clause PSG5.5.7 except at joints with over sailing slabs or beams. In this case no perimeter rebate is required on the column and it shall project 25mm into the soffit of the slab or beam when the excess concrete has been struck off as described in sub-clause 5.5.7.5 of this clause PSG5.5.7.
- 5.5.7.10 Shuttering to Joint. To obtain a joint free from projections the shutters for the new concrete shall be tightly fixed to the existing concrete by means of additional bolts, wedges or clamps. In all possible cases the shutters shall overlap the joint and not be disturbed until the new concrete has hardened."
- 5.5.7.11 Before Placing Concrete
- Where the concrete of the previous lift is more than 3 days old, it shall be kept continuously wet for a period of 24 hours before the mortar and fresh concrete is placed.
- On all construction joints the following steps shall be taken after the surface has been prepared and at the most, 30 minutes before placing the concrete:
- (i) Remove all surface water with an air hose and dry sprinkle waterproofing additive (Vandex Premix or similar approved) at 9,8 kg per m².
 - (ii) Place a layer of approximately 10 mm thickness consisting of cement, sand and water mixed in the same proportions as used in the concrete.
 - (iii) Place concrete within 30 minutes.

PSG5.5.8 Curing and Protection

SABS 1200 G Clause 5.5.8 will be deleted for the purpose of this Specification and replaced with the following:

“All concrete other than blinding concrete shall be maintained continuously saturated for at least ten days or as directed on the drawings immediately after placement or after stripping formwork in the case of walls, by methods which shall receive the prior written approval of the Engineer if different from the following:

a) For floors

Ponded water with a minimum depth of 30 mm.

b) For Columns and Walls

Continuously saturated heavy jute sacking or other approved absorbent material maintained in contact with the concrete surface by fastenings spaced at not more than 2 m centres.

c) For Floors and Columns

Covering the previously saturated surfaces with approved plastic sheets maintained in contact with the concrete surface and with all edges and joints sealed by methods approved by the Engineer.

Where the ambient temperature is below 4°C the curing period of 10 days or as directed on the drawings, will be extended by 72 hours.

Newly cast concrete sections shall not be used for supporting loaded wheelbarrows, monorails, material or scaffolding, etc., until permission is obtained from the Engineer.”

PSG5.5.9 Adverse Weather Conditions

(a) Concreting in cold weather

During cold weather no material having a temperature below 5 °C shall be used for making concrete.

No concrete shall be placed when the ground or air temperature is below 2°C or if the ground or air temperature is likely to fall below 2° C within 6 (six) hours of placing the concrete.

The temperature of placed concrete shall not be allowed to fall below 5 °C until the concrete has attained a strength of at least 5 Mpa, and the Contractor shall be responsible for all the necessary protective measures to ensure this. All concrete that has been damaged by frost or by the formation of ice in the concrete shall be removed and replaced by the Contractor at his own expense.

(b) Concreting in hot weather

During hot weather, the temperature of the concrete, as placed, shall not exceed 30°C. The Contractor shall ensure that the placing of the fresh concrete does not exceed the ambient temperature by more than 5°C. Where necessary this shall be accomplished by shading aggregate stockpiles, shading or insulating water pipes and water storage tanks.

PSG5.5.10 Concrete Surfaces

Delete the contents of Clause 5.5.10 and replace with:

“5.5.10.1 Exposed surfaces of concrete not finished against forms such as horizontal or slightly sloping surfaces shall be brought up to a plane, uniform surface with suitable screed boards.

5.5.10.2 All non-formed concrete surfaces shall be finished to one or more of the following classes of finish:

- a) Screed Finish. Immediately after being poured the concrete shall be screed with a straight edge working between templates set accurately to line and level. No mortar shall be added to overcome surface irregularities. These shall be made good by re-screeding or by the addition of concrete.
- b) Wood Floated Finish. After screeding to line and level and when the water sheen has disappeared the concrete surface shall be trowelled by hand with a wood float to a uniform consolidated surface free from any trowel marks and uniform in texture and appearance.
- c) Steel Floated Finish. Commence as for (b) and finish with a steel trowel. The final finish shall be done at the correct time; the concrete shall still be sufficiently plastic to take a polish but have hardened sufficiently to prevent drawing water and fine materials to the surface. Any adherence of mortar to the steel trowel indicates that the correct stage has not yet been reached.
- d) Power Floated Finish. Commence as for (b) and after the concrete has hardened sufficiently it shall be power floated only sufficiently to produce a uniform, dense, smooth surface free from trowel marks. Bleed water shall not be reworked into the concrete but shall be allowed to evaporate off or be removed. Dryers in the form of neat cement or rich cement/sand mixtures shall not be used under any circumstances.

5.5.10.3 All non-formed concrete surfaces shall be finished to the tolerances specified for Degree of Accuracy II in terms of SANS 1200 G sub-clause 6.2.3(d), except for the following:

- a) Floors and top of outer walls to the sedimentation, clarifier and thickener tanks, shall be formed to the following tolerances:
 - i) Deviation from specified level: +0 mm; -5 mm
 - ii) Max. deviation under a 3 m straight edge: 3 mm
 - iii) Max. height of localised imperfections: 1 mm
- b) Screed topping to Archimedean screw pump trough which will be formed with the assistance of a tightly drawn wire across the flights of the rotating screw and where a tolerance on the surface of +0 mm; - 2 mm is required.
- c) Machine bases and other associated work within and in close proximity to structures housing plant and process equipment shall be finished to Degree of Accuracy I in terms of SANS 1200 G, sub-clause 6.2.3(d).

5.5.10.4 After finishing as specified, an approved proprietary surface hardener capable of withstanding chemical attack shall be applied to the internal surfaces of balancing tanks, digester tanks above top sludge level and any other surfaces identified by the Engineer, in accordance with the manufacturer's recommendations.

Details of the proposed surface treatment products shall be submitted to the Engineer for approval at least 14 days prior to commencing the activity."

PSG5.5.11 Watertight Concrete

Delete the contents of Clause 5.5.11 and insert the following:

"All reinforced concrete structures included in this Contract are water retaining structures and have been designed accordingly. Water retaining structures are subject to the provisions of the following Sub-Clauses:

5.5.11.1 Pipes and Conduits Embedded in Concrete.

Except with the written approval of the Engineer, no pipes other than those shown on the drawings shall be embedded in concrete and the approval of the Engineer for the position of all services to be embedded shall be obtained before concreting commences. The clear space between such pipes and reinforcement shall not at any point be less than

- a) 40mm or
- b) 5mm plus the maximum size of coarse aggregate, whichever is the greater

5.5.11.2 **Grouting of Pipes and Specials Through Walls.**

Where entry holes for pipes/specials have been provided in walls the Contractor shall be responsible for the grouting in of such pipes/specials, regardless of whether or not these have been supplied by himself.

Before commencing the positioning in holes of any pipes/specials the Contractor shall

- a) remove all shuttering and boxing remaining in the holes;
- b) make any alterations required to the position and shape of the holes;
- c) thoroughly clean the sides of the holes so as to obtain a satisfactory bond surface for the new concrete; and
- d) free all surfaces of the pipes/specials of all coatings, and thoroughly scrape and clean the pipes/specials.

After accurately positioning the pipes/specials in their respective holes, the Contractor shall fix the pipes/specials in the holes.

Immediately before grouting is carried out by the placing of mortar and concrete around the pipes, the surface of the existing concrete shall be saturated with water. All surplus water shall be removed and the surface covered with a layer, approximately 12mm thick, of mortar consisting of 3 parts of concrete sand and 1 part of cement.

The concrete ingredients shall be mixed and placed as dry as possible to obtain a dense, waterproof concrete. Where a watertight seal is required, the concrete shall be carefully worked around the puddle flange, if any, and the pipe barrel or body of the special, and shall be vibrated in layers so as to obviate any falling away from pipe/special surfaces of the concrete already placed. The whole shall, when set, form a dense, homogeneous, and waterproof mass. A spare vibrator with an independent power source shall be kept in readiness to ensure continuity of placing in the event of the breakdown of the duty vibrator. Smooth formwork that has been suitably strengthened for use with a vibrator shall be provided for facing the concrete around each pipe/special.

5.5.11.3 **Tests for Water tightness.**

Water for testing may be final effluent obtained from the adjacent Works.

Concrete work which is required to contain liquid shall not be accepted as complete until it has been proved by test to be watertight.

Neither backfilling around the Works up to original ground level nor banking around structures will be permitted until after the satisfactory completion of the appropriate stages of testing for water tightness in accordance with the provisions set out hereunder.

Water containing structures are to be tested for water tightness at four stages unless otherwise ordered by the Engineer; one at quarter-full depth of water, one at half-full, one at three-quarter-full and one at normal full level. In each case as soon as the water surface is reasonably steady after filling, the water level is to be established and recorded by means of a hook gauge to be provided by the Contractor, and thereafter is to be measured and recorded each successive 24 hours and the results graphed so as to establish a progressive rate of absorption and leakage.

To make allowance for variations caused by evaporation or rainfall in the case of un-roofed structures a watertight open-topped container of at least 2m² plan area by 1m deep 80% filled with water shall be floated on the water and moored. By taking measurements of the water level in the container, the losses or gains due to evaporation or rainfall will be assessed.

If the rate of leakage in the case of roofed structures or after making allowance for evaporation or rainfall in the case of un-roofed structures, at any stage exceeds 2mm per 24 hours at the end of 7 days in the case of the fourth stage, or if damp patches are apparent on the concrete face remote from the contained water, and there is no prospect, in the opinion of the Engineer, of the leakage reducing to tolerable limits, he shall have the right to deem the structure to be not watertight and to notify the Contractor accordingly, who shall take such steps at his own expense and to the approval of the Engineer, as may be considered necessary to achieve water tightness, other than by plastering. In the event of the measures taken by the Contractor proving ineffective in reducing the drop in water level over a period of 7 days to less than 2mm per 24 hours, and/or the apparent dampness externally to limits which are considered tolerable by the Engineer, he shall have the right to order the Contractor to plaster or coat with an approved product the floors and inside faces of walls and the Contractor shall at his own expense carry out this work to the approval of the Engineer.

The water tightness of the roof shall be tested before that of the reservoir itself by water being continuously sprinkled over the roof and in an approved manner so that a film of water is maintained on the surface of the slab. The roof shall be considered watertight if no damp patches are visible on the underside after 48hours of Sprinkling.

On completion of this work and after cleaning out the structure it shall again be tested in the manner specified at the Contractor's cost. If the retest fails to reveal a satisfactory degree of water tightness, the Contractor shall carry out such other measures at his own expense as may be directed by the Engineer.

In the event of leakage being evident at any time during the Maintenance Period, the Engineer before issuing the Final Certificate may call for further testing and rectification as already described and will have the right to withhold his Certificate until he considers the work to be satisfactory."

5.5.11.4 Construction Joints

Joints are the concrete at which special measures are taken to achieve subsequent continuity are termed construction joints. Construction joints will be permitted only where shown on the drawings or approved by the Engineer and shall be formed true to line on all formed or exposed surfaces. Horizontal joints shall be formed by casting against a timber or metal former. Recesses shall be formed as detailed on the drawings. Where detailed on the drawings, galvanized metal strips or waterbars shall be cast into the joints. No unplanned construction joints will be allowed. If a breakdown occurs, the contractor shall strip the shuttering as soon as possible and break out all concrete up to the previous planned construction joint.

Except in the case where movement joints are required, the entire joint contact area of the concrete already placed shall be thoroughly roughened by chipping with sharp chipping picks before placing concrete against the surface. This surface will not be accepted unless the coarse aggregate projects 5 mm beyond the surrounding matrix. In this connection approved light pneumatic or electric tools are preferred provided that no structural damage is done to the concrete being chipped: otherwise hand tools are to be used. Chipping shall not be commenced until at least 48 (forty-eight) hours after the concrete was placed.

Alternative methods of preparing the surfaces of construction joints to those given above will be considered. The Contractor shall submit proposed alternative methods of achieving the roughened surface required to the Engineer for approval.

Should the Engineer at any time withhold or withdraw permission for alternative methods to be used then the Contractor shall prepare the surfaces of construction joints in accordance with the above specification.

Immediately before the adjoining concrete is placed, the chipped surface shall be thoroughly cleaned by brushing and washing and then thoroughly wetted.

At the discretion of the Engineer the percentage of coarse aggregate of the mix may be slightly reduced in a layer not exceeding 200 mm in depth immediately above the chipped surface of a horizontal construction joint. Suitable temporary openings shall be left in the shuttering to allow for the removal of sawdust, shavings, nails, debris, etc.

The application of compounds to the surfaces of stop ends at vertical joints to retard the setting of a film of concrete in contact with the stop end will be permitted subject to the Engineer's approval of the compound to be utilized and the Contractor's methods for the application of the same.

5.5.11.5 Movement Joints

Movement joints shall be formed where shown on the Drawings.

Movement joints shall be formed true to line and shall be thoroughly cleaned of all accretions of concrete or other foreign matter by scraping or other approved means. The surfaces in contact with joint sealing material shall be prepared strictly in accordance with the manufacturer's Specification.

Care shall be taken to ensure that the waterbars are in perfect contact with well compacted void-free concrete throughout, particularly on horizontal joints where special procedures shall be adopted for placing and compacting concrete under the waterbars, to the approval of the Engineer.

5.5.11.6 Waterproofing of Concrete Joints (if specified)

Three different systems of waterproofing (or construction of systems) exist and the appropriate system (or combination) will be applied as specified on the drawings: The three systems are:

- a) Waterproofing with hypalon bandage system
- b) Waterproofing with waterbars
- c) Waterproofing with surface sealants

(i) Hypalon system

Hypalon bandage joint sealing system shall be the Sikadur-Combiflex Hypalon bandage system as supplied by Sika (Pty) Ltd.

The joint shall consist of 2 mm thick Combiflex Hypalon sheeting, 200mm and 250mm wide, as shown on the drawings. The Hypalon sheeting shall have a tensile strength of 6N/mm² and an elongation at failure of not less than 400%.

The Hypalon sheeting shall be bonded to the concrete with Sikadur 31 two component, solvent free, moisture intensive, high viscosity, epoxy paste adhesive.

(ii) Waterbars

Except where otherwise specified waterbars shall be manufactured from virgin polyvinyl chloride complying with BS 2571: latest amendment (Class 3 compounds) and the Tenderer shall provide full details of the composition and properties of the material in the relevant annexure where applicable.

Samples of waterbars shall be submitted for approval and all material subsequently supplied shall be identical in size, shape, colour and quality to the approved sample. The waterbar shall be of uniform cross-section and size and shall have lugs welded at 1m centres on both edges of the waterbar to hold it securely in position during concreting operations.

It shall be possible for all sizes of waterbar to be turned through a 75mm radius without damage or permanent set to the waterbar.

Joints in waterbars shall be kept to a minimum by the use of the longest possible lengths.

Waterbars shall be held to the required shape, lines, etc, in suitable formwork: site joints shall be bonded as directed by the manufacturer in such a way as to form a continuous watertight seal free from pin holes at any point of the length or width of the strip.

Formwork shall be designed to accommodate the waterbars without subsequent bending and the waterbars shall be adequately supported and protected from damage and sunlight until finally encased in concrete.

Waterbars shall be tested in accordance with BS 2782 and ISO R527.

(iii) Waterproofing with surface sealants

a) General

A groove of dimensions specified shall be formed, where indicated, and sealed by an approved sealant. The sealant shall be non-toxic and shall be either a hand applied bitumen putty sealant or a polysulphide sealant. The type of sealant to be specified on the drawings and the product to be used shall be approved by the Engineer.

b) Bitumen Putty Sealant

All joints shall be clean, dry and free of laitance. The concrete shall be at least four weeks old. The joint surfaces shall then be primed by an ancillary product and the sealant applied as per the suppliers specification. Special precautionary measures shall be taken to acquire a neat finish by covering the face edges of the joint with masking tape before priming. Any excess material will be cut away and finished flush.

c) Polysulphide Sealant

All joints shall be clean, dry and free of laitance. Prime joint face if required – following the suppliers specification. Apply the sealant and finish off flush with the concrete surface.

PSG5.5.12 Concrete in Wet Ground

Add the following:

“The permanent under drainage measures consisting of no fines concrete blankets connecting to a system of drains and which has been detailed for construction below structural floors and wall foundations are required to ensure the long term stability of the structures and to intercept any leakage water in order that prolonged undetected leakage from the structures is prevented from entering the dolomite sub-strata.”

PSG5.5.13 Grouting

Delete the contents of Clause 5.5.13 and replace with:

“5.5.13.1 Materials.

Water: Water for grout shall comply with the requirements given in SANS 200 G sub-clause 3.3.

- a) Aggregates: Notwithstanding the requirements of Sub-Clause 3.4.1 of SANS 1200G, the grading of fine (sand) and coarse aggregates shall conform to the grading given in Table PSG2.
- b) Cement: Cement shall be ordinary Portland cement complying with SANS 471.

- c) Admixtures: Admixtures shall comply with the requirements of sub-clause 3.5 of SANS 1200 G and shall have a proven record of satisfactory performance under conditions encountered in the Republic of South Africa.
- d) Proprietary grouting materials: Unless otherwise approved by the Engineer, proprietary grouting material shall be obtained ready mixed in sealed pockets as supplied by the manufacturers.

TABLE PSG2: GRADING OF AGGREGATE FOR GROUTS

FINE AGGREGATE (SAND)		COARSE AGGREGATE	
Sieve Size (mm)	% Passing by mass	Sieve Size (mm)	% Passing by mass
9,5	100	9,5	100
4,75	95 – 100	4,75	95 – 100
1,18	45 – 65	2,36	0 – 5
0,3	5 – 15		
0.15	0 – 5		

5.5.13.2 Preparation and Procedures.

- a) Before a machine or structural bedplate is placed on the concrete the following steps shall be carried out:
- b)
 - i) All defective concrete, laitance, dirt, oil, grease, and loose material shall be removed from the concrete foundation by bush-hammering, chipping, or other means until sound clean concrete is obtained. The surface of the foundation shall be scabbled, but shall not be so rough as to interfere with proper placing of the grout. All foundation bolt sleeves shall be cut out, or cut off flush if the sleeves cannot be removed. The top of the foundation shall be re-shaped if necessary.
 - ii) The underside of each steel base, particularly in the bearing areas, shall be cleaned and any burrs and ragged edges removed before the base is placed in its final location.
 - iii) All holding-down bolt sleeves shall be thoroughly cleaned of any materials that may prevent the grout from flowing freely to the bottom of the bolt sockets.
- c) The base shall be properly aligned and levelled and shall be maintained in that position during grouting.
- d) After the machine or structural bedplate has been placed the following precautions shall be observed:
 - i) Shimming shall be kept to a minimum. Steel plates shall be used for packing and shall be ground to the required thickness, where necessary.
 - ii) Before grouting is started all loose dirt, oil, grease, and other foreign matter on the surface of the foundation, the undersides of bedplates, and in the bolt holes shall be removed by means of compressed air or other approved means. The surface of the foundation slab shall be thoroughly saturated with clean water, and all free water shall be removed from the surface and the boltholes just before the grout is placed.
 - iii) Grouting shall not be carried out until the alignment of all units to be grouted has been checked and approved by the Engineer.

- iv) Special care shall be taken with grouting in hot or cold weather to ensure proper setting and gain of strength and, in the case of proprietary grouting materials, by having ice or hot water available,
- v) as the case may be, in accordance with the instructions of the manufacturer.
- vi) Enclosures shall be provided for the grout such that, until it has set its temperature will be in the range 15- 27°C.
- vii) Shields to protect the grout from the sun and from hot winds shall be provided by the Contractor when so ordered.

5.5.13.3 Formwork.

Formwork for grouting shall comply with the applicable requirements of Sub-Clause 5.2 of SANS 1200 G. Forms shall be caulked where necessary. Adequate clearance between forms and bedplates shall be provided to enable the grout to be worked into place.

5.5.13.4 Mixing (all free-flowing grouts except epoxy grouts).

The grout shall be mixed to a homogenous uniform mixture and delivered ready for placing at a temperature between 15°C and 25°C.

The materials and water shall be mixed in a mortar mixer for at least 3 min or, in the case of small jobs only, shall be thoroughly mixed by hand, the entire mass being turned over enough times to ensure even distribution of its components.

The mixing shall be done as close as possible to the place(s) where the grout is placed. No more grout shall be mixed at any one time than can be placed in a period of 20 min. After the grout has been mixed it shall not be re-tempered by the addition of water.

5.5.13.5 Grouting (all free-flowing grouts except epoxy grouts).

The grout shall be placed quickly and continuously to avoid the undesirable effects of over-working. (These effects are segregation, bleeding, and breaking-down of initial set.) The method of placement shall be subject to approval. The means of placing the grout shall be such that the grout will completely fill the space to be grouted, will be thoroughly compacted, will be free of air pockets, and will have evenly distributed contact over an area in excess of 80% or, in the case of expanding grout, 95% of the bearing area of the item to be supported.

Wherever practicable, grout shall be placed from one side only and where this is not practicable, care shall be taken to ensure that any entrapped air is released.

After the grout has taken its initial set,

- a) The forms shall be removed;
- b) Excess grout shall be so cut away as to leave a smooth and neatly finished job;
- c) Except where the grout is intended to provide resistance to side thrust, all edges shall be trimmed at 45° to the vertical, from the bottom edge of the bedplate; and
- d) All excess grout on or about the bedplates shall be removed.

Damage to paintwork, if any, shall be repaired within 24 hours.

Packing plates, shims, and other levelling devices shall remain in position.

5.5.13.6 Dry-Packed Grout (standard dry sand and cement, grout).

Dry-packed grout shall have a minimum compressive strength at 28d of 20 MPa. The quantity of water added after placing shall be kept to a minimum consistent with placing conditions, and the cement, sand and, where applicable, pea gravel proportions by mass shall be as follows:

- a) Where the clearance exceeds 25mm: 1 part of Portland cement, 1 part of sand, and 1 part of pea gravel.
Dry-packed grout shall be rammed by means of tamping rods against formwork placed along three sides of the bedplate.

5.5.13.7 Non-Shrink Grout with Metallic Aggregate.

The manufacturer's instructions shall be observed when non-shrink grout with metallic aggregate is used.

Where the clearance between the bedplate and the foundation is less than 50mm, a sand-based mix shall be used.

Where the clearance exceeds 50mm the engineer may order a mix with a base of sand plus pea gravel to be used.

5.5.13.8 Expanding Grout with Powdered Aluminium Additive.

The manufacturer's instructions shall be observed when an expanding grout with powdered aluminium additive is used.

Where the clearance between the bedplate and the foundation is less than 25mm, a sand-based mix shall be used.

Where the clearance exceeds 25mm the Engineer may order a mix with a base of sand plus pea gravel to be used.

Each batch shall be mixed for at least 6 min after the powdered aluminium has been added. Where a ready-mixed grout is used, the powdered aluminium shall be added at the placing site and the batch mixed as specified in PSG 3.2.15.4. Grout shall be placed within 45 min after the addition of the powdered aluminium.

The Contractor shall not use powdered aluminium additive when the ambient temperature is below 5°C.

5.5.13.9 Epoxy Grout (epoxy mortar type only).

The manufacturer's instructions shall be observed when an epoxy grout is used.

5.5.13.10 Testing.

The Contractor shall, where so ordered, carry out a site test for each grouting procedure and each grouting gang to be used. The tests shall be carried out on a dummy bedplate similar in configuration to that which is to be grouted, but not exceeding 1 m² in area unless otherwise ordered. When the dummy bedplate is dismantled, the underside shall show a minimum grout contact area of 80% with reasonably even distribution of the grout over the surface grouted except that, in the case of expanding grout, the minimum grout contact area shall be 95%. The test shall show evidence of good workmanship and materials and the results shall be to the satisfaction of the Engineer.

The Contractor shall, when so ordered, make standard test cubes from various grout mixtures and subject them to compression tests to determine whether the specified strength has been achieved. Test procedures shall comply with the relevant requirements of Sub-Clause 7.2.1-7.2.3 of SANS 1200 G.

PSG5.5.16 Bonding Fresh Concrete to Old Concrete (New Clause 5.5.16)

Insert the following new Clause:

"5.5.16 Bonding Fresh Concrete to Old

The following methods shall be used:

- a) Existing concrete less than 4 hours old:

- i) Horizontal joints: Place original concrete 25mm higher than level of joint and strike off surplus concrete as in Clause PSG 3.3.6. Place fresh concrete.
 - ii) Vertical joints: Remove shutter 1 hour to 2 hours after fresh concrete is placed. Carefully roughen surface with wire brush or compressed air to expose coarse aggregate and remove loose material. Place fresh concrete.
- b) Existing concrete between 4 hours and 3 days old:
 - i) Horizontal joints: After removing 25mm of surplus concrete as described in Clause PSG 3.3.6 brush the old concrete thoroughly with a wire brush to expose the coarse aggregate.

Alternatively use sand blasting. Wash joint with clean water to remove all laitance, dirt and loose particles.
Just before placing fresh concrete apply a thin layer of plastic mortar to the surface of the existing concrete. The mortar shall consist of cement and sand mixed in the proportion contained in the concrete mix i.e. omitting coarse aggregate. The mortar shall still be plastic when the fresh concrete is placed against it.
 - ii) Vertical joints : Roughen surface with wire brush to expose coarse aggregate and remove loose material. Alternatively use sand blasting, then treat as for horizontal joint in (b) (i) above.
- c) Existing concrete more than 3 days old:
 - i) Horizontal joints: As for (b) (i) above and that the construction joint surface shall be kept continuously damp for 24 hours before the plastic mortar and fresh concrete are placed, but no free water shall be visible on the surface prior to placing the mortar.
 - ii) Vertical joints: As for (b) (ii) above and that the construction joint surface shall be kept continuously damp for 24 hours before the plastic mortar and fresh concrete are placed.
- d) Adhesives:

Proprietary adhesives may be used for bonding concrete at easily accessible construction joints (e.g. slabs and beams) subject to the approval of the Engineer.
The manufacturer's instructions shall be followed by the Contractor. In general the existing concrete shall be prepared as described in Clause (b) (i) above.

PSG5.5.17 Expansion and Contraction Joints (New Clause 5.5.17)

Insert the following new Clause:

"5.5.17 Expansion and Contraction Joints.

- a) Location
 - i) Expansion and Contraction joints shall be located as shown on the drawings.
 - ii) Where smooth shutter finishes are specified the edges of the shutter boards or panels shall coincide with the joints
 - iii) All joints shall be truly vertical or horizontal unless otherwise specified.
- b) Forming Joints

All expansion and Contraction joints shall have a shuttered face. The shuttering shall be fixed firmly in position; it shall be split as required to accommodate water stops without loss of mortar at the joint.
To obtain a joint free from projections the shutters for the new concrete shall be tightly fixed to the existing concrete. Where possible the shutters shall overlap the joint and not be disturbed until the new concrete has hardened.

Joint recesses are to be formed to the dimensions and shapes indicated on the drawings by means of untreated clean timber with rough sides and so shuttered that the shuttering is rigidly fixed during placing of concrete and can be removed without any timber having to be left in the recesses.

Shuttering shall be left in the joints until these are ready for sealing, whereupon the shuttering shall be removed and the surfaces of the recesses shall be thoroughly cleaned by light hammering with a chipping hammer and wire brushing to remove all laitance and thoroughly cleaned and dried by using compressed air passed through suitable oil and moisture traps, and by heating with a blow-lamp. Care shall be taken not to overheat the concrete.

c) Construction

- i) Each section of pre-moulded water stop shall be of the maximum practicable length so that the number of end joints will be a minimum. Continuous seals are to be obtained in the field by jointing the water stops by heat fusion using suitable jigs and heating tools. Joints shall develop effective water tightness equal to that of the continuous material and shall permanently develop the full mechanical strength of the parent section and retain its flexibility. Water stops shall be securely and accurately located in position in the shutters before concreting commences. Nails, wires or other fastenings shall be used only in anchoring ribs.
- ii) Concrete around water stops shall be properly placed and compacted to avoid honeycombing. To ensure full contact between the water stop and the concrete around its periphery, concrete in the vicinity of the seal is to be well vibrated and the seal worked up and down by hand to expel entrained air, when the concrete has reached the level of the seal.
- iii) Joint filler (expansion joints only) to the sizes and thicknesses shown on the drawings shall be fixed to the joint face before the ensuing concrete is cast.
- iv) All recesses to receive joint sealer shall first be cleaned as described in (b) of this clause. Thereafter a primer matched to the sealer, shall be applied by brushing it well into the sides of the joint to ensure complete coverage. Where shown on the details or in accordance with the jointing material manufacturer's standard procedures an approved bond breaker shall be inserted into the recess. Sealants shall be tooled into position for complete air-free filling of voids. The surface of the joint shall be smoothed with a clean spatula. To obtain neat straight line joints the adjacent concrete shall be suitably masked.
- v) The preparation and priming of joint surfaces, the mixing of the components of the sealer, the application and tooling shall all be carried out strictly in accordance with the manufacturer's instructions. Priming of joints shall not be commenced before the concrete has set for at least 21 days.
- vi) Sliding joints shall be formed where shown on the drawings. The upper concrete surfaces forming the sliding surface are to be steel trowelled to a smooth and level surface. Only when thoroughly set and dry and prior to the upper layer of concrete being cast thereon, shall these surfaces receive two coats of an approved bituminous paint.

PSG5.5.18 Sterilization of Reservoirs (New Clause 5.5.18)

Insert the following new Clause:

Before a reservoir is sterilised, the roof shall have been tested for water tightness as set out in Clause 5.5.11.3 above, and the pipelines serving the reservoir shall have been sterilised. The reservoir shall then be thoroughly cleaned out and washed down with clean water.

The roof and walls shall thereafter be thoroughly sprayed down, using pressurised equipment, and the floors shall be scrubbed with water containing 0,015 g per litre of chloride of lime.

On completion of the sterilisation, the sterilising solution shall be run to waste before the reservoir is filled for testing its water tightness.

Should additional work be required to be done inside the reservoir after the water tightness test has been completed, the reservoir shall be re-sterilised at the Contractor's expense.

PSG5.6 Pedestals/Foundations and HD bolts for equipment (New clause 5.6)

Insert the following new Clause.

"5.6 Pedestals/foundations and HD bolts for equipment.

The mechanical supply contractor will supply all holding down bolts for all items of plant supplied by themselves, and which are to be fixed in position under this Contract.

The supplier of the plant and equipment will provide all dimensions and other details necessary for the construction of bases, pedestals, HD bolt pockets or the fixing of the bolts. The Contractor shall either form pockets or cast in the bolts as ordered. The items of plant not supplied under this Contract will be aligned and levelled on site by the mechanical supply contractor by means of metal blocks and shims and after the Engineer is satisfied with the alignment and the level of each unit, the Contractor shall grout up the units solidly by filling the voids inside and under the base plate with an approved non-shrink grout.

No screeding of clarifier floors shall be allowed unless with the written approval of the Engineer in which case the Contractor shall consult with the Mechanical Contractor for advice on the proper application method"

All holding down bolts and nuts, other than those used in structures retaining liquid shall be galvanised in accordance with SABS 763.

All holding down bolts and nuts in structures retaining liquid shall be Stainless Steel, Grade 316.

Exposed threads of holdings down bolts shall be adequately protected with grease and sacking and this protection shall be maintained in all portions of the works until they are taken over.

PSG5.7 Pipe work (New clause 5.6)

Insert the following new Clause.

All pipe specials shall be cast in by the Contractor. Special care shall be taken to maintain them in the exact position shown on the drawings and also to render the joints watertight.

For pipework to be cast in at a later stage, square box-outs shall be provided. For pipes with puddle flanges to be cast in, the size of the box-out shall be suitable for the outside diameter of the pipe plus a full size (class 10) flange according to SANS 1123 plus 100mm. For pipes without puddle flanges, the size of the box-out shall be suitable for the outside diameter of the pipe plus 100mm.

Pipework cast into concrete structures shall be done so with a suitable standard non-shrink grout (BASF Masterflow 525, Sika SikaGrout 212 or similar).

PSG7 TESTS

PSG7.1 Facilities and Frequency of sampling

PSG7.1.1 Facilities

Add the following:

The Contractor shall provide sufficient watertight tanks approximately 400mm deep for the storage of cubes in compliance with SANS Method 863 prior to testing.

The cost of all testing, including the cost of sampling, storage and transport of samples shall be included in the rates tendered for concrete work."

PSG7.3 Acceptance criteria for strength concrete

Add the following:

"Test results obtained from the supplier of ready-mixed concrete will not be accepted for evaluation in terms of sub-clause 7.3, but samples for testing shall be taken of such concrete at the point of placing."

PSG8 MEASUREMENT AND PAYMENT

PSG8.1 Measurement and Rates

PSG8.1.1.2 Delete "or splays over 20 mm x 20 mm" from the first line of paragraph 8.1.1.2.

Add the following to paragraph 8.1.1.2:

"Splays up to and including 25 mm x 25 mm will not be measured separately and will be deemed to be included in the formwork costs."

Add the following new paragraphs:

PSG8.1.1.7 For construction joints at kickers, all additional costs for formwork to edges up to 300 mm high will be deemed to be included in the rates tendered for vertical formwork to sides of walls and will not be measured separately in narrow widths.

PSG8.1.1.8 No formwork will be measured to edges of blinding layers under structures, and the cost thereof (if needed) will be deemed to be included in the rates tendered for concrete in blinding layers.

PSG8.1.1.9 Back-shuttering or formwork to top revealed surfaces of sloping or conical formwork will only be measured to surfaces of over 40° and up to 85° to the horizontal.

PSG8.1.1.10 Formwork to horizontal surfaces in pump stations, valve chambers, manholes or sumps can either be removed through the manhole cover opening or the Contractor may use permanent formwork at his own cost as no claims in this regard will be considered."

PSG8.1.2 Reinforcement

Delete sub-clause 8.1.2.2 and replace with the following:

"The masses of all round steel bars are scheduled provisionally in the Schedule of Quantities for all diameters."

Delete "of nominal size 25 mm" from sub-clause 8.1.2.3(a).

PSG8.2 Scheduled Formwork Items

PSG8.2.2 Smooth

Add the following to the description of the payment item:

"The rate include full compensation for producing a smooth finish as specified in SANS 1200 G sub-clause 5.2.1(b) as amended in PSG3.2.1, inclusive of rubbing."

PSG8.4 Scheduled Concrete Items

PSG8.4.4 Unformed Surface Finishes

Delete sub-item (d) and insert the following:

(b) Steel-floated finishes

Add the following sub-item:

"(i) Extra over sub-item (b) for special finishing tolerances to top of outside ringwalls as specified Unit: m²

The quoted rate shall include full compensation for the additional cost of finishing the ringwalls to closer tolerances as specified on the Drawings and in clause PSG 7.1."

"d) Surface hardener or similar treatmentUnit: m²

The rate shall include full compensation for the procurement, transport, access to the surfaces to be coated, surface preparation, application of a primer consisting of an approved epoxy modified cementitious thixotropic mortar (Sikagard – 720 EpoCem ZA or equivalent) followed by a minimum of 2 coats of a two component solvent free, high build thixotropic epoxy resin coating (Sikagard – 63N or equivalent) which is eminently suitable for the protection of areas particularly prone to chemical attack and which will provide a hard glossy surface finish with a dry film thickness of not less than 300 microns.

The preparation of surfaces and the coating shall be strictly in accordance with the manufacture's printed instructions.

PSG8.4.7 No-Fines Concrete (new payment item 8.4.7)

Add the following new payment item:

"8.4.7 No-fines ConcreteUnit: m³

The rate shall include full compensation for all costs relating to the design, production and placing of no-fines concrete as specified in PSG5.5.1.8."

PSG8.7 Grouting

Delete the contents of the payment item and replace with the following:

"a) Under bases and beds, using:

i) Cementitious free flowing grout UUnit: m³

ii) Dry-packed groutUnit: m³

b) HD bolts, etc using and approved epoxy groutUnit: m³

c) Voids in walls and floors of thickness less than or equal to 350 mm in water retaining structures, using an approved non-shrink cementitious grout, for an area of:

i) less than or equal to 0.25 m² Unit: No

ii) greater than 0.25 m² but less than or equal to 1.0 m² Unit: No

d) Voids in walls and floors of thickness greater than 350 mm, but less than or equal to 500 mm in water retaining structures, using an approved non-shrink cementitious grout, for an area of:

i) less than or equal to 0.25 m² Unit: No

ii) greater than 0.25 m² but less than or equal to 1.0 m² Unit: No

e) Voids in concrete walls and slabs for pipe work ducts, specials, penstocks, etc, supplied and placed by others, using an approved non-shrink cementitious groutUnit: m³

PSG8.9 Testing for water tightness (New payment item 8.9)

Add the following new payment item:

8.9 Testing for Water Tightness Unit: No

The rate shall include full compensation for undertaking tests for water tightness as specified in sub-clause 5.5.11.3 of PSG5.5.11, including all plant, labour, materials and other incidentals.

PSG8.10 Building pipes into concrete work (New payment item 8.10)

"8.10 The rate shall include full compensation for breaking through, installing and grouting pipes into concrete work complete. Unit: No

PSG8.11 Join New Concrete to Existing (New payment item 8.11)

"8.11 Demolish, expose, clean, drill, supply and install steel dowels and apply epoxy bonding compound to join new concrete to existing concrete Unit: No

PSG8.12 Miscellaneous work other than metalwork..... Unit: as scheduled

Separate items will be scheduled for each type of miscellaneous work.

The tendered rates shall include full compensation for providing all labour, materials and equipment required to carry out the work, for all preparatory work, for constructing the work scheduled in a workmanlike manner and for finishing off and cleaning up when the work has been completed

PSG8.13 Screeds

- (a) Floor screeds (1:3) with falls including V-joints to form panels and a smooth steel-trowelled fish/power float finish to top:
 - (i) Description of application and thickness.....Unit: m²
 - (ii) Etc for other applications and thickness

The unit of measurement shall be the square meter of screed constructed.

The tendered rate shall include full compensation for constructing the screeds as specified including supplying of all materials, preparing the concrete surface to receive the screeds and for all else that may be necessary to complete the work

PSG8.14 Casting in pipes with or without puddle flanges

- (a) Up to 300 mm nominal bore:
 - (i) Through (description and thickness of structural elements)..... Unit: No
- (b) Over 300 mm up to 600 mm nominal bore:
 - (i) Through (description and thickness of structural elements)..... Unit: No
- (c) Etc for other nominal bores in increments of 300 mm

The unit of measurement shall be the number of each size of pipe installed.

The tendered rates shall include full compensation for installing the pipe where new pipes are used (with or without a puddle flange) in the exact position as shown on the Drawings, for splitting or cutting the formwork where required, supply and installation of suitable non-shrink grout and for ensuring watertightness where required and for all additional costs required to install the pipes specified or shown on the Drawings.
Pipe items to be cast in shall be measured elsewhere.

PSG8.15 Corrosion protection by

- (a) Vinyl anti-fouling paint and undercoats to form an algae-resistant coating on:
 - (i) (Description of structural element stated)..... Unit: m²
- (b) Solvent-free abrasion-resistant coating and primer to a minimum thickness of 3 mm on:
 - (i) (Description of structural element stated)..... Unit: m²

The unit of measurement shall be the square meter of surface protected against corrosion.

The tendered rates shall include full compensation for surface preparation for supplying and applying the materials as specified, for all labour, equipment and appurtenant materials necessary to carry out the work and for all waste and cleaning up after the work has been completed.”

PSG8.16 Emergency site reinforcement and equipment.....Unit: ton

The Contractor must bring onto site the following site reinforcement that is to be used for emergency situations at the sole discretion of the Engineer:

10 straight lengths of 10 m of Y10 reinforcement, plus
10 straight lengths of 10 m of Y12 reinforcement, plus
10 straight lengths of 10 m of Y16 reinforcement, plus
10 straight lengths of 10 m of Y20 reinforcement

In addition to the above, the Contractor must keep on site manual tools for cutting and bending the above reinforcement in emergency situations as per Engineers' instructions.

All the above reinforcement and equipment must be kept dry, clean and available for use at very short notice. Any of the above reinforcement that is used, must be replaced as soon as practically possible.

Payment will be as follows:

1. 80 % of the tendered amount will be paid when the above material and equipment is brought to site and stored in a manner that is acceptable to the Engineer.
2. Reinforcement used will be paid for under the "normal" reinforcement items.
3. The remaining 20 % of the tendered amount will be paid when all material and equipment is removed from site, after being instructed to do so by the Engineer.

PSHA: STRUCTURAL STEELWORK (SUNDRY ITEMS)

PSHA3 MATERIALS

PSHA3.1 Structural Steel

Replace the first sentence with

“a) Mild steel shall be Grade 300W complying with SANS 1432

PSHA3.2 Welding Consumables

PSHA3.2.1 Electrodes

Replace the contents of Sub-Clause 3.2.1 with

“Electrodes for mild steel shall comply with the applicable requirements of SANS 455.

PSHA3.3 BOLTS, NUTS AND WASHERS (3.3)

PSHA3.3.1 Bolts and nuts (other than Friction-grip)

Amend sub-clause 3.3.1 as follows:

“Bolts and nuts other than fitted bolts and other than bolts and nuts for friction-grip joints shall comply with the requirements of SANS 135, SANS 136 or SANS 1143 (as applicable) for the type shown on the drawings or scheduled. Nuts shall be of at least the strength grade appropriate to the grade of bolt or other threaded element with which they are used. Fitted bolts shall comply with the relevant requirements of SANS 136. Washers for bolts and nuts shall comply with the relevant requirements of SANS 1149.”

PSHA5 CONSTRUCTION

PSHA5.1.2 Shop Details

Replace the first sentence of this clause with:

“The Engineer’s drawings issued for construction purposes are preliminary with regards to structural steel items and the Contractor shall prepare shop drawings of all structural steel items for the Engineers approval.”

Add the following sentence to the end of this clause:

“No payment shall be considered for any structural steel item without shop details being provided and approved by the Engineer in writing.”

PSHA5.2 Fabrication and Assembly

PSHA5.2.6 Handrails

Substitute the first sentence with the following:

“Handrails shall be of the tube and sphere type similar to Monoweld and shall be manufactured from an approved specialist using grade 304 L stainless steel or hot dipped galvanized steel (heavy duty coating) all as detailed on drawings. Handrails shall be 1000mm high consisting of a hand rail and knee-rail. Rail steel tubing shall be minimum 34mm diameter and 2.6mm thick. Stanchions shall be formed as one unit out of minimum 42mm diameter tubing 2.6mm thick steel. Base plates are to be minimum 150mm x 75mm x12.5mm thick flat bars manufactured to suit top, side or slope mounting. Stanchions are to be spaced maximum 1.5m fixed with M16 bolts and all joints welded.”

PSHA5.2.8.1 Prefabricated Open Grid Floors

Add the following:

Open grid flooring shall be of square pattern with 40 x 4mm minimum thickness bearer bars spaced at no more than 40mm centres out of grade 304 L stainless steel or 3CR12 steel.

Frames shall be as scheduled out of 50 x 50 x 5mm thick 3CR12 steel angle. Nett clearance between side bars of the open steel flooring and the vertical leg of the frame or strip shall be 5mm per side. The frames shall be complete with 100 x 40 x 3mm 3CR12 steel anchors fixed at 500mm centres for building the frame into concrete.

Pickling and passivation shall be carried out in accordance with the Standards Corrosion and Painting Specification for Civil Engineering Works.

PSHA5.2.10 Protective Treatment

This clause shall be replaced with the requirements of Particular Specification PTV (Corrosion Protection).

ADD THE FOLLOWING

PSHA5.2.11 Weir Plates

Weir Plates are to be made out of 6mm thick 3CR12 steel with M10 stainless steel bolts. The weir plates are to be fixed to concrete using 8mm thick neoprene seals.

PSHA5.2.12 Penstocks

All parts shall be designed for the duty required with a minimum factor of safety of 3 of the working stress of the material. Due consideration for anti-corrosion shall be given in determining the thickness and 100 Newtons shall be the minimum force at each handwheel to raise a gate or open a penstock.

Frames will be out of grade 304 stainless steel with minimum thickness of 3.5mm.

Anti-jamming mechanisms shall be incorporated in all gates assembly and wall mounted gates shall be held uniformly against the side facings of frames by adjustable wedges to provide drop tight closure.

Penstocks shall only allow water passage through the designed opening and shall be of the level invert type with renewable non-biodegradable seals at invert. Penstocks shall have rising spindles in transparent nylon sleeves. Handwheels shall be cast iron operation directly on head frame or on a grade 304 stainless steel tubular pedestal. Bolts made out of class 304 stainless steel shall be used for fixing penstocks to walls where required. The Contractor shall be responsible for grouting and adjustments of Penstocks for their smooth operation.

PSHA5.2.13 Hand stops

All parts shall be designed for the duty required with a minimum factor of safety of 3 of the working stress of the material. Due consideration for anti-corrosion shall be given in determining the thickness and 2000 Newtons shall be the maximum force required to raise a gate or open a hand stop. Where the force required exceeds the 200 Newtons, then the hand stop shall be cut in more than on section, each to handle the maximum 200 Newtons.

Frames and gates will be out of aluminium with minimum thickness of 3.5mm.

All gates shall be guided in frames to provide drop tight closure under all conditions. Hand stops shall only allow water passage through the designed opening and frames shall extend to the top of the concrete members concerned. Water leakage through hand stops shall be limited to maximum of 1litre/15 minutes. The Contractor shall be responsible supplying and installing hand stops including grouting and adjustments of hand stops for their smooth operation

PSHA8 MEASUREMENT AND PAYMENT

PSHA8.3 Scheduled Items (8.3)

Add the following to clause 8.3.1

- PSHA8.3.1 (a) Palisade fence (2.1m High).....Unit m
- b) 6m wide double palisade gate with posts and padlock complete as per drawing.....Unit No
- c) 1m wide single palisade gate with posts and padlock complete as per drawing.....Unit No

The rate shall include full compensation for procuring and furnishing all material, including treating, painting, hinges and bolts, welding, delivering to site, padlocks and for installing the gates and fencing complete as specified on the drawings.

PSHA8.3.2 Handrails

PSHA8.3.2(b) **Handrail assembly complete** **unit: m**

Delete the reference to "details given" and add as specified in clause PSHA5.2.6 (state material to be used)

Rate to include hand and knee rail installation complete

PSHA 8.3.3 Ladders, complete and installed (Drawing number or type and length stated)

Replace this item with the following:

"PSHA 8.3.3 Ladders, complete and installed (Drawing number or type and length stated)

Separate items will be scheduled for grid ladders of different materials, dimensions and height.....Unit: No

The tendered rates shall include full compensation for the cost of supplying the specified or scheduled ladders complete, including welding where applicable."

PSHA 8.3.4 Flooring, Complete and installed with frames (Drawing number stated)

Replace this item with the following:

"PSHA 8.3.4 Flooring, Complete and installed with frames:

- (a) Open grid floors..... Unit: m²
- (b) Floor plate floors..... Unit: m² or t
- (c) Frames and kerbs for flooring..... Unit: m

Separate items will be scheduled for grid floors, floor-plate floors, frames and kerbs of different materials, dimensions, weight and different methods of fixing.

The tendered rates shall include full compensation for the cost of supplying the specified or scheduled types of flooring, frames or kerbing complete, including welding where applicable."

PSHA8.3.6 **Corrosion Protection**

Substitute with the following:

The corrosion protection of sundry steel items shall not be measured separately. The cost shall be included in the rate for the related item.

PSHA8.3.7 Miscellaneous items (New Sub-Clause 8.3.7)

Add the following item:

- a) Access covers including frames and bolts, complete as per drawing Unit: No

- b) Access ladders, landings and bolts complete as per drawings.(different types scheduled separately Unit: No
- c) Supply and install complete with full bore outlets, drainage pipes as detailed on the drawings Unit: No
- d) Supply and install roof ventilators complete as detailed on the drawings Unit: No
- e) Supply and install 3CR12 weir plates (state size), and refer to drawings..... Unit: No
- f) Supply and install Grade 304L stainless steel penstock (state size of clear opening, height to handwheel, channel or wall mounted),and refer to drawings Unit: No
- g) Supply and install Aluminium hand stops (state size of clear opening) and refer to drawings..... Unit: No

The unit rate shall cover the cost of fabrication and supply complete with all the necessary cleats, brackets, gussets, fasteners, packs and the like, surface preparation and surface treatment delivery to site of all material, erection on site including erection bolts casting in as applicable, all as per drawing or manufacturers specifications.”

PSHB: CLADDING AND SHEETING

PSHB3 MATERIALS

PSHB3.1 Thickness of Sheeting

Delete Table 1 and replace with the following:

“All sheeting to be either galvanized steel or aluminium steel with the minimum thicknesses shown below.

TABLE 1: MINIMUM THICKNESS OF SHEETING

APPLICATION	MINIMUM THICKNESS (mm)
Roof Sheeting (1) GMS (2) Aluminium	0,6 0,7
Side Sheeting (1) GMS (2) Aluminium	0,6 0.7
Closure Pieces (1) GMS (2) Aluminium	0,6 0.7
Ventilators	0,8
All Other Items Including ridging's, flashings etc., as for sheeting	

PSHB3.2 Steel Sheeting

PSHB3.2.1 Galvanized Steel Sheeting

Delete the sub-clause and replace with the following:

“Galvanized steel sheeting shall be of IBR profile, with a minimum thickness of 0,6mm and shall comply with the requirements of an approved manufacturer's specification. The galvanizing shall comply with the relevant requirements of SANS 150 9364 for Class Z600 coating and shall have been passivated.”

PSHB 3.2.2 Pre-painted Galvanized Steel Sheeting

Delete the sub-clause and replace with the following:

“Pre-painted galvanized steel sheeting shall be “Chromadek” of IBR profile, with a minimum thickness of 0.6 mm and shall comply with the requirements of an approved manufactures specification”.

PSHB5 CONSTRUCTION

PSHB5.1 Responsibility

PSHB5.1.4 Installation Details

Add the following to Sub-Clause 5.1.4

“All sheeting shall be fixed in strict accordance with the approved manufacturer's recommendations.

The side lap shall be not less than two corrugations and the end lap shall not be less than 250mm.”

PSHB5.5 Installation of Sheeting

PSHB5.5.5 Fixing of IBR Sheeting (new sub-clause 5.5.5)

Add the following new sub-clause:

“5.5.5 Fixing of IBR Sheeting. Main structural fasteners shall be fixed at 343mm centres through the narrow flute crowns of each side lap and the centre flute. Side laps shall be fastened at not more than 914mm centres. The manufacturer’s recommendations shall be followed regarding the type of fasteners to be used. All flashings shall be fixed with either the main fasteners or other fasteners recommended by the manufacturers.”

PSHB7 TESTING

PSHB7.1 General

PSHB 7.1 .1 Application

Add the following to the sub-clause:

“For the purpose of these tests, the loads to be applied are the loads specified in Code of Practice SANS 0160 – The General Procedures and Loadings to be adopted for the Design of Buildings

PSL MEDIUM PRESSURE PIPELINES

PSL3 MATERIALS

PSL3.4 Steel Pipes, Fittings and Specials

PSL3.4.3 Pipes, Fittings and Specials of Nominal Bore over 150 mm

Delete the contents of the sub-clause and replace with the following:

“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.

“All mild steel pipes and fittings, other than screwed and socketed pipes, of diameter greater than 150mm shall be electrical resistance welded complying with SANS 719 grade A and shall have walls of thickness not less than 6mm for pipe diameters up to 300mm and 8mm for pipe diameters above 300mm.

All mild steel pipes and fittings of diameter 150mm and less shall comply with SANS 62. Before delivery to the site all mild steel pipes, fittings and specials shall be protected against corrosion in accordance with the relevant specification.

Plain ends of pipes and fittings shall be covered and protected against damage while being transported to the site.

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.”

PSL3.4.4 Fittings and Specials

Delete the sub-clause and replace with the following:

“3.4.4 3CR12 Pipes, Fittings and Specials. Where 3CR12 steel is specified it shall be manufactured by an approved manufacturer. Test certificates and marking shall be as for stainless steel.

3CR12 steel shall be supplied passivated and upon completion of fabrication welds and other areas where the passivation has been removed or damaged and areas discoloured shall be cleaned and pickled using a Nitric and Hydrofluoric acid formulation. After cleaning and pickling all areas shall be thoroughly cleaned with clean water and re-passivated immediately thereafter with a proprietary passivating solution of 10% to 20% Nitric Acid in Aqueous solution as recommended by the material suppliers.

Welding of 3CR12 steel shall be carried out under controlled conditions using stainless steel 309L welding rods or as recommended by the material suppliers. All welds shall be continuous and crevice free. Welders undertaking manual and semi-automatic welding of 3CR12 steel shall be competent artisans meeting the requirements of BS 4871 or BS 4872 Part 1 as appropriate.

Cutting welding and passivating of 3CR12 steel shall be carried out in strict accordance the material suppliers procedures and guidelines.

Wall thicknesses and dimensions generally shall be as for mild steel piping.”

PSL3.4.5 Stainless Steel Pipework and Fittings (New sub-clause 3.4.5)

Add the following new sub-clause:

“3.4.5 Stainless Steel Pipe work and Fittings. Stainless steel pipes shall be Grade TP 304L or TP 316L as specified.

Welding and visual examination of stainless piping shall be carried out on accordance with BS 4871 Part 1 and BS 2633 as appropriate. Dye penetration examination shall be undertaken on not less than 10 % of all welds.”

PSL3.4.6 Bolts, Nuts and Fasteners (New sub-clause 3.4.6)

Add the following new sub-clause:

- “3.4.6 Bolts, Nuts and Fasteners. 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.”

PSL3.4.7 Couplings (New sub-clause 3.4.7)

Add the following new sub-clause:

- “3.4.7 Couplings. 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 1.1.5.
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.”

PSL3.4.8 Flanges, Drilling and Jointing Material (New sub-clause 3.4.8)

Add the following new sub-clause:

- “3.4.8 Flanges, Drilling and Jointing Material. The dimensions of standard flanges shall comply with the requirements of SANS 1123 unless otherwise specified. Drilling dimensions shall be to SANS 1123 for the working pressure as specified for each application. Interconnecting pipelines between structures: Table 1000/3. Pumping mains and pipelines: Table 1000/3. Interconnecting existing pipelines table to be confirmed on site. Pressure above 16 bar table 1600/3 to be used.
Where flanged valves and meters are required in pipelines, the drilling shall be to Table 1000/3 or other Table to suit the valve or meter supplied.
Flanges for low pressure applications of less than 1000kPa shall be the “slip on” type. Flanges for high pressure applications greater than 1000 kPa shall be “socket weld” type.
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.”

PSL3.7 Pipework for sub soil and underfloor drainage

Pipes for sub soil and under floor drainage shall have a nominal diameter as specified in the Bill of quantities. The pipe shall be manufactured from High density Polyethylene (HDPE) with a solid 5.0mm wall thickness. It shall be extruded into an open lattice wall structure with 70% of the diameter consisting of open area and a 30% solid area along the invert.

To minimise the risk of mineral and / or biochemical clogging of the pervious infiltration zone, the drainage voids in the open structure of the pipe shall have no dimension

consistently smaller than 3mm, and to minimise the risk of small aggregate entering the pipe, no dimension consistently larger than 12mm.

PSL3.8 Jointing Material

PSL3.8.4 Loose Flanges.

Substitute the first sentence of the last paragraph with the following:

Bolts and Nuts shall comply with SANS 135

PSL3.9 Corrosion Protection

PSL3.9.2 Steel Pipes

PSL3.9.2.1 Steel Pipes of nominal bore up to 150mm

Add the following:

The requirements of PSL3.9.2.2 shall apply

PSL3.9.2.2 Steel Pipes of nominal bore over 150mm

Add the following:

All mild steel pipework shall be treated in accordance with L3.9.2.2(b)(2) internally and externally, with a polyamide-cured epoxy system similar and equal to Copon EP2300 or Amercoat 385. The Contractor must furnish the Engineer with test certificates in accordance with PSL7.4

Substitute "250micron" in L3.9.2.2(b)(2) with "300micron"

PSL3.9.5 Joints, Bolts, Nuts and Washers

Substitute with the following:

All joint, bolts, nuts and washers shall be of grade 304 stainless steel, where installed above ground level or below water level. Hot dipped galvanised bolts, nuts and washers shall be used.

PSL3.10 Valves

Delete the contents of the sub-clause and replace with the following:

"Valves that are manually operated shall be to a pattern approved by the Engineer with non-rising spindles complying with the requirements of SANS 664 for working pressures as specified or shown on the Drawings for each application. Where no working pressure is stated, class 10 shall be selected Valve dimensions shall be to SANS 665. The direction of closing shall be clockwise when viewed from above and shall be clearly marked on the hand wheel of each valve. The valve trim shall be Type B-gun metal trim. Valves of the resilient seal type shall be used with dimensions as for standard valves and blade encapsulated in resilient hard rubber or similar synthetic material to the approval of the Engineer.

Valve bodies, hand wheels and bonnets shall be manufactured from spheroidal graphite iron complying with the requirements of BS 2789 Grade 420/12 be free from blow holes and carefully fettled after casting. Spindles shall be manufactured from bronze to BS 1400/2782 Grade PB1/CZ 114 or stainless steel to BS 970 Grade EN 57 or equal approved material. Spindle nuts shall be manufactured from bronze and be replaceable. Spindle seals shall be of nitrile rubber 'O-ring' type with bush insert and be provided with an external scraper ring. Replacement of the seals shall be possible with the valve under pressure.

Extension spindles shall be manufactured from stainless steel 304.

Headstocks shall be manufactured from stainless steel 304L or cast iron to a pattern approved by the Engineer."

PSL3.11 Manholes and Surface Boxes

PSL3.11.4 Step irons

Substitute with the following:

Step irons shall consist of polypropylene coated 12mm high tensile steel such as Calcamite or similar installed to manufacturer specifications

PSL3.12 Pipeline Markers

Add the following new sub-clause

Pipeline markers shall be installed at the following positions:

- Horizontal bends
- Servitude boundaries of provincial roads and railway lines
- Between horizontal bends and valve chambers where distances in between exceed 300m.

PSL4 PLANT

Add the following new sub-clauses:

PSL4.1.1 Transportation

Fittings, specials and valves shall be protected during transportation and handling against damage caused by impact, dropping, etc.

PSL4.1.2 Off-loading and storage

Pipes, fittings and specials shall at no time be laid, stacked or rolled directly onto the ground but shall be supported on suitable padded cradles or other approved material near each end of the pipe, fitting or special. Particular care shall be taken where pipes with fitted couplings are handled or stacked to prevent any pressure on the couplings.

PSL4.1.3 Inspection on delivery

The Contractor shall thoroughly inspect all pipes, fittings and specials delivered to the site.

Materials rejected by the Engineer shall be removed from the site within 30 days and shall be replaced by other approved materials by the Contractor at his own expense.

PSL4.3 Testing

Add the following:

The Contractor must ensure that all test equipment is fully calibrated and in good working condition.

PSL5 CONSTRUCTION

PSL5.11 Over coating Steel Pipes: System K (New sub-clause 5.11)

Add the following new sub-clause:

“5.11 OVERCOATING STEEL PIPES: SYSTEM K. Polyamide cured epoxy (Capon EP 2300) coated pipe work except for buried pipe work shall after erection be over coated with two coats of high gloss polyurethane enamel each with a minimum dry film thickness of 30 microns applied strictly in accordance with PSL 1.2 and the manufacturer’s instructions. The previously painted surfaces shall be abraded to a uniform matt surface and then thoroughly degreased using a degreasing agent approved by the paint manufacturer. After degreasing the surface shall be copiously rinsed with clean water and allowed to dry.”

PSL5.12 Paint Banding of Pipe work (New sub-clause 5.12)

Add the following new sub-clause:

“5.12 PAINT BANDING OF PIPEWORK. Process pipe work after erection and testing and which is exposed above ground or terrace level shall where ordered by the Engineer be colour coded by painting two coats of high gloss polyurethane enamel to form 75mm wide bands around the circumference of the pipe. Pipe work surface shall be prepared to receive the banding in accordance with the paint manufacturers written instructions. Masking tape shall be concentrically applied to ensure neat and straight demarcations between the colours.

PSL5.13 FLEXIBLE CONNECTIONS AT STRUCTURES

Add the following new sub-clause:

In order to avoid damage to rigid pipes entering structures or other chambers caused by differential movement, all pipes built, cast or grouted into structures or other chambers shall be provided with flexible connections to the type details shown on Drawing LD-2 of SABS 1200 LD.

PSL6 TOLERANCES

Delete Sub-clauses 6.1 and 6.

PSL6.3 Alignment Plan and Level

Delete Clause 6.3 and replace with:

“The permissible deviation in plan and level alignment from the designated line of the pipeline shall be $\pm 20\text{mm}$ and $\pm 10\text{mm}$ respectively provided always that the rate of departure from the designated line nowhere exceeds 1 in 600.”

PSL7 TESTING

PSL7.3 Standard Hydraulic Pipe Test

PSL7.3.1.2 Test Pressure

Substitute with the following;

Field test pressure shall be 1.5 times the rated maximum working pressure of the pipe e.g. class 6 uPVC shall be tested to 900kPa

PSL8 MEASUREMENT AND PAYMENT

PSL8.1 General

Delete Clause 8.1 and replace with:

Excavation and backfilling of trenches will be measured under SANS 1200DB. Corrosion protection and painting of steel and stainless steel pipe items shall not be measured separately. The price for corrosion protection and painting shall be deemed to be included in the price for the pipe, fitting or special.

PSL8.2 Scheduled items (8.2)

PSL8.2.16 Detailing and supply Steel Pipes and Specials (New payment item 8.2.16 (a) and 8.2.16 (b))

Add the following new payment item:

“

8.2.16 (a) Detailing, supply and delivery to site of steel pipes and specials complete with nuts, bolts and gaskets by nominated subcontractorUnit Provisional Sum.

Steel pipes and specials shall be shown, as regards size, wall thickness, position and elevation, on the approved for construction drawings together with coating and any other special requirements.

The actual price paid or due to be paid by the Contractor shall include for the cost of detailing and supplying pipe schedules for approval by the Engineer and the supply on site of the coated pipes and specials complete with jointing materials (gaskets, nuts, bolts washers etc.) It shall also include for quality management, inspection, handling, transporting and stacking on sandbags in a designated storage area on the site. Closure pieces (distance pieces) shall not be manufactured until their dimensions have been ascertained by measurement in the field.

“8.2.16 (b) In respect of overheads, other charges and profit on (a) above, a sum being a percentage rate of the actual price forthe pipes and pipe specials supplied Unit: %(percent)

PSL8.2.17 Uplift, Lay, Bed, Joint and Test Pipe work (New payment item 8.2.17)

Add the following new payment item:

“8.2.17 Uplift, Lay, Bed, Joint and Test Pipe workUnit: m
Pipe work supplied and delivered under Sub clause PSL 4.2.1 shall where laid in trenches or on bedding for subsequent covering by embankment, be measured and paid for under this item. The unit of measurement shall be the linear metre. The pipelines will be measured in metres over all lengths as laid, along the centre line including bends, T-pieces, laterals, other specials and valves. Separate items will be scheduled for each nominal diameter. The rate shall include for uplifting from storage, repairing factory applied coatings, transporting and laying in trenches and through openings in concrete work (but excluding concreting up) to line and level and jointing and testing the completed pipeline.”

PSL8.2.18 Supply Pipe Securing Straps (New payment item 8.2.18)

Add the following new payment item:

“8.2.18 Supply Pipe Securing Straps.....Unit: m
Pipe securing straps shall be supplied and complete in accordance with the drawings and specifications. The straps shall be measured per number of each size and type of strap supplied complete with holding down bolts, washers and neoprene rubber seating strips. Corrosion protection as specified shall be included in the rate.”

PSL8.2.19 Uplift, Place in Position on Support Structures, Joint, Test and Paint Steel Pipe work, Including Pipe Specials (New payment item 8.2.19)

Add the following new payment item:

“8.2.19 Uplift, place in position on support structures, joint, test and paint steel pipe work including pipe specials..... Unit: m

Pipe work supplied and delivered under Sub clause PSL 4.2.1 shall, where placed in position to line, level or grades on pipe support structures (support structures measured elsewhere) be measured and paid for under this item. The unit of measurement and the method of measurement shall be as given in Clause PSL 4.2.2. The rate shall include for uplifting from storage, repairing factory applied coatings, transporting, placing in position to line, level or grade including all necessary packing on pipe support structures and through openings in concrete work (but excluding concreting up). The rate shall also include for positioning synthetic rubber pads and for installing and bolting down pipe locating straps.

The rate shall include for bolting up flanges and couplings and for pressure testing. After testing the completed pipeline including all fittings, specials and valves shall be painted with two coats of high gloss polyurethane enamel to System K.”

PSL8.2.20 Cut into existing mains and/or structures (New payment item 8.2.20)

Add the following new payment item:

“8.2.20 Cut into existing Mains/Structure..... Unit: No

The cutting into existing mains and structures shall be measured by the number of each type and diameter of pipe cut into. Rate to include for all arrangements with relevant authorities and others affected. Rate to include costs of isolating, cutting into, fitting new, dewatering and protection against ingress of soil, stones and any other undesirable material.

PSLB BEDDING (PIPES)

PSLB3 MATERIALS

PSLB3.1 Selected granular material

Substitute with the following:

“Selected granular material shall be an aggregate, sand or granular material, all of a non-cohesive nature and free from organic material, of which the grading analysis shows 100% passing a 13.2mm sieve and not more than 5% passing a 0.075mm sieve. The Engineer may order the use of a graded non-plastic material for bedding and cradle in extreme wet conditions.”

PSLB3.3 Bedding

Add the following:

“All pipes shall be classified as rigid pipes and shall be laid on a class B bedding except water connections, which shall be classified as flexible pipes.”

PSLB3.4 Selection

PSLB3.4.1 Suitable Material Available from Trench Excavation

In the first sentence, after “selective methods of excavating”, add the following:
“, but shall be responsible for ensuring suitable materials are not contaminated”

PSLB3.4.2 Suitable Material not Available from Trench Excavation

Delete “within a distance not exceeding 0,5km” and replace with:
“within the Freehaul distance as specified in PSD5.2.5.1”

Add the following:

“d) from approved stockpiles on site.”

PSLB5 CONSTRUCTION

PSLB5.1 General

PSLB5.1.5 Method of Construction (New sub-clause 5.1.5)

Add the following new sub-clause:

“5.1.5 Method of Construction
Pipes shall be laid by either the trench method or the embankment method, as follows:

5.1.5.1 Trench Method. Where the overt level of the pipe is below the existing ground or embankment level, the pipe shall be laid by the trench method of construction, as specified in SANS 1200 DB and SANS 1200 LB as amended herein.

5.1.5.2 Embankment Method. Where the overt level of the pipe is above the existing ground or embankment level and the pipe is to be laid before the construction of the final embankment, the pipe shall be laid by the embankment method of construction, as follows:

- a) A trench of minimum 200 mm depth and width sufficient to accommodate the subsequent benched fill and bedding, shall be excavated and the base of the trench compacted to a minimum of 90% of modified AASHTO maximum density.
- b) The trench shall be backfilled with selected material suitable for trench backfill, as specified in SANS 1200 DB, compacted to at least 93% of modified AASHTO maximum density.

- c) Construct the selected fill in layers of not more than 150 mm compacted thickness using selected material of at least G7 quality as per TRH4, compacted to at least 93% of modified AASHTO density.
- d) Construct the specified bedding, which shall be Class B unless otherwise instructed, lay pipe on top of Selected Granular material and construct the fill blanket, all as specified in SANS 1200 LB, as amended herein.
- e) When constructing the final embankment adjacent to the pipe, the embankment shall be brought up equally on both sides of the pipe bedding fill and the pipe itself so as to avoid unequal loading on the fill and pipe.”

PSLB5.2 Placing and Compacting of Rigid Pipes

PSLB5.2.1 Class A Bedding

Delete second sentence of sub-clause (a), starting “During pipe laying . . .” and replace with:

“Concrete bedding shall extend for the full width of the trench and no side forms will be allowed, except where the embankment method of construction is necessary. A screed shall first be cast accurately to level and grade. Thereafter the pipe shall be supported on mounds of dry mix concrete placed under the pipe barrel and the pipe set to line and grade.”

PSLB5.4 Concrete casing to Pipes

Add the following:

“Concrete casing shall consist of Class 20/19 concrete.”

PSLB6.1 Moisture Content and Density

Add the following:

“The permissible deviations from OMC and density shall be Degree of Accuracy II.”

PSLB8 MEASUREMENT AND PAYMENT

PSLB8.1 Principles

PSLB8.1.5 Disposal of Displaced Materials

Delete the contents of the Clause and replace with :

“Material displaced by the pipeline and by importation of material from sources other than trench excavation shall either be incorporated in embankments or disposed of within the Freehaul distance as specified in PSD5.2.5.1.”

PSLB8.1.6 Freehaul

Delete the sub-clause and replace with the following:

“Except as provided for in 8.2.2.2 and 8.2.2.3, all transport within the site boundaries plus a further distance specified in the Bill of Quantity shall be considered Freehaul, as specified in

PSLB8.2 Scheduled items

PSLB8.2.1 Provision of Bedding from Trench Excavation

Delete “0.5 km” in the first sentence of the description and replace with: “the Freehaul distance as specified”

Delete "a Freehaul distance of 0.5 km" at the end of the first sentence of the description and replace with:

"the Freehaul distance as specified"

PSLB8.2.2 Supply Only of Bedding by Importation

PSLB8.2.2.4 From Approved Stockpiles on Site (New payment item 8.2.2.4)

Add the following new payment item:

"8.2.2.4 From approved stockpiles on site:

- a) Selected granular materialUnit: m³
- b) Selected fill materialUnit: m³

The rate shall include full compensation for all costs relating to the provision the required materials from approved stockpiles on site, including excavation, selection, transport within the Freehaul distance, offloading at the points required and disposal of the surplus material."

PSLB8.2.6 Embankments for Pipes (New payment item 8.2.6)

Add the following new payment item:

"8.2.6 Embankments for PipesUnit: m³

The rate shall include full compensation for all costs relating to the construction of pipe embankments where pipes are to be laid by the embankment method, as specified in PSLB2.1.1, including the provision of suitable materials from necessary excavations or stockpiles on site, selection, all transport within the Freehaul distance as specified, placing, processing, compaction and finishing."

PSLB8.2.7 STONE BEDDING

Add the following new sub-clause:

Stone bedding will be measured per cubic meter under the appropriate item in SABS 1200LB. Type A bedding (crushed stone wrapped in a geotextile blanket) shall be measured per linear metre along the centreline of the trench. The provision, operation and removal of (a) de-watering pump where authorized by the Engineer will be measured as dayworks under the appropriate item in Schedule 2.

PSLC1 SCOPE

Add the following:

“1.2 This specification also covers the excavation and backfilling of trenches for the installation of electrical and telecommunications cables not specifically contained in other ducts, where the laying of the cables will be undertaken by other parties.”

PSLC3 MATERIALS

PSLC3.5 Cables (New sub-clause 3.5)

Add the following new sub-clause:

“3.5 CABLES. The supply and laying of bedding and cables for electrical and telecommunication services not contained in ducts shall be undertaken by others and shall not be the responsibility of the Contractor.”

PSLC5 CONSTRUCTION

PSLC5.1 Excavation of Trenches

PSLC5.1.3 Trenches for Cables (New sub-clause 5.1.3)

Add the following new sub-clause:

“5.1.3 Trenches for cables. Trenches for cables not contained within ducts shall be excavated to the widths and depths indicated on the drawings in full compliance with the provisions of SANS 1200 LC, except that:

- a) The contractor shall excavate the trench to the specified width and depth, compact the base of the trench and then hand the trench over to other parties to construct the bedding and lay the cables.
- b) On completion of the laying of the cables and the fill blanket, the trench shall be handed back to the contractor for backfilling, which shall be undertaken using suitable excavated or selected material compacted to a minimum of 93% of modified AASHTO density.

In order to minimise delays to both the contractor and the party responsible for bedding and laying the cables, the contractor shall be required to constantly liaise with the other party regarding access requirements and programming of the works. In particular, the contractor shall familiarise himself with the programmed delay between excavating and backfilling the trench to provide the party laying the cables access. No claims for delays to either party as a result of poor communication will be entertained”

PSLC8 MEASUREMENT AND PAYMENT

PSLC8.2 Scheduled items

PSLC8.2.2 Excavation

Delete sub-item (a) and replace with the following:

- “a) Excavate in all materials, backfill, compact and dispose of surplus material, for:
 - i) Trenches to the widths and depths indicated on the drawings for cable Unit: m³
 - ii) Trenches to the widths and depths indicated on the drawings for cable to be laid by others unit: m³

The description of the rates shall be as per the standard payment item SANS 1200 LC, 8.2.2(a), except that the rate for (ii) shall also include full compensation for the delay between the excavation of the trench and the backfilling after the laying of cables by others and for all extra liaison, planning and programming that may be required to undertake the works as specified.”

PSLE STORMWATER DRAINAGE

PSLE3 MATERIALS

PSLE3.1 Culvert Units and Pipes

PSLE3.1(a) Precast Concrete Pipes

Add the following:

“All concrete pipes shall be reinforced concrete pipes class 100D and shall have Ogee joints.”

PSLE3.1(d) Skewed Ends

Add the following:

“Skew ends shall be cut on site and an approved epoxy coating shall be applied to the cut ends immediately after cutting.”

PSLE5 CONSTRUCTION

PSLE5.2 Bedding and Laying

PSLE5.2.1 General

Add the following:

“Pipe culverts shall be laid by either the trench method or the embankment method in accordance with PSLB2.1.1, as directed.”

PSLE5.8 Removal of existing pipes (New sub clause 5.8)

Add the following new sub-clause:

“5.8 REMOVAL OF EXISTING PIPES. Where existing stormwater pipes require to be removed to move an inlet or outlet structure or for any other reason, excavation of the trench and the removal of the pipe shall be undertaken with sufficient care and diligence to avoid damaging the pipes.
The resultant excavation shall be backfilled using selected layer quality material compacted to a minimum of 93% of modified AASHTO density in layer thicknesses of not more than 200 mm.
Where the existing pipes are to be reused, they shall be neatly stacked in a designated stockpile site and the stack secured using metal stakes or some other approved method to ensure that the pipes cannot move. Otherwise the pipes shall be disposed of in an approved dump site, as directed by the Engineer.”

PSLE5.9 Connecting into new stormwater systems (New sub-clause 5.9)

Add the following new sub-clause:

“5.9 CONNECTING INTO NEW STORMWATER SYSTEMS. Where new stormwater pipes are to be connected into existing manholes, junction boxes, kerb inlets, etc, an opening of just sufficient size to accommodate the pipe shall be carefully broken into the wall of the existing drainage structure using an appropriate, approved method. Due care and diligence shall be taken to ensure that the drainage structure is not damaged in the process and any damage shall be repaired at the Contractor’s cost.
The pipe shall be placed in the opening to the correct line and level with the end of the pipe flush with the internal surface of the wall. If the pipe needs to be cut to obtain the correct length, the cutting shall be by means of saw cutting and the cut end of the pipe shall be treated with an approved epoxy coating.”

After placing the pipe, before the construction of the fill blanket, the remaining gaps around the pipe shall be grouted with an approved cementitious grout and the internal wall of the drainage structure neatly finished to the approval of the Engineer.”

PSLE8 MEASUREMENT AND PAYMENT

PSLE8.2 Scheduled items

PSLE8.2.14 Remove Existing Concrete Pipe Culverts (New payment item 8.2.14)

Add the following new payment item:

“8.2.14 Remove Existing Concrete Pipe Culverts

- a) To temporary stockpile for reuse Unit: m
 - b) To spoil Unit: m
- The tendered rate shall include full compensation for all plant, labour, materials, transport and other incidentals required for the careful excavation, removal and stacking of existing concrete pipe culverts and the backfilling of the resultant excavation if required.”

PSLE8.2.15 Relay Existing Concrete Pipe Culverts ex Stockpile (New payment item 8.2.15)

Add the following new payment item:

“8.2.15 Relay Existing Concrete Pipe Culverts ex Stockpile....Unit: m
Separate items will be scheduled for each Class of bedding and each pipe diameter.
The rate shall include full compensation for all plant, labour, transport and other incidentals required for supplying, laying, bedding and jointing of existing pipes placed in temporary stockpiles.

PSLE8.2.16 Demolish and Dispose of Existing Stormwater Structures (New payment item 8.2.16)

Add the following new payment item:

“8.2.16 Demolish and dispose of existing stormwater structures:
a) Kerb Inlet Structure Unit: No
b) Grid Inlet Structure Unit: No
c) Cut and remove to spoil 225 mm diameter uPVC pipes underneath the corner slab of channel and sealing of openings using cement mortar Unit: No
d) Concrete lined open channels Unit: m²

The provisions of Clause PSC 1.2 shall apply. The tendered rate shall include full compensation for all plant, labour, materials, transport and other incidentals required for the demolition and disposal of existing stormwater structures and the backfilling of the resultant excavation using selected layer quality material compacted to 93% of modified AASHTO density.”
In the case of (c), the rate shall include cutting off uPVC pipes from both sides and disposal there of resulting pipe sections.

PSLE8.2.17 Breaking through existing manhole and Connecting into Stormwater Systems (New payment item 8.2.17)

Add the following new payment item:

“8.2.17 Breaking through existing manhole and Connecting into Stormwater Systems (525 mm diameter)Unit: No

The rate shall include full compensation for building the new stormwater pipes into existing manhole structures in accordance with PSLE5.9, including breaking through into existing manholes, saw cutting the pipe if required, grouting complete.

The rate shall however exclude the laying and bedding of the pipe, which shall be covered by the relevant payment items, except that the cost of any extra care and diligence required will be deemed to be included in this rate.”

PSLG PIPE JACKING

PSLG 8.2 Scheduled Items

Add the following new payment Item

PSLG 8.2.11 Allow for pipe jacking of (Diameter indicated in Bill of Quantity) diameter concrete sleeve pipe complete.....Unit m

The rate shall cover the cost of jacking establishment, excavation for jacking, supplying of pipes to be jacked and jacking of pipe all complete. This shall include handling, positioning of the pipes, the jacks, and subsidiary materials, the labour necessary for jacking the pipes through all materials foreseen in the project specification or as scheduled, sealing grouting holes in the pipe barrels, bentonite injection (if necessary), intermediate jacking pipes and ancillary jacking equipment (or, alternatively, intermediate jacking stations, in which case the rate shall cover the construction of junction boxes as closures between pipe ends).

PSME3.2.1 Subbase material

Replace the contents of paragraph (a) with the following:

"(a) The maximum particle dimension of the gravel shall not exceed 63 mm."

Replace the contents of paragraph (d) with the following:

"(d) The CBR at specified density shall be 45 for unstabilized material as well as for stabilized material prior to stabilization."

Delete paragraph (e).

PSME3.2.2 Gravel shoulder and gravel wearing course material

Replace the contents of this sub-clause with the following:

"The material used for gravel shoulders and gravel wearing course shall comply with the following:

- (a) The PI shall not be less than 6 and not more than $(3 \times GM) + 10$.
- (b) The maximum particle dimension of the gravel shall not exceed 40 mm.
- (c) The CBR shall be greater than 15 at 93% of modified AASHTO density."

PSME5 CONSTRUCTION

PSME5.2.2 Borrow pits

Insert the words "designated by the Engineer and" between the words "pits" AND "established" in the first line.

PSME5.4 PLACING AND COMPACTION

PSME5.4.4 Compaction

PSME5.4.4.3 Preparation and Compaction at Tie-in to Existing Layers (New Sub-Clause 5.4.4.3)

Add the following new sub-clause after sub clause 5.4.4.2

- "5.4.4.3 Preparation and Compaction at Tie-in to Existing Layers. Where new layer works tie in to existing layer works, the following procedure is to be followed:
- a) The kerbing and sidewalk/verge material shall be removed carefully over a length sufficient to facilitate the tie-in and, where suitable, stockpiled adjacent to the road for reuse.
 - b) The in-situ materials shall be carefully excavated to expose the end or edge of the existing layer works, as applicable. Where existing layer works are stepped, great care shall be taken not to damage the steps.
 - c) The existing layer works shall be cut back in steps of at least 150mm between the ends of successive layers to sound well-compacted layers. In the case of asphalt and stabilised layers, and possibly the crushed stone base, the full depth of the existing layer shall be saw cut to produce a neat vertical face.
 - d) Material for the new pavement layers shall be placed and compacted in such a manner that a neat, level well-compacted joint is formed. When compacting the new adjacent layers, care must be taken not to cross onto the existing layer until at least 5 roller passes have been undertaken on the new layer.
The compaction and finish of the joint of each layer shall be inspected and tested by the Engineer and the Contractor shall undertake whatever remedial measures that may be instructed, at his cost, should the finish or compaction of the joints be found to be unacceptable. A separate payment item is provided for the extra care, effort and compaction that are required to meet the above requirements."

PSME5.7 Transport

Delete sub-clauses 5.7.1 and 5.7.2 and replace with the following:

"All transport within the boundaries of the site, plus an additional distance as specified shall be considered Freehaul. Transport in excess of the Freehaul distance shall be measured as Limited and Long Overhaul, as per SANS 1200 D, sub-clause 5.2.5.2, as amended herein."

PSME6 TOLERANCES

PSME6.1 Dimensions, levels, etc

PSME6.1.2 Grade

Change "50 mm" in the first line to "25 mm".

Delete the "." at the end of the sub-clause and add the following:

"and 90% of all deviations from the designated levels shall be within the range +0mm, -15mm.

The permissible deviation in grade from the designated grade, shall be:

$PD(\%) = 0,5\sqrt{\ell}$, where ℓ is the length of pavement under review."

PSME6.1.4 Thickness

Add the following to the second line after "specified thickness":

"and not greater than 5mm more than the specified thickness."

Delete the "." at the end of the sub-clause and add the following:

"and not greater than 20mm more than the specified thickness."

PSME6.1.5 Cross Section

Change "25mm" to "15mm" in sub-clause 6.1.5.1

PSME7 TESTING

PSME7.2 PROCESS CONTROL, ROUTINE INSPECTION AND TESTING

PSME7.2.1 Process Control

Add the following after the end of the first sentence:

"A signed copy of the test results shall be submitted to the Engineer's Representative within the following period after completion of the layer in question:

- | | | | |
|----|---------------------|---|------------------|
| a) | Relative Compaction | : | 24 hours |
| b) | Indicator Tests | : | 48 hours |
| c) | CBR/UCS | : | 8 Calendar days" |

Change the value of the minimum number of tests per lot in Table 2 as follows:

- | | | | |
|----|---------------------|---|---|
| a) | Relative Compaction | : | 6 |
| b) | Indicator Tests | : | 2 |
| c) | CBR/UCS | : | 2 |

PSME8 MEASUREMENT AND PAYMENT

PSME8.1 Basic Principles

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

Amend paragraph (d) as follows:

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

PSME8.3 Scheduled Items

The following sub-item is to be included in sub-clauses 8.3.1; 8.3.2(a); 8.3.2(b); 8.3.2(c); 8.3.3:

- i) G6 natural gravel sub base compacted to 95% of Mod. AASHTO maximum density Unit: m³

PSME8.3.2 Construct the subbase course/shoulders/gravel wearing course with material from designated excavations

Replace the contents of sub-item (a) with the following:

"The rate for (a) shall include full compensation for excavating and selecting subbase material, for loading and transporting the material within the free-haul distance, and for either placing the material on the road or stockpiling the material for later use. When material is stockpiled, the rate shall include compensation for shaping and grading the stockpile so that it is free-draining."

PSME8.3.3 Construct the subbase course/shoulders/gravel wearing course with material from commercial sources or designated borrow areas

Replace the heading of this item with the following:

"PSME 8.3.3 Construct the subbase course/shoulders/gravel wearing course with material from commercial sources"

Add the following paragraph:

"This item shall also apply to the construction of subbase course/shoulders/gravel wearing course with material from borrow pits selected by the Contractor."

PSME8.3.11 Preparation and Compaction at Tie-in to Existing Layers (New Sub-clause 8.3.11)

Add the following sub clause after sub-clause 8.3.10

"8.3.11 Preparation and Compaction at Tie-in to Existing Layers

- i) G6 natural gravel sub-base Unit : m
The unit of measurement shall be the linear metre of existing subbase layer into which the new sub base is to be tied in, measured across the road.
The tendered rate shall include full compensation for all plant labour, materials and other incidentals required for the extra care, effort and time taken in excavating and cutting back existing layers and compacting the layer adjacent to the existing layers without damage to the existing layer works.
This item will only be payable where the Engineer has indicated in writing that he is satisfied that the Contractor has taken due care and has finished and compacted to the correct specification without damaging the existing layers."

PSMF BASE

PSMF3.3 Physical and Chemical properties

PSMF3.3.1 Natural gravel (stabilized or unstabilized)

Replace the contents of paragraph (a) with the following:

"(a) The maximum particle dimension of the gravel shall not exceed 63 mm."

PSMF5 CONSTRUCTION

PSMF5.4 Placing and Compaction

PSMF5.4.6 Preparation and Compaction at Tie-in to Existing Layers (New sub-clause 5.4.6)

Add the following new sub-clause:

"5.4.6 Preparation and Compaction at Tie-in to Existing Layers. Where the new base is to be tied into existing roadwork's, the preparation and compaction of the layer at the tie-in shall be undertaken in accordance with PSME1.1.2."

PSMF5.5 Stabilisation

Add the following:

"The type of stabilising agent and the rate of application thereof shall be determined by laboratory testing prior to construction of the layer. For tendering purposes however, CEM II 32.5, applied at a rate of 3.0% by mass shall be assumed."

PSMF8 MEASUREMENT AND PAYMENT

PSMF8.3 Scheduled items

PSMF8.3.2(b) The following sub item is to be included in sub clauses 8.3.2(b).

- 1) C4 Quality stabilised base compacted to 97 % of Mod AASHTO maximum density.

PSMF8.3.13 Preparation and Compaction at Tie-in to Existing Layers (New sub-clause 8.3.13)

Add the following sub clause after sub-clause 8.3.12

"8.3.13 Preparation and Compaction at Tie-in to Existing Layers

- i) C4 Quality stabilised base Unit : m
The unit of measurement shall be the linear metre of existing base layer into which the new base is to be tied in, measured across the width of the road.
The tendered rate shall include full compensation for all plant labour, materials and other incidentals required for the extra care, effort and time taken in excavating and cutting back existing layers and compacting the layer adjacent to the existing layers without damage to the existing layer works.
This item will only be payable where the Engineer has indicated in writing that he is satisfied that the Contractor has taken due care and has finished and compacted to the correct specification without damaging the existing layers."

PSMJ SEGMENTED BLOCK PAVING

PSMJ3 MATERIALS

PSMJ3.1 Units

PSMJ3.1.3 Reuse of Existing Units (New sub-clause 3.1.3)

Add the following new sub-clause:

"3.1.3 Reuse of Existing Units. Units removed from existing paving shall be carefully inspected for damage and if suitable thoroughly cleaned and then stacked in an approved site within the Freehaul distance. Only units which are not cracked, chipped, discoloured or otherwise damaged or unsuitable for reuse shall be cleaned and stacked for reuse. All other units shall be removed directly to spoil. Units damaged by the Contractor on removal as a result of a lack of care and diligence shall be replaced with units of the same type and quality, at the Contractor's cost.
Measurement and payment for the removal and stacking or disposal of existing units shall be made under SANS 1200 C, Site Clearance."

PSMJ8.2.2 Construction of paving complete

Add the following:

"The tendered rate shall also include full compensation for cutting units to fit edge restraints and for the removal of waste material from the Site."

PSMK KERBING AND CHANNELLING

PSMK3 MATERIALS

PSMK3.2 Precast Kerbing and Channelling

PSMK3.2.1 General

Add the following:

“Notwithstanding anything to the contrary in the Specifications or in the Schedule of Quantities all kerbs shall be precast kerbs except on curves where the radius is less than 1 m.”

PSMK3.7.2 Concrete

Add the following:

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

PSMK3.9 Bedding Material

Delete this sub-clause and substitute:

“The material on which the precast concrete kerbs and channels are bedded shall consist of a 1 to 8 cement sand mix, except that where the layer is more than 30mm thick, bedding shall be Class 15 /13 concrete.”

PSMK5 CONSTRUCTION

PSMK5.1 Excavation and Bedding

Delete the first paragraph and substitute:

“Kerbing and channelling shall be constructed on the road subbase layer.”

PSMK5.2 Precast Concrete Kerbing and Channelling

Delete the words “50mm thick” from the second line of this sub-clause.

Delete the last paragraph of this sub-clause and substitute:

“After the grouting of kerb joints has been completed, the kerbs shall be backed with a well-punned Class 15/13 concrete to the dimensions as shown on the drawings. On curves of radius less than 20 meters the concrete backing shall be continuous, and, on curves of radius greater than 20 meters and on straights the concrete backing shall be placed across the joints and shall extend a minimum of 150mm in each direction from the joints.”

PSMK5.13 Re-use of existing precast kerbing (New sub clause 5.13)

Add the following new sub-clause :

“5.13 Re-use of existing precast kerbing. The Contractor and the Engineer together shall inspect the existing precast concrete kerbs for damage, prior to commencement of any works on the site.
Each individual kerb displaying obvious signs of damage, which is considered by the Engineer to render the unit unsuitable for reuse shall be clearly marked using red paint and recorded. On commencement of removal of the existing kerbs, these damaged units, including the associated haunching and bedding, shall be removed from the road, directly to spoil.
Existing precast units which are not damaged and are considered suitable for reuse shall be carefully removed, cleaned and stockpiled in an approved site for re-use. The associated haunching and bedding shall however be removed directly to spoil.

The Contractor is to note that due care must be exercised in removing existing undamaged units, as the replacement of units damaged during removal, exceeding 5% of the total number of previously undamaged units, shall be for his own cost. Units damaged during removal, including the associated haunching and bedding, shall be removed directly to spoil and shall not be taken to stockpile.

Payment for new precast units required to replace damaged existing units shall only be made in respect of those units identified and marked as damaged prior to commencement of construction and in respect of a maximum of 5% of the total number of undamaged units.”

PSMK8 MEASUREMENT AND PAYMENT

PSMK8.2 Scheduled Items

PSMK8.2.1 Concrete Kerbing (8.2.1)

Delete the contents of clause 8.2.1(a) and replace with the following:

The unit of measurement shall be the linear metre of kerbing regardless of being straight or curved complete as specified, measured along the front face of the kerb.

The tendered rate for each metre of kerb shall include full compensation for all transport, plant, labour, materials and other incidentals for the necessary excavation, preparation, bedding, procurement, laying, haunching, backfilling, jointing, protecting against staining, and all other activities, complete as specified.

C.3.5.8 PARTICULAR SPECIFICATIONS

C3.5.8.1 PARTICULAR SPECIFICATION FOR MECHANICAL WORKS

INDEX TO PARTICULAR SPECIFICATIONS FOR MECHANICAL WORKS FOR SEWER BOOSTER PUMPSTATION

PLN:	Manufacture, supply and testing of steel pipes
PLQ:	Corrosion protection of steel pipes and fittings
PTV:	Corrosion protection
PLC:	Chemical dosing equipment
PLKA:	Sluice and channel gates, adjustable weirs, handstops, stoplogs
PLT:	Online flow meters
PTT:	Rapid gravity sand filters
PTU:	Chlorine dosing equipment
PTW:	Electrical actuators
PU:	Building work
PUA:	Painting

PLN: MANUFACTURE, SUPPLY AND TESTING OF STEEL PIPES

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PLN 5	DIMENSIONAL REQUIREMENTS
PLN 6	TESTING AND INSPECTION AT MANUFACTURER'S WORKS AND AT SITE
PLN 7	FLANGES
PLN 8	FLEXIBLE COUPLINGS AND FLANGE ADAPTORS
PLN 9	MARKING OF PIPES
PLN 10	INSTALLATION
PLN 11	MEASUREMENT AND PAYMENT

PLN MANUFACTURE, SUPPLY AND TESTING OF STEEL PIPES

PLN 1 SCOPE

This specification covers the manufacture and supply of bare, electric welded low carbon steel pipes and steel pipe special items for the conveyance of water at ambient temperatures and at medium pressures.

PLN 2 STANDARDS

Pipes and specials shall be manufactured, tested and inspected in accordance with the latest issues of the following standard specifications unless amended in subsequent clauses in this specification.

a) Pipes

SABS 719: Steel Grades A, B and C
SABS 1431: Steel Grades 300 WA
API 5L: Steel Grades, X42, X46, X52, X56 and X60

b) Specials

- Specials of 150 mm nominal diameters and smaller to be manufactured with pipe conforming to SABS 62 (heavy duty) or ASTM Schedule 40 to suit specified pressures.
- Specials larger than 150 mm nominal diameter shall be manufactured from pipes complying with this specification.
- The radiographic technique, adjudication of radiographs and repair of defects shall be in accordance with API 1104.

c) Qualifications of Welders

All manual or semi-automatic welds and repair welds shall only be undertaken by welders qualified under the tests laid down in accordance with API 1104.

d) Non-destructive Tests and Adjudication

- Radiographic inspection: API 1104
- Ultrasonic inspection: API 5L

e) In this Specification reference is made to the latest issues of the following specifications:

SABS 719
API 5L
API 1104
ASME Section V
BS 2971
BS 2633

PLN 3 STRESSES

- a) All pipes shall be hydrostatically tested as described in PLN 6.5 to a pressure such as to produce a circumferential tensile stress in the steel of not less than 90% of the minimum yield stress.
- b) The design stress for pipes subjected to the specified design pressures shall be 60% of the minimum yield stress of the steel.

PLN 4 PROCESS OF MANUFACTURE FOR PIPES

PLN 4.1 Pipes shall be manufactured by an approved semi-automatic submerged-arc welding process or shall be electric resistance welded. Where semi-automatic submerged-arc welding is employed, at least one pass shall be made on the inside and at least one pass on the outside. The number of longitudinal weld seams shall not exceed:

- a) one seam for pipes up to 1 000mm nominal diameter
- b) two seams for pipes larger than 1 000mm and up to 2 000mm nominal diameter

Circumferential welds by semi-automatic submerged-arc welding method for factory double jointed pipes shall have at least one pass on the inside and at least one pass on the outside.

PLN 4.2 Welds

SABS 719, BS 2971 and BS 2633 shall generally apply.

For fusion welded pipes and specials, the internal weld bead shall not protrude more than 1mm into the bore of the pipe or special.

For electric resistance welded pipes, the height of upset metal and flash on the inner surface shall not exceed 1,0mm.

For pipes to be joined by butt welding, the internal weld bead shall be ground flush with the pipe body for a length of 200mm from ends to be jointed.

For pipes to be coupled by flexible couplings, external weld reinforcement or upset metal and flash shall be ground flush with the pipe body for a length of 200mm from the end to be coupled.

PLN 5 DIMENSIONAL REQUIREMENTS

PLN 5.1 Pipes

All dimensions will be in accordance with SABS 719 clause 4.

PLN 5.2 Specials

The tolerances on specials will be in accordance with BS 534, Section 4.

Unless shown otherwise, branch and manifold sections of Tees to have a common centre line and of Scour Tees to have a common invert line.

All dimensions on layout drawings or item details are outer face to outer face, i.e. overall.

Position dimensions for puddle flanges and restraining flange refers to centre of flanges.

PLN 6 TESTING AND INSPECTION AT MANUFACTURER'S WORKS AND AT SITE

PLN 6.1 General

Factory and Site inspection, supervision of tests and adjudication of test records shall be carried out by an independent Inspectorate.

All tests and inspections at the factory and on site shall be at the expense of the Contractor who shall provide all necessary testing facilities, labour, instruments, equipment and samples that might be required, free of charge.

The Inspectorate shall be afforded every facility during the course of manufacture and testing to enable the inspection to be carried out effectively.

All test samples shall be selected by the appointed Inspectors and all instruments used for testing purposes shall be approved by the Inspectors and if in the opinion of the Inspectors any instrument should require calibration, such instruments shall be calibrated at the expense of the Contractor by the SABS or such other body as may be approved by the Inspectorate.

No mechanical working or straining of pipes and specials shall be allowed after testing and inspection.

PLN 6.2 Visual Inspection

All finished pipes and specials shall be visually examined and shall be free of injurious defects as defined in API 5L Section 9.7.

PLN 6.3 Non-destructive Inspection

PLN 6.3.1 Ultrasonic Inspection

Pipes shall be made by an approved welding process and 100 percent of all longitudinal or spiral welds on straight pipes shall be checked with an approved ultrasonic method capable of continuous and uninterrupted inspection of the weld seam in accordance with API 5L Section 9.10, 9.11 and 9.12 except that the equipment shall be checked with an applicable reference standard at least twice every working run.

PLN 6.3.2 Radiographic Inspection

a) Longitudinal Weld Pipe

All electric fusion welded pipes, shall be inspected by radiological methods for a distance of 200 mm from each pipe end.

b) Spiral Weld Pipe

All electric fusion welded pipes shall be inspected by radiological methods for a distance of 100 mm from each end of each length of pipe and of the complete "H" at all scalp and welds including 150 mm of the spiral welds in both directions away from the intersection points with the scalp and welds.

c) Circumferential Butt Welds

100 percent of the length of circumferential butt welds shall be examined unless consistently acceptable results are obtained. Then the number of welds so to be tested may be reduced by mutual agreement between the Engineer, the Inspectorate and the Contractor.

d) Specials

100 percent of all manual or semi-automatic welds in specials shall be examined radiographically unless consistently acceptable results are obtained. Then the number of welds so to be tested may be reduced.

Where specials cannot be hydrostatically tested, all welds shall be liquid penetrate tested as per ASME Section V.

e) Repairs

Straight Piping:

100 percent of the total length of all repairs shall be examined radiographically unless repairs are done prior to ultrasonic inspection and such repairs pass ultrasonic inspection. Then no radiographic inspection of same is required.

f) Pipes for Rail, Road and River Crossings: 100 percent of the total length of all welds shall be examined radiographically.

PLN 6.4 Hydrostatic Testing

- a) Each individual straight pipe shall be subjected to a hydrostatic test in accordance with the methods described in API 5L, Section 9.5. Test pressures shall be such as to produce tensile fibre stresses in the pipe wall of not less than 90% of the minimum specified yield strength of the steel or shall be 9 MPa whichever is the lesser. Leaks or sweats shall be considered injurious defects.

- b) Should it not be possible to hydrostatically test straight piping and/or specials the through liquid penetrate test as per ASME Section V shall be done on all welds over and above the non-destructive tests specified above. This shall only be applicable with the prior written approval of the Engineer.

PLN 6.5 Repair of Injurious Defects

Injurious defects found by non-destructive testing of welds, visual examination, hydrostatic testing or determined by any other means to exceed the limitations in API 5L, Section 9.8 shall be repaired in accordance with API 5L Section 9.8.5 but subject always to the requirements of this specification.

PLN 6.6 Destructive Testing

PLN 6.6.1 The following destructive tests shall be performed in accordance with SABS 719 clause 7.2 on the first pipe and thereafter on one pipe of each 500 subsequent pipes.

- a) Transverse Tensile Test
- b) Root Bent Test (Electric Fusion Welds)
- c) Flattening Test (Electric Resistance Welds)

PLN 6.6.2 Sampling for Destructive Tests

- a) **First Sample**

A section long enough to provide all the test specimens and material shall be cut from the selected pipe.

- b) **Second Sample**

If the test specimens and material from the first selected pipe fail to pass any of the tests, a section long enough to provide the appropriate specimens for the tests failed by the first sample shall be cut from two further pipes.

- c) **Third Sample**

If the test specimen from the second sample fails to pass the test(s) a similar section shall be cut from each of a further ten pipes.

- d) **Compliance**

The piping shall be considered as complying with the specification if after testing of the first or the second or the third sample no defect is found.

PLN 7 FLANGES

- a) Material shall be steel plates to conform to the requirements of SABS 1123 (1977), unless otherwise specified.
- b) Dimensions and drilling shall be in accordance with SABS 1123 (1977) unless otherwise specified. Flanges for 64 bar working pressure shall be in accordance with BS4504:1969. Dimensions not covered by SABS 1123 and BS4504, shall be in accordance with NWS 1676 Revision 0.
- c) All flanges shall be of the steel-plate for welding type and shall have flat joint faces unless otherwise specified.
- d) Connecting surfaces shall be in accordance with SABS 1123 clause 4.5.
- e) Puddle flanges need not be drilled. Where puddle flanges are slanted to an item, special flanges are required. Such flanges need not be circular, but shall meet the specified pressure rating and must protrude at least 100 mm outside item outer wall.

- f) Provide appropriate bolt units, consisting of a standard length bolt, nut and two washers of a material to conform to the requirements of SABS 1123 where applicable, otherwise to the requirements of the Engineer for each set of flanges and for flange adaptor to flange installations.

NB: The shortest standard bolt or stud that protrudes beyond the nut by a minimum of two threads, when the assemblies are fully tightened, shall be used. A washer shall be fitted under all bolt/screw heads and nuts.

- g) Gaskets for flanged connections shall be of compressed asbestos fibre to BS 2815 Grade A, ring type with a minimum thickness of 3 mm, unless otherwise specified.
- h) Should certain equipment e.g. valves, etc. only be supplied with specific flange drilling, the Contractor must arrange for adjacent flanged items to have the same drilling prior to the manufacture of such items.
- i) Some flexible couplings to be restrained by means of a restraining flange. The diameter, number and length of the long restraining bolts as well as any possible pipe wall thickening to be designed by manufacturer for specified pressures. The seal retaining flange on the flexible coupling may be factory machine scalloped to accommodate the long bolts. Provide all the necessary nuts, washers, etc. for the restraining bolts.

Restraining flanges need not have all the bolt holes specified in the applicable flange drilling table. Only those required for the long restraining bolts need to be provided; these holes should, however, comply with the applicable flange drilling table and be spaced equally on the flange PCD and symmetrically around the flange centre lines.

Restraining bolts to be positioned so as to not clash with any stubs specified for an item.

- j) Blank flanges for pipes equal to or greater than 400 dia to be provided with two approved lifting handles.

PLN 8 FLEXIBLE COUPLINGS AND FLANGE ADAPTORS

Flexible couplings and flange adaptors shall be the Viking Johnson or Klamflex type.

Manufacture of straight and stepped couplings (SR-C + ST-C) as well as flange adaptors (FA) to be approved by Engineer. Couplings must be able to withstand hydrostatic test pressures of 1.5 times the specified design pressures and coupling flanges must be designed to withstand all stresses due to tightening of the bolts. Rubber rings shall generally comply to SABS 974 Class F. Flexible couplings shall be supplied complete with all necessary bolts, nuts and rubber jointing rings.

Coupling installation gaps to be to approved supplier's specification.

All flange adaptors:

- Studs may not be welded onto flange.
- Flange to be drilled and tapped for threaded studs where applicable.
- Drilling to suit connecting flange.
- NB – specified maximum working pressure to always apply.

PLN 9 MARKING OF PIPES

All pipes and specials shall be clearly hand stamped alongside a longitudinal or spiral weld on one end of the pipe with the following.

- a) Grade and thickness of steel
- b) Serial number of the pipe or specials
- c) Nominal diameter

d) Hydraulic test pressure

PLN 10 INSTALLATION

Pipework shall be manufactured and installed by qualified and competent persons and must be of good workmanship, solidly supported, 100% on line and level, in a proper working order and must comply with the prescribed specifications and accepted engineering practice.

The Contractor shall ensure that pipework has the necessary support during and after installation so that it is at all times correctly aligned.

Any/all damage to corrosion protection during the handling, installation and commissioning of pipework and associated valves and fittings shall be repaired by the Contractor at no additional cost to the Employer. Repair work shall be executed in terms of the Specification to the approval of the Engineer or appointed corrosion consultant.

PLN 11 MEASUREMENT AND PAYMENT

The supply and installation of steel pipe items shall be measured as follows:

PLN 11.1 Design, Drawings and General

Pay Item	Unit
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PLN 11.1.1 Provide design drawings and design information as specified	Sum
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PLN 11.2 Supply and Delivery to Site

Pay Item	Unit
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PLN 11.2.1 Pipe items as specified on the drawings or relevant pipe item Schedules	No
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PLN 11.2.2 Ancillary equipment such as instrumentation, pipe supports (to be specified)	Sum
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PLN 11.3 Installation Work

Pay Item	Unit
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PLN 11.3.1 Pipe items as specified on relevant drawings	Sum
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PLN 11.3.2 Ancillary equipment such as instrumentation, pipe supports (to be specified)	Sum
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PLQ: CORROSION PROTECTION OF STEEL PIPES AND FITTINGS

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PLQ CORROSION PROTECTION OF PIPS AND FITTINGS

PLQ 1 SCOPE

This specification covers various corrosion protection systems for cast iron, steel and stainless-steel pipes and fittings for the conveyance of water at ambient temperatures.

PLQ 2 CORROSION PROTECTION SYSTEMS

The following corrosion protection systems shall apply unless otherwise specified on the drawings, project specifications and schedule of quantities.

PLQ 2.1 Buried steel pipework

a) Pipe diameter up to 150mm

Pipework shall be hot-dipped galvanized, unless otherwise specified.

After installation, the pipework shall be protected with a Denso HT Petrolatum tape wrapping system as specified in this specification.

b) Pipe diameter larger than 150mm

Specials, fittings and couplings shall be lined and coated with epoxy paint.

After installation the pipes and fittings shall be protected with the Denso HT Petrolatum tape wrapping system as specified in this specification.

Standard pipe lengths shall be lined with epoxy paint and coated with fusion bonded, medium density polyethylene (MDPE) or fibre bitumen as specified in this specification.

PLQ 2.2 Pipework inside chambers

- a) Pipe diameter up to 150mm

Pipework shall be hot-dipped galvanized.

The outside end of fittings cast into the walls of the chamber shall be protected with a Denso HT Petrolatum tape wrapping system.

- b) Pipe diameter larger than 150mm

Fittings, specials and couplings shall be coated and lined with epoxy paint.

The outside end of the fitting cast into the wall as well as couplings outside the chamber shall be protected with a Denso HT Petrolatum tape wrapping system.

PLQ 2.3 Pipework exposed to sunlight

- a) Pipe diameter up to 150mm

Pipework shall be hot-dipped galvanized.

Pipe surface shall be prepared for re-coatable polyurethane site application.

After installation the pipe shall be painted with re-coatable polyurethane to the Employers colour coding specification.

- b) Pipe diameter larger than 150mm

Pipework shall be lined with epoxy paint.

Pipes shall be coated in the factory with UV-resistant, multi-purpose epoxy paint.

After installation the pipe shall be painted with re-coatable polyurethane to the Employers colour coding specification.

PLQ 2.4 Exposed pipework inside buildings

- a) Pipe diameter up to 150mm

Pipework shall be hot-dipped galvanized.

Pipe surface shall be prepared for re-coatable polyurethane site application.

After installation the pipe shall be painted with re-coatable polyurethane to the Employers colour coding specification.

- b) Pipe with diameter larger than 150mm

Pipes, fittings and couplings shall be lined and coated with epoxy paints.

After installation the pipework shall be painted with re-coatable polyurethane to the Employers colour coding specification.

PLQ 2.5 Pipework inside water retaining structures

All stainless-steel pipework inside water retaining structures and cast into the walls of water retaining structures shall be lined and coated with epoxy paint.

Steel pipes to be cast into concrete inside the reservoir and below the reservoir floor shall be lined with epoxy paint. The paint shall be continued around the edges up to 100mm into the concrete encasing. The remainder of the surface to be cast into the concrete shall be left uncoated.

Uncoated portions of pipes must be protected with a primer which complies with SABS 926. The primer must be applied so that it has a dry thickness of 50 µm.

PLQ 3 SURFACE PREPARATION

Contractors must submit information on the cleaning methods to be used in meeting the specified requirements. Contractors must further provide the Engineer with the manufacturer's guarantee that the requirements have been met.

PLQ 3.1 Surface preparation of steel surfaces

All projections, sharp edges, layers that have formed and tool marks must be removed from the surface so that the surface is smooth, and it must be cleaned in accordance with sections 2, 3 and 4 of SABS Code of Practice 064 so that it meets the following requirements:

- (a) A grade of cleanliness of at least Sa 2½ when tested by SABS test method 767.
- (b) A surface profile between 50µm and 90µm when tested by SABS test method 772.
- (c) Free from dust and debris to at least 0,2% when tested by SABS test method 769.

PLQ 3.2 Surface preparation of galvanized surfaces

Surfaces to be coated shall not be passivated.

Galvanized steel surfaces shall be degreased prior to coating, using either a water soluble solvent degreaser in accordance with SABS 1344 and the manufacturer's instructions, or a mild acid-detergent degreasing solution to be approved by the Engineer.

Large areas shall be prepared by sweep-blasting with non-metallic abrasive. Cracking, flaking or any form of de-lamination of the zinc coating due to excessive blast-cleaning shall not be permitted. Removal of zinc by blast-cleaning shall not exceed 10 µm.

Surfaces that cannot be sweep-blasted shall be abraded manually or mechanically with abrasive paper grade 220 or by using non-metallic abrasive pads.

Finally, all dust and debris shall be removed by vacuum-cleaning.

Epoxy primer for galvanised surfaces shall be applied immediately after surface preparation to a minimum dry thickness of 50 µm.

PLQ 3.3 Surface preparation of stainless steel surfaces

Oil and grease contamination shall be removed by:

- Steam-cleaning
- An emulsifiable or aqueous detergent, or
- An alkaline cleaning solution.

Stainless steel surfaces shall be blast-cleaned with stainless steel grit or non-metallic abrasive. The use of steel shot and steel or cast-iron grit is strictly prohibited.

The grade of cleanliness shall be at least Sa 2½.

Surface profile shall be in the range of 30 to 50 µm.

Where blasting is impractical, the surface shall be roughened manually with abrasive paper grade 220, disc grinders or flapper wheel abrasive pads. In all instances, clean, uncontaminated equipment must be used.

Dust and debris shall be removed by vacuum-cleaning.

PLQ 4 HOT-DIP GALVANIZING

Unless otherwise specified, steel pipes up to 150 mm dia shall be hot-dipped galvanized. Hot-dip galvanizing to be in accordance with SABS 763 – 1988 except that minimum thickness shall be 55 micron. Cut ends and small damaged areas shall be repaired by the application of a zinc-rich epoxy (single pack) to SABS 763 (ZINC GALV 1 – Dulux or POLY GALV – Plascon).

Only heavy-duty galvanising will be approved and all items to be provided with a SABS approval certificate.

PLQ 5 EPOXY PAINTS

Epoxy paint shall comply to SABS 1217.

The following will be applicable where epoxy paint is specified:

- Lining of pipes with nominal diameter larger than 500 mm and standard pipe lengths of 9,144 m, 12,192 m and 18,288 m:

Solvent free epoxy such as Sigmaline 523, with a minimum dry film thickness of 300 micron and a maximum dry film thickness of 500 micron.

- Lining and coating if all other pipes, specials and fittings, except where multi-purpose epoxy coating is specified:

Solvent base epoxy such as Carboline 891 and Sigmaguard EHB, with a minimum dry film thickness of 300 micron.

Epoxy paint and the repair kit for the repair of epoxy shall be from the same manufacturer.

Edges with epoxy paint shall have a radius of 3mm or 50 % of the pipe wall thickness (smaller of two).

Where another type of coating is specified, epoxy paint lining shall continue around pipe edge for each of the following:

- Flanged end

Onto both flange faces, extending for 50mm (min) onto pipe outer wall beyond flange.

- Ends suitable for straight or stepped couplings or flange adapters

Onto pipe outer wall for 250mm (min) from pipe end.

- Ends suitable for flange adapters, incorporating a restraining flange

Onto pipe outer wall from pipe end, up to and including both faces of the restraining flange as well as 50mm (min) beyond the restraining flange.

At joints between epoxy paint and cement mortar lining, the epoxy paint shall continue to 25mm underneath the cement mortar.

The following specification shall be applicable to pipes, specials and fittings to be welded on site:

- In the factory:

Abrasive blast cleaning of complete steel surface to SA 2,5 of ISO 8501-1. Apply epoxy paint to 100mm from pipe end.

- On site after welding of joint:

Prepare surface with sand paper or wire brush to St 3 of ISO 8501-1 to produce a white metal surface.

Apply epoxy repair kit from to same manufacturer as the factory applied epoxy.

The area applied on site shall be tested for pinholes and thickness.

PLQ 6 UV-RESISTANT MULTI-PURPOSE EPOXY PAINT

Multi-purpose epoxy shall be of the high build, modified aluminium epoxy mastic type, containing at least 90% solids.

PLQ 7 RE-COATABLE POLYURETHANE

The area to be over-coated shall be abraded with abrasive paper grade 220 to a uniform matt finish.

The surface shall be vacuum-cleaned to remove dust and debris.

Over-coat with a 40 µm minimum layer of Re-coatable Polyurethane in accordance with the Employer's colour code.

PLQ 8 FUSION BONDED, MEDIUM DENSITY, POLYETHYLENE COATINGS (MDPE)

An uniform MDPE coating must be obtained by dipping the already prepared and heated pipe into a fluidified bed of MDPE powder which then fuses directly on to the heated surface.

A coating thickness of between 1,8 mm to 2,3 mm depending on the outside diameter (OD) of the pipe and the service for which it is required must be obtained with the coating extending around the ends of the pipe to underlap the concrete lining for Sinta Joint pipes by a minimum of 25 mm.

- OD < 508mm : coating thickness = 1,8mm
- 508 mm ≤ OD ≤ 762mm : coating thickness = 2,0mm
- OD > 762mm : coating thickness = 2,3mm

Fusion bonded MDPE coatings shall comply to AS 4321 and must meet the applicable SABS requirements for this type of pipe protection.

PLQ 9 JOINT COATING SYSTEM FOR MDPE

The unprotected area at welded joints shall be protected as follows:

- The cutback of the MDPE coating shall be 100mm from the pipe ends.
- Chip off weld scale and remove grease, then wire brush to remove all loose rust, burnt coating material and dirt to a Standard St 2 of ISO 8501.
- Chamfer any raised edges or steps in the existing coating and slightly roughen the coating for 100mm
- Apply Denso Butyl Primer
- Apply Denso Butyl Tape if the area is uneven and has to be profiled.
- Apply Denso S43 Tape innerwrap with a 55% overlap.
- Apply Denso R23 outerwrap with a 55% overlap.

Protective of the joints with the Raychem shrink sleeve system will only be allowed if approved in writing by the Engineer and will only be considered for pipe diameters smaller than 400mm.

Damaged areas on MDPE coatings shall be repaired in accordance with the specifications and guidelines of the coating manufacturer.

PLQ 10 DENSO HT PETROLATUM TAPE WRAPPING SYSTEM

Denso HT Petrolatum tape wrapping system shall be used for the wrapping of buried flange and flexible joints and buried galvanized and epoxy paint coated pipes.

PLQ 10.1 General

Chip off weld scale and remove grease, then wire brush to remove all loose rust, burnt bitumen/coal tar enamel and dirt to a Standard St 2 of SIS 055900 (Swedish Standard).

Chamfer any raised edges or steps in the existing coating.

Apply Denso Priming Solution.

Apply Denso HT Tape of appropriate width uniformly in a spiral fashion to give a 55% overlap on the pipe and for not less than 200 mm along the length of the intact factory coating.

Apply uniform tension to ensure the tape is smooth and free from wrinkles. Do not apply excessive tension that will stretch the tape nor insufficient or uneven tension that will give rise to air bubbles and wrinkles.

PLQ 10.2 Flexible couplings and flanges

Apply Denso Mastic so as to create a smooth profile suitable for over-wrapping. Wrap a suitable width of Denso HT Tape over the coupling. Ensure that there are not air voids under the tape. Apply a double layer of Denso Layflat polyethylene sheeting over the whole length of the repair and for 100mm beyond each end of the repair. Tape the ends of the Layflat with two complete turns of 100 mm wide adhesive Denso PVC tape to seal the ends.

Denso fabric backed mastic blanket can be used as an alternative for Denso HT Tape. After priming, pack potential air void areas such as under the bolts with Denso Mastic. Place the mastic Blanket in position and press it into all air voids. Start under the pipe and work upwards. Over wrap the Mastic Blanket with two layers of Denso Layflat sheeting and secure the ends with 100mm wide adhesive Denso PVC tape.

If the pipe runs through very wet soils it is recommended that Denso S105 Paste be used in preference to Denso Priming Solution, and the couplings be wrapped with Denso PVC Self Adhesive Tape using a 55% overlap in place of the Layflat Sheeting.

PLQ 10.3 Welded joints and straight pipe lengths

After completion of Denso HT Tape wrapping and approval by the Engineer, apply 0,3mm adhesive PVC outerwrap with 55% overlap over the whole length of the wrapping and for 100mm beyond each end.

PLQ 11 FIBRE REINFORCED BITUMEN COATING

Fibre reinforced bitumen coating specified shall be a 5mm thick double layer fibre reinforced bitumen as specified in SABS 1200L (Clause 3.9.2.2) and it has to comply with SABS 1130, 1137 and 1178 (Type CB6 or CA2) standard specifications (as amended).

The unprotected area at welded joints and repairs of damaged areas shall be protected with Denso Primer D plus Densotherm HD hot applied bitumen tape in accordance with the manufacturers specifications.

Repair work with bitumen will only be allowed if approved by the Engineer. The following specification will apply:

- The metal surface must be cleaned with thinners or white spirit.
- Apply cold bitumen primer (Sovakote 7094) and leave for half an hour to dry.
- Bitumen temperature not to exceed 260°C.
- Fibre glass ("Vivian Rigina") is required in the middle of the bitumen layer.

- Minimum thickness of bitumen is 5mm.
- Remove white wash on existing bitumen and chamfer the edge. New bitumen must overlap existing bitumen by at least 25mm.

Any pre-applied epoxy paint coating at pipe ends (flanged, to suit straight and stepped coupling, or to suit flange adaptors, with or without restraining flanges) may not be covered by the Bitumen coating, except for a 50mm overlap at Epoxy paint termination, but never onto flanges.

PLQ 12 ADDITIONAL EXTERNAL PROTECTION FOR PIPES CAST INTO CHAMBER WALLS

After the concrete has cured for 7 days, wire brush or scabble the exterior and interior surfaces of the wall to remove laitance. Dry brush to remove all loose powder.

Mix ABE Super Laykold and water (1:1 ratio) and apply as a primer to the concrete and the pipe surfaces. After 1 hour apply a thick coat of ABE Super Laykold to the concrete and the pipe and immediately embed 250mm wide ABE non-woven polyester membrane "SBP" into the Super Laykold. After 3 hours apply another coat of Super Laykold.

This additional protection is required on the inside and outside of chamber walls.

There must be no contact between the steel pipe and the chamber reinforcement.

PLQ 13 MEASUREMENT AND PAYMENT

Corrosion protection and painting shall not be measured separately. The price for corrosion protection and painting shall be deemed to be included in the price for the pipe, fitting or special.

PU : BUILDING WORK

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PU BUILDING WORK

PU 1 SCOPE

This section of the Specification deals specifically with all the building work associated with the Works.

Concrete work, steelwork, cladding, pipelaying, mechanical and electrical equipment, etc. forming part of or to be housed in a building erected in terms of this specification shall conform to the requirements of the relevant standardised or particular specifications referred to in the Project Specification.

PU 2 INTERPRETATIONS

The relevant SANS 1200 Standardised Specifications such as Site Clearance, Earthworks, Earthworks (Pipe Trenches), Concrete (Structural), Low Pressure Pipelines, Bedding (Pipes), Sewers and Stormwater drainage shall also apply to the work under this section.

PU 3 MATERIALS

All materials used for the Building Works shall, where such mark has been awarded for a specific type of material, bear the SANS mark.

PU 3.1 Brick and Plasterwork

PU 3.1.1 Cement

Cement shall conform to the requirements of SANS 1200 G-Concrete (structural)

PU 3.1.2 Sand

Sand or plaster and mortar shall comply with the requirements of SANS 1090, whereas the aggregates for normal and granolithic floor screeds shall comply with the requirements of BS 1199 and BS 1201 respectively.

PU 3.1.3 Water

Water shall conform to the requirements of SANS 1200 G-Concrete (structural).

PU 3.1.4 Cement Mortar

Unless otherwise described, cement mortar shall be composed of six parts by volume of sand to one part by volume of cement. The materials are to be mixed dry until the mixture is of a uniform colour and then clean water is to be added gradually through a fine hose and the mixture turned over until the ingredients are thoroughly incorporated.

Cement mortar must be mixed in small quantities and must be used within one hour of mixing, as the use of cement mortar that has commenced to set will not be permitted.

PU 3.1.5 Plaster

Plaster on brick walls shall be mixed one part cement to six parts sand.

Plaster on concrete ceilings, beams, columns etc. shall be mixed one part cement to three parts sand.

Plaster shall be mixed as specified in Clause PU 3.1.4

PU 3.1.6 Bricks

Bricks shall be of the best quality sound hard burnt pressed bricks or in the absence of clay bricks, concrete bricks, even in size and shape and equal to a sample submitted to and approved by the Engineer prior to commencement of work.

Clay bricks shall conform with the requirements of SANS 227 and concrete bricks to SANS 987.

PU 3.1.7 Wall Ties

Wall ties shall be the galvanised, crimped, single-wire type with a 3,5 mm diameter, and shall comply with the requirements of SANS 28.

PU 3.1.8 Damp Proof Courses

Damp proof courses, unless otherwise described, shall be an asphaltic damp proof course with a base of fibre felt, and complying with the requirements of SANS 248 Horizontal Damp Proof Courses, and with a mass of 3,25 kg/m² or a plastic damp proof course of 15 micron thickness as Type B, complying with the requirements of SANS952.

PU 3.2 Fascias, Barge Boards and Window Sills

PU 3.2.1 Fascias and Barge Boards

Asbestos cement fascias and barge boards, where specified, shall be 12 mm pressed sheets, 200 or 225 mm wide, free from cracks, twists, blemishes or other defects and complying with the requirements of SANS 685.

PU 3.2.2 Window Sills

Internal fibre reinforced cement sills (NUTEC) shall be single lengths cut between reveals, fitted with fixing lugs and solidly bedded in 3:1 cement mortar with a slight projection beyond the finished wall face below. Sills shall be pressed reinforced cement of approved manufacture 152 x 15 mm thick set level.

PU 3.3 Paintwork

PU 3.3.1 Primers

Plastered surfaces must be cleaned down and have one coat alkali resisting primer of an approved brand applied in strict accordance with the manufacturer's instructions, before any undercoats are applied.

Galvanised metal surfaces must be treated with one coat Metal Etch Primer complying with the requirements of SANS 723.

Steel surfaces and doors and steel door frames, before being built in, must have all loose primer together with all rust spots, dirt, etc. removed and be treated with one coat red oxide zinc chromate primer complying with the requirements of SANS 909.

Wood surfaces to receive paint finish must be cleaned down, all knots treated with knotting and be primed with Type 1 Wood Primer externally and Type III Wood Primer internally, both complying with the requirements of SANS 678.

PU 3.3.2 Emulsion paint for interior use must be Grade I Emulsion paint complying with the requirements of SANS 663. Emulsion paint for exterior use must be of the Synthetic Polymer Base Type complying with the requirements of SANS 634.

PU 3.3.3 High Gloss Enamel Paint shall be used on all surfaces other than specified above. High Gloss enamel paint must be Grade I paint complying with the requirements of SANS 630 for decorative High Gloss Enamel Paints with a Non-Aqueous Solvent Base, for interior and exterior use.

Undercoats for paints, except Emulsion paints, must be Type I undercoat Paint complying with the requirements of SANS 681.

PU 3.4 Doors, Windows and Glazing

PU 3.4.1 Solid Hardwood Doors

Unless indicated otherwise on the drawings, all doors shall be solid hardwood doors, manufactured from hardwood complying to SANS 1099.

PU 3.4.2 Wooden Door Frames

All wooden door frames shall be of solid hardwood, complying to SANS 1099. Frames shall be fitted with suitable tie bars and braces at bottom and lugs for building in, three to each jamb of frames without fanlights and four to each jamb of frames with fanlights. All doors shall be provided with locks to the requirements of SANS 4 and each lock shall be provided with a duplicate key.

PU 3.4.3 Pressed Steel Door Frames

Pressed steel door frames shall comply with SANS 1129 and shall be manufactured from 1,6 mm thick mild-steel sheeting, pressed to the required shapes, properly mitred, welded and reinforced, with all welding neatly cleaned off.

Frames shall be of the widths required to suit the thickness of the walls into which they are built and shall be fitted with suitable tie bars and braces at the bottom. Three lugs to be built into the brickwork shall be provided on each jamb.

Rebates in frames and transom for doors shall be of the widths required to suit thicknesses of the doors and shall be fitted with a pair of approved steel butt hinges set flush into recesses in the frames. 4,5 mm thick reinforcing plates shall be welded to the backs of the frames at hinge positions.

PU 3.4.4 3CR12 Door Frames

The same conditions as specified in clause PU3.4.3 shall apply for 3CR12 Door Frames except that 1,6 mm thick 3CR12 sheetings shall be used.

PU 3.4.5 Windows

Steel windows must be of approved manufacture and design, constructed of rolled mild steel sections, properly mitred and welded at angles with welding cleaned off smooth on all faces and complying with the requirements of SANS 727. Window types and sized shall be as specified on the drawings.

PU 3.4.6 Aluminium Window Frames

Standard aluminium window frames shall be manufactured from aluminium extruded section with anodised finish.

PU 3.4.7 Winblock Window Systems

Precast concrete window systems shall be winblock window systems as supplied by Winblock Transvaal, Tel: (011) 444 6996/444 4887 or similar approved.

Standard Winblock surrounds shall be supplied as indicated on the drawings. The surrounds shall be manufactured from unreinforced low permeability, 30 MPa concrete and shall conform to the specification of Wintec in all respects.

Where direct glazing is specified, the glazing shall be fixed to the winblock surround in accordance with the instructions of the manufacturer.

Where opening windows are specified top-hung Winvents shall be supplied with factory glazing. The frame shall be manufactured from aluminium extruded sections with anodised finish. Weather seals the wool pile. Friction stays to be manufactured from stainless steel and handles from glass reinforced nylon (GRP)

PU 3.4.8 Fixed Louvre Windows

Fixed louvre windows shall be standard louvres to the sizes indicated on the drawings as manufactured by HH Robertson (Africa) Pty Ltd or similar approved and shall have a dark blue chromodek finish

Fixed louver windows shall be provided with a vermin proof screen manufactured from Mentis Type 362 Flatex screen as manufactured by Andrew. Mentis (Pty) Limited or similar approved welded to a 75 x 50 x 20 x 2,5 lipped angle frame, sized to fit into the wall opening as indicated on the drawings. The frame shall be provided with four lugs and fixed to the masonry work with four 8 mm x 50 mm expansion bolts.

PU 3.4.9 Glazing

Sheeting glass for glazing, unless otherwise specified, must be flat drawn clear glass of the thickness indicated below and comply to SABS 0400, Part N. For safety glazing refer to NN3.1.

For panes not exceeding 0,65 m ²	:	3 mm
For panes exceeding 0,65 m ² and not exceeding 1,5 m ²	:	4 mm
Where obscured glass is specified, 4 mm thick .		
Specific pattern glass shall be used.		

PU 3.5 Tiling

PU 3.5.1 Adhesive and Grouts

- (a) Wall adhesive
Wall adhesive shall be a grey, cement-based thin bed, wall tile powder adhesive for fixing tiles to walls.
- (b) Floor adhesive
Floor adhesive shall be a grey, cement-based thick bed, floor tile powder adhesive for fixing heavy tiles to floors or walls.
- (c) Bonding agent
Bonding agent shall be a latex modified for use with adhesives and grouts to improve water resistance.

PU 3.5.2 Tiles

Tiles shall be of first grade quality, white in colour, and of minimum thickness of 5 mm and shall be glazed ceramic tiles (unless specified to the contrary).

PU 3.6 Floor Finishes

PU 3.6.1 Vinyl Floor Tiles and Accessories

Vinyl floor tiles shall be semi-flexible vinyl floor tiles, 300 mm x 300 mm x 2,5 mm thick to the colours specified. The colour scheme shall be approved by the Engineer before any tiles are ordered - irrespective whether colours have already been specified on the drawings.

Skirtings shall match the colour of the floor tiles and shall reach 100 mm up against the wall.

PU 3.6.2 Epoxy Floor Coatings

PU 3.6.2.1 Self Levelling Coatings

Self levelling and self smoothing epoxy coatings shall be solvent free, epoxy overlay systems in general 4 – 6 mm thick. However the epoxy coating shall be applied to the thickness specified strictly in accordance with the manufacturers instructions. Before application the concrete shall be prepared and primed in accordance with the manufacturers instructions.

PU 3.7 Electrical Connection

Electrical wiring and fittings are to comply with the requirements laid down by :

- (i) The latest issue of the "Standard Regulations for wiring of premises" issued by the South African Institute of Electrical Engineers.
- (ii) The Factories, Machinery and Building Works Act of 1941.
- (iii) The local authorities By-laws and any special requirements of the Local Supply Authority.

PU 3.8 Sanitary Equipment

PU 3.8.1 Pedestal Water Closet Pans

Pedestal water closed pans shall be of wash-down type approximately 450 mm high, of white glazed fireclay or vitreous china, complying with the requirements of the relevant SANS specification.

Pans shall be bedded on the floors in 3:1 cement mortar. Pans shall be fitted with approved wooden seats with double flap of size and shape required to fit the pans and each attached to pan with two non-ferrous metal fixing bolts.

PU 3.8.2 Flushing Cisterns

Closed coupled vitreous china cisterns, no less than 12 mm thick in any part, shall be provided complying with the relevant SANS specification and shall have a capacity of not more than 9 litres and shall be of the valveless symphonic type of approved manufacture.

PU 3.8.3 Hand Wash Basins

Hand wash basins shall be of the bracket type of white vitreous china, complying with the requirements of the relevant SANS specification and having overflow, fitted with chromium plated grid.

Unless otherwise specified, basins shall be size 585 x 430 mm each fitted with 38 mm plug and chromium-plated chain, and with 12 mm chromium-plated brass easy clean pattern screw down pillar taps.

Basins shall be fixed on concealed wall hangers fixed to walls with 6mm brass bolts, 150 mm long.

PU 4 PLANT

Plant, equipment, tools, scaffolding, etc. utilised in building work shall be of suitable capacity, condition and design to ensure the satisfactory and timeous completion of the Works within the specified period and in terms of these specifications and good building practices.

Only registered artisans (e.g. plumbers, electricians, etc) shall be employed on any work where this is compulsory building practice.

PU 5 CONSTRUCTION

PU 5.1.1 Normal Brick Walls

Brickwork, wherever practicable, and not otherwise described must be built in Stretcher bond. Half brick walls, walls in two skins and cavity walls must have separate skins built in stretcher bond. No false headers are to be used and none but whole bricks except where legitimately required to form bond. The bricks are to be well wetted (saturated in hot weather) with water before being laid and the course of bricks last laid is to be well wetted before bedding fresh bricks upon it. All perpend and angles are to be kept plumb. The brickwork is to have the joints flushed up at every course solid throughout the whole width of the course, and each course is to be laid on a solid bed of mortar. Pointing is to be done as the work proceeds.

The joints of all walls to be plastered or tiled are to be raked out 15 mm as the work proceeds to form a key for plaster or screed. All walls are to be built up in regular and horizontal courses and carried out so that no part built is more than 1,2 m higher than any adjoining walls. Mortar beds generally are not to exceed 12 mm thickness.

PU 5.1.2 Face Brick Walls

In all face brickwork the bond must be set out on the first level course of brickwork, at floor level internally and two courses below ground level externally. The bond, if necessary, is to be broken in the centre of panels under windows or to piers between windows. All perpend must be kept true and all courses must be built to gauge rods. Facings must be carefully protected from damage, mortar droppings, paint splashes, etc. during the whole period of the Contract, and facing on completion will not be allowed.

PU 5.1.3 Cavity Walls

Cavity walls are to be built with two brick skins with a cavity between the skins and the two skins tied together with wire ties, four to the metre square, carefully laid and in no case to fall inwards towards the inner skin of the wall.

Care must be taken to keep the cavity free of mortar droppings or other matter by movable boards or other means, and temporary openings must be left at plinth level through which any such droppings, etc. can be removed, and the openings made good on completion.

At door, windows and other openings, the cavities shall be stopped 102,5 mm back from heads, jambs and sills of openings.

PU 5.1.4 Reinforced Brick Lintols

Brick lintols are to be built of normal, sound, well burnt, good quality building bricks, similar to the facings where exposed properly bonded longitudinally and bedded and pointed in cement mortar as described. Special care must be taken to ensure solid bedding, particularly where the reinforcement occurs.

The lintols are to be reinforced with straight continuous mild steel rods of the size and number scheduled. The rods must each extend 300 mm on each side of the opening and are to be evenly spaced across its thickness in the first horizontal joint above the soffit.

Brick lintols in cavity walls must have all rods placed below the solid sections of the walls, excepting for those specifically scheduled to occur below the cavity.

Cavity walls must be built solid for the number of courses scheduled above the lintols soffit. This solid section must extend the full width of the opening, plus 300 mm on each side. Combined brick and concrete lintols may have the reinforcement divided proportionately between brick and the concrete skins. Where two or more openings are less than 600 mm apart, the lintol shall be continuous over all such opening and such openings and dividing piers, plus 300 mm bearing at each extreme end as before, shall have such height and reinforcement as scheduled for widest opening spanned.

Span in mm	Min Height of Lintols above soffit course, in brick courses	Reinforcement per half-brick thickness of wall above for solid walls		Additional reinforcement for cavity, placed below cavity	
		No of rods	Dia mm	No of rods	Dia mm
600	2	1	6	1	6
900	3	2	6	2	6
1200	3	3	6	1	6
1500-1800	4	2	10	1	10
2100-2400	5	3	10	1	10

PU 5.1.5 Damp Proof Courses

The sheeting is to be cut into strips of the required width and laid on all foundation walls to the full thickness of the walls and without any longitudinal joints. At ends, angles and intersections the sheeting must be lapped 150 mm and sealed. In cavity walls the sheeting must be laid across the full width of the wall, including the cavity, and must be stepped up one course in the cavity, over a cement triangular fillet, so that the sheeting under the inner skin of the wall is higher than that under the outer skin of the wall.

Under all window sills exposed to the weather, the sheeting must be laid on the brickwork in the first joint immediately below the sill and turned up with an easy bend and tucked into window frame.

Over reinforced brick lintols exposed to the weather, the sheeting must be laid to form damp proof course as detailed above for solid walls and cavity walls.

PU 5.1.6 Reinforcing in Brick Walls

Reinforcing (brickforce) of an approved manufacture shall be placed on every fifth course in all brick walls. In halfbrick and cavity walls 80 mm wide reinforcing mesh shall be used and 150 mm wide mesh in the case of the one-brick walls.

Except where otherwise described, all external plaster is to be finished with a wooden float and all internal plaster is to be finished with steel trowel, all to perfectly true and even surfaces, free from tool marks and other defects on completion.

All finished surfaces are to be protected from injury. All joints in brickwork are to be well raked out all surfaces, brickwork and concrete, to be plastered must be brushed down to remove all dirt and dust and be thoroughly wetted directly before plastering. Concrete surfaces must be roughened or hacked as necessary to give a proper key for plaster. The surfaces must then be sloshed with a course cement grout before plastering commenced. Plaster must be returned into reveals and soffit of openings and all angles and edges must be true and straight. All plaster surfaces must be free from blemish and any cracks, blisters, or other defects must be cut out and made good and the whole left perfect at completion. Plaster on walls must not be less than 12 mm or more than 20 mm in thickness, and plaster on concrete work must be not less than 10 mm or more than 15 mm in thickness, except where specifically otherwise described.

PU 5.1.8 Slip Joints

Slip joints shall be provided between brickwork and concrete slabs and beams by levelling up and steel trowelling smooth the bearing surfaces of brickwork with 3:1 mortar and covering the bearing surface before concrete is cast with 2 layers of 500 µm (five hundred micron) black general purpose sheeting membrane.

The ends and sides of beams and edges of concrete slabs shall be separated from the brickwork with 12 mm polystyrene placed vertically against the brickwork before the concrete is cast.

PU 5.1.9 Beam Filling

Unless otherwise specified, beam filling shall be half brick, built in cement mortar, cut in between roof timbers and carried hard up to underside of roof covering and flushed up in mortar with a groove formed between covering and mortar to the satisfaction of the Engineer.

PU 5.1.10 Securing of Roofs

Roof plates shall be fixed to walls with bands of 1,6 mm thick galvanised hoop iron, 32 mm wide, built six (6) courses deep into brickwork or embedded 300 mm deep into concrete, and not exceeding 1,5 metre centres, and well lapped and spiked to plates and to roof trusses where adjacent, otherwise taken up to and lapped round the nearest purlin and well spiked thereto. A layer of brickforce shall be provided at each alternate course above the building in of the hoop iron to fix the roofs.

PU 5.2 Rain-Water Goods

All gutters, downpipes and flashings shall be 0,6 mm thick galvanised sheet iron. Rates for sheet iron eaves gutter and rainwater pipes shall include for short lengths and for lapped, riveted and soldered joints. Eaves gutters are to be screwed or welded to fascia boards or roof timbers;/beams with 38 X 3 mm galvanised steel gutter brackets at approximately 900 mm centres, or as otherwise described. Rainwater pipes are to be fixed with sheet iron ears to and including 25 C 76 X 150 mm wrought and chamfered hardwood blocks, plugged to brickwork or concrete and oiled, or with 38 X 14 gauge galvanised hoop iron straps built into walls not more than 2 metres apart, bent around pipe and bolted at back.

Flashings shall be properly cut, lapped and shaped to render a waterproof finish. Flashings turned up against walls must be finished with cover flashings bent to shape, dressed over the underflashing and with top edge wedged into joint of brickwork and pointed or secured by other approved means.

Fibre-cement fascias and barge boards shall be secured with screws or bolts. Where joints occur in the length they are to be covered with two channels 40 mm girth with web to suit thickness of plates formed from 0,5 mm thick galvanised sheet iron cut to shape, bent as required and with the webs riveted together back to back. Tongues 15 mm wide by 15 mm long must be left projecting at both ends of flanges and clamped down over edges of fascias or barge board when in position.

PU 5.3 Paintwork

All surfaces not being painted, such as face brickwork, sills, floors and stained woodwork, must be covered up and protected against paint and distemper spots before any painting is commenced. All floors must be swept clean and walls dusted down before any paintwork is commenced and no sweeping or dusting must be done while painting is in progress.

All plastered wall; ceiling and similar surfaces must be perfectly dry and in a fit state to receive the finishings, before the work is put in hand.

All coats of paints, etc must be thoroughly dry before subsequent coats are applied, and rubbed down where necessary.

All work must be finished to colours approved by the Engineer.

The tints of undercoats must approximate those of the finishing colour and in order to indicate the number of coats applied and to avoid misses when applying a succeeding coat a slight difference shall be made in the tint of each coat.

The Contractor must provide all necessary dust sheets, covers, etc and shall exercise all necessary care to prevent marking the surfaces of joinery, walls, floors, glass and electrical fitting, etc. and must keep all parts of the works perfectly clean and free at all times from spotting, accumulation of rubbish, debris or dirt arising from the painting operations. Any surface disfigured or otherwise damaged must be completely renovated or replaced as necessary, by the Contractor at his own expense. The premises must be left clean and fit for occupation at the completion of the Work.

PU 5.4 Floor Finishes

Where a floated concrete floor finish is specified on the drawings, the requirements of SANS 1200G or GA whichever is relevant shall apply.

Granolithic finish to floors, treads and risers of steps, thresholds, landing etc. must be composed of two parts hard stone chippings : half part sand and one part cement, steel trowelled to a true and even surface. The granolithic must be laid before the concrete surface bed has matured, otherwise the surface of the concrete must thoroughly cleaned with a wire brush and a coat of neat cement grout applied immediately before the granolithic is laid. The granolithic must be laid in panes not exceeding 6 m² in areas, and jointed to lines of panels and lined into smaller square as directed with sunk V-joint. The joints between the panels should coincide with joints in the concrete surface bed, where these occur. No dusting on of colouring pigment will be allowed.

Vinyl floor tiles shall be fixed on to a screed of thickness at least 25 mm. The screed shall have a wood floated finish and shall be smooth with no obstruction greater than 3 mm protruding and with the screed surface level in such a way that no gap greater than 5 mm would show underneath a 3 m straight-edge or part thereof.

Vinyl tile adhesive shall carry the same product name as the vinyl tiles and adhesives shall be applied as stipulated by the supplier.

The acceptable tolerance of the final tiled floor shall be similar to the specified for the screed surface underlying the tiles.

PU 5.5 Tiling Work

The area to be tiled, shall first be plastered as described under plasterwork leaving a wood float finish. The plastered surface shall be left for two weeks to cure before any tiling may start.

Tiles shall only be cut by approved tungsten tile cutters, or for irregular shapes by approved tile saws. The use of nibblers shall not be permitted.

A tiled panel shall be planned beforehand to minimise cuts. An initial perpendicular tiling configuration shall be laid against perpendicular fixed battens. A clear space of 1 to 2 mm shall be left between tiles by inserting positive temporary spacers.

Prior to the application of any adhesive the rendering shall be vacuum cleaned. Adhesive shall be mixed with a bonding agent and not with water. The mixing proportions shall be as specified by the supplier. Adhesives shall be applied within a 15 minute period after mixing, with those adhesives not used during such time to be thrown away.

Adhesives shall be applied in a solid bed, some 6 mm thick and then struck with an approved serrated steel trowel. Adhesives shall not be applied by "the fire point tiling method".

Grouting of the joints shall only start 48 hours after tiled section has been completed. The grout shall also be mixed with the bonding agent as specified by the supplier. The grout shall be worked off leaving a neat superficial rut in the joint centre. All tile faces shall be cleaned directly after grouting.

No tiling shall be done over a structural joint. In large tiled panels, a movement joint shall be left every 3 meters in the horizontal and vertical direction as detailed. At a structural joint (contraction or expansion joint) the rendering, adhesives and tiles shall be interrupted over the joint and the joint sealed at the surface.

The permissible deviation on the final surface shall be a maximum gap of 3 mm measured under a 3 m straight edge or part thereof.

PU 6 TOLERANCES

Where tolerances are not specified in the clauses above those generally accepted at representing good workmanship in the building trades shall apply.

PU 7 TESTING

The Engineer reserves the right to order any tests, whether at place of manufacture or on site, necessary to evaluate the quality of the work and to ensure the finished building conforms to all the specified requirements.

PU 8 MEASUREMENT AND PAYMENT

PU 8.1 Schedule items

PU 8.1.1 Brickwork

Brickwork, if measured as a separate item, shall be measured in square metre of the nett brick walled area (with the wall width and type of brick-finish, indicated). No additions will be made for small openings such as air bricks, etc. The tendered price square metre of brickwork shall include for the following, if such items are not listed separately:

- (a) Plasterwork as indicated
- (b) Damp proofing
- (c) Brick forcing (every fifth layer)
- (d) Reinforcing of lintols
- (e) Miscellaneous items built into brickwork shown on the drawings such as air bricks.

PU 8.1.2 Wall, Ceiling, Roof and Floor Finishes

Cement plaster on walls and ceilings, roof screeds, floor screeds, paint and any other finish described or specified, shall if measured as a separate item, be measured in square metres of the nett surface area. No deductions shall be made for small openings nor shall additions be made for small protrusions and reveals. No separate payment shall be made for the processes involved and material supplied for the complete painting of all fixtures and fittings, as specified herein and the costs hereof shall be included in the tendered price for the supply, manufacturing and erection of all such items to be erected.

PU 8.1.3 Miscellaneous

- (a) Doors and windows shall be measured per unit of door or window complete with door frame, lock keys, glazing, painting, etc. for each type and size of door or window or as a lump sum payment for all doors and windows included in the door and window schedule of the Works.
- (b) Other items of building work, fixtures and fittings, shall be measured and paid for in the units of the measurement listed in the Schedule of Quantities.

PUA : PAINTING

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PUA PAINTING

PUA 1 SCOPE

This section covers the preparation of surfaces, painting, and materials for the decoration and protection of metal, concrete, wood and other surfaces which are exposed to non-corrosive or mildly corrosive conditions only.

Where surfaces which are exposed to severe conditions are to be protected, the painting systems, the factory's quality-control measures, any supervisory measures, and other appropriate information will be specified in the Project Specifications.

PUA 2 GENERAL

No paint shall be applied to any surface containing traces of dust, grit, grease, oil, loose rust, mill scale or corrosion products of any kind or to any surface that is not free from moisture. Where necessary, surfaces shall be thoroughly washed to remove all traces of soluble salts and/or corrosive air-borne contaminants prior to painting, and the surfaces shall be dried and painted immediately thereafter.

Welding shall be completed in so far as it is possible before painting commences, but in cases where welding can be done only at a later stage, no paint shall be applied to within 75 mm of the proposed weld position unless otherwise specified. Welds and adjacent parent metal shall be abrasive blasted and/or ground and all contaminants such as flux shall be removed prior to painting.

Surfaces of members which are to rest on concrete or other floors or which will be otherwise inaccessible after erection shall receive the full paint system prior to erection.

Damaged paint areas on metal surfaces shall be cleaned, rust spots removed where applicable and the surrounding paint which is still intact shall be feathered for a distance of 20 mm beyond the damaged area. Spot priming and repair shall consist of all the coats previously applied and shall overlap the damaged area.

Damaged galvanised areas shall be cleaned and any rust spots and any flakes of the coating surrounding the damaged area removed. The coating shall then be restored by zinc spraying or soldering, or painting with a zinc-rich paint, as may be approved by the Engineer.

Where the shop coat is allowed to age for a few months before the final painting is done, light sanding or rubbing with steel wool or scrubbing with clean water using a bristle brush shall be carried out.

Steel to be embedded in concrete shall not be painted below 50 mm from the final level of the concrete.

Each priming coat and each undercoat of paint shall be inspected and approved by the Engineer before any subsequent undercoat or finishing coat is applied.

All finishing colours shall be as specified in the Project Specifications, as shown on the Drawings, or as directed by the Engineer.

PUA 3 MATERIALS

Paints shall comply with the requirements of the appropriate specifications below:

PUA 3.1 Primers

SANS 312: Red-lead based for structural steel
SANS 678: For wood
SANS 679: Zinc chromate for steel
SANS 723: Etch-wash primer for metals
SANS 912: Calcium plumbate for galvanised iron
SANS 926: Zinc-rich epoxy for steel

PUA 3.2 Undercoats

SANS 681: For all undercoats

PUA 3.3 Finishing coats

SANS 515: For interior use, flat and eggshell finish
SANS 630: For interior and exterior use, high-gloss enamel
SANS 631: For interior and exterior use, oil gloss paint
SANS 633: For interior use, emulsion paint
SANS 634: For exterior use, emulsion paint
SANS 684: For exterior use on structural steel
SANS 801: For interior and exterior use, epoxy-tar paint
SANS 802: For interior and exterior use, bituminous aluminium paint
SANS 887: For interior use, glossy and egg-shell varnish

The Contractor shall furnish the Engineer with the following information and details regarding the paints and decorative materials for the painting system he proposes to use, for written approval:

- i) The name of the manufacturer and trade name.
- ii) The brand, type or grade of paint and the appropriate SANS Specification.
- iii) Manufacturer's data sheets, colour references, instructions for use, including surface preparation, sealers, primers, undercoats, finishing coats, coat thicknesses and curing periods, which shall all be considered as being part of these Specifications if approved by the Engineer.
- iv) Safeguards to protect the applied paint from damage until the work is accepted by the Engineer.
- v) The shelf or pot life of materials, if applicable.
- vi) An undertaking that the proposed paint system is suitable for its intended use and that the various coats of paint are compatible with one another.

Where proprietary brands are used, the manufacturer's priming and all subsequent coats of paint suitable for that particular brand shall be employed in accordance with the manufacturer's instructions.

No other materials of a similar nature and quality or from another manufacturer may be used instead of those approved unless permission to do so has been obtained from the Engineer, in writing.

All materials shall be brought onto the Site in containers sealed by the manufacturer. Paints shall not be mixed with another paint of a different quality, type, brand or colour, or thinned or adulterated in any way, but shall be used as supplied by the manufacturer. Any mixing or tinting required shall be carried out by the manufacturer. Tinting of paint on the Site by the Contractor will only be allowed with the written permission of the manufacturer and the Engineer.

PUA 4 INSPECTION AND PRELIMINARY WORK

Before commencing paintwork, the Contractor shall carefully inspect the surfaces to be painted to satisfy himself that the surfaces are in a satisfactory or acceptable condition to receive the paint system specified.

All metal fittings and fastenings shall be removed where applicable before the preparatory processes are commenced. On completion, the metal fittings and fastenings shall be cleaned and refitted in position.

PUA 5 WORKMANSHIP AND FINISHES

Paint may be applied by spray, brush or roller depending on the materials used, the surface to be painted, and the manufacturer's instructions.

Every coat of paint, irrespective of the method of application, shall be adequately and permanently keyed or bonded to the base material or previously applied coat, and shall be evenly distributed, continuous, free from sags, runs, brush marks, pin holes or other imperfections, and shall dry to a smooth finish.

An approved water trap and air-regulating valve shall be furnished and installed on all equipment used in spray painting.

Before painting the interiors of buildings they shall be cleaned and the floors shall be washed and kept free from dust during the progress of the interior work.

The Contractor shall protect all nearby surfaces against disfigurement by spatters, splashes and smirches of paint or paint materials. The Contractor shall be responsible for any damage by paint or dirt caused by his operations to vehicles or property or injury to persons and he will be required to provide protective measures to prevent any such damage or injury and make good, where required, at his own expense.

If passing traffic creates dust which may harm or spoil the appearance of external painted surfaces, the Contractor shall sprinkle the adjacent areas with water, at his own cost, for a sufficient distance on each side of the location where painting is being done.

Undercoats shall be tinted by the manufacturer to distinguish between successive coats.

The final coats or finishing coats of paint shall be applied after all the other work in the vicinity has been completed.

The painter shall keep some of the final paint in reserve in the event of his having to make good any patching which may be required as a result of damage or unforeseen circumstances.

Upon completion, the Contractor shall, in the case of buildings, clean all glass, remove all paint spots from walls, floors and fittings, and leave the premises clean and fit for occupation.

All inflammable materials, comprising solvents, thinners, wiping cloths, etc, shall be placed in tightly closed containers and properly disposed of.

PUA 6 PAINTING OF PLASTER, CONCRETE OR BRICK SURFACES

PUA 6.1 Surface Preparation

Surfaces for painting shall be prepared by sandpapering scraping or wire brushing to remove loose material, dust, laitance, scum or other deleterious materials or high spots. Defective areas shall be cut out where necessary and made good with an approved non-shrink filler. Cracks shall be cut out, suitably keyed, and given a coat of an approved bonding agent before the filler is applied. All patches shall be rubbed down to an even surface. Surfaces shall be washed and allowed to dry.

Surfaces shall be treated with neutralising liquid for walls, and if the surface is coarse or textured, either one full coat of pigmented wall sealer or one full filler coat shall be applied in addition to the neutralising liquid.

PUA 6.2 Paint Application

Prior to the emulsion paint being applied, the surface shall be sealed with an approved clear sealer and primed with an undercoat diluted to 50%. Emulsion paint (PVA or acrylic) shall then be applied in two finishing coats.

Egg-shell finish (alkyd oil based), oil gloss paint or enamel glass paint shall be applied as follows: one coat of universal undercoat shall be applied and it shall be followed by one coat of a mixture comprising 50% of the undercoat and 50% of the paint to be used for the finishing coat. A finishing coat of semi-gloss eggshell, or oil gloss paint or enamel gloss paint shall then be applied.

PUA 7 PAINTING OF WOODWORK

PUA 7.1 Surface Preparation

The surfaces shall be cleaned, sandpapered and rubbed down to a smooth, even face before painting. The moisture content of the timber shall not be more than 20% at the time when the first coat is applied. All cracks, shakes or scars shall be filled flush with a filler approved by the Engineer before painting. The surface shall then be washed with cleaner and allowed to dry.

PUA 7.2 Primer Application

One coat of an approved wood primer shall be applied.

After open-grained timber has been prepared and primed, the grain shall be stopped and filled with synthetic filler and rubber down with water paper.

All new woodwork shall be properly primed on all surfaces and edges before being fixed in position. All woodwork not previously painted shall be given a prime coat, well brushed in.

PUA 7.3 Paint Application

One coat of universal undercoat shall be applied followed by one coat of mixture comprising 50% of the undercoat and 50% of the paint to be used for the finishing coat. A finishing coat of oil gloss paint or enamel gloss paint or semi-gloss eggshell (alkyd oil based) paint shall then be applied.

PUA 7.4 Varnish Finish

Prepare, stop and apply two coats of gloss varnish or eggshell varnish.

PUA 8 PAINTING OF METAL SURFACES

PUA 8.1 General

Wherever possible, all painting shall be done at the fabricator's works, but where this is not feasible, the Engineer may permit the application of the undercoat and finishing coats to be carried out on the Site, in which case a prime coat shall be applied at the fabricator's works prior to the members being despatched to the Works.

PUA 8.2 Surface Preparation

The preparation of metal surfaces shall comply with SANS Code of Practice 064 and shall receive the greatest care to ensure rust-free conditions prior to the paint system being applied.

All surfaces shall be prepared by loose paint, rust, plaster, scale, dust, dirt, grease, etc, being removed and by the defective paint surfaces repaired or patched before painting or repainting. Damaged shop-primed surfaces shall be e thoroughly cleaned of rust and patched with a prime coat.

PUA 8.3 Paint Application

a) Iron and steel work

All iron and steel work shall be properly primed with a red-lead-based primer where steel work is likely to be exposed to the elements for longer than 30 days. Zinc-chromate primer may be used where overpainting will be completed within 30 days of priming. Metal-etch wash primers may be used under dry conditions where overpainting will be completed within 24 hours of priming. The dry-film thickness of the prime coat shall not be less than 0,030 mm.

After priming, one coat of universal undercoat shall be applied. If necessary, the undercoat shall be tinted to a shade just lighter than the desired finish with approved liquid stainers. The dry-film thickness shall not be less than 0,025 mm.

The two finishing coats shall either be of alkyd resin-based synthetic enamel, gloss or matt oil paint, or as specified elsewhere. The dry-film thickness shall not be less than 0,025 mm per coat.

When mating surfaces are brought together, both surfaces shall have been given the full treatment specified, but where this cannot be done, each surface shall be given a copious coating of primer and the surfaces drawn together while the paint is still wet.

The portion of structural steel members to be buried in soil, and all bases to a height of 500 mm shall be given two coats of an epoxy-tar primer instead of the zinc-chromate primer specified for other surfaces.

Ungalvanised guard-rails shall receive two coats of zinc-chromate primer with a dry-film thickness of 0,020 mm per coat before being despatched to the Site.

Before the first finishing coat is applied, the guard-rails shall be thoroughly washed down to remove all traces of salt and other airborne corrosive materials and dirt or other contaminants.

As soon as the rinsed guard-rails are dry, a finishing coat of high-gloss enamel shall be applied to a dry-film thickness of not less than 0,025 mm. This shall be followed by a second coat, as before within 48 hours.

The guard-rails shall preferably be given both finishing coats before erection, but where this cannot be done, the Engineer may allow the finishing coats to be applied after erection, provided that all the mating surfaces and inaccessible spots be painted with the finishing coats before erection.

The total dry-film thickness of all the coats of paint on guard-rails shall not be less than 0,090 mm.

The surfaces of steel and cast-iron articles, such as floor gratings, grids and manhole covers, shall, after a thorough brushing to remove loose rust, be painted with two coats of epoxy-tar paint, each at least 0,023 mm thick.

b) Galvanised iron and steel

All traces of protective coating shall be removed with galvanised iron cleaner, and two coats of calcium plumbate primer shall be applied. One coat of tinted universal undercoat and two finishing coats of alkyd resin-based synthetic enamel gloss paint shall be applied.

c) Non-ferrous metals

Surfaces of aluminium, copper, etc, shall be prepared and cleaned, and one coat of self-etch zinc-chromate wash primer shall be applied. One coat of universal tinted undercoat and two finishing coats of enamel gloss paint shall then be applied. Where non-ferrous metals are not to be painted, the surfaces shall be cleaned, polished and two coats of lacquer applied.

PUA 9 PAINTING OF FLOOR SCREEDS

Where chemicals could cause damage to floors, such floors shall be painted with an approved epoxy paint. The type of paint to be used will be specified in the Project Specifications and will depend on the types of chemicals that are used.

The preparation of such floor screeds for painting and the subsequent application of paints shall be carried out strictly in accordance with the manufacturer's instructions.

PUA 10 PAINT THICKNESS

Unless otherwise specified, all coats of paint, whether prime coat, undercoat or finishing coat, shall have a dry-film thickness of not less than 0,200 mm, irrespective of the method of application.

PUA 11 INSPECTION

The Contractor shall provide the necessary equipment to establish whether the primers, undercoats and finishing coats have been applied to the correct thickness and at the correct applications. The Engineer may take samples of the paints during painting operations for testing and quality control.

PUA 12 MEASUREMENT AND PAYMENT

Unless otherwise specified in the Project Specifications or in other sections of these Specifications where painting is required, painting shall be measured in square meters.

C.3.5.8.3 PARTICULAR SPECIFICATIONS FOR PUMPSTATION

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PB **BUILDING WORK**

PB1 **SCOPE**

PB1.1 This specification covers the requirements for building work for Pumpstation and Guardhouse.

Provisional Sums have been provided for domestic electrical work forming part of this contract. Drawings and specifications will be provided by the Engineer where after the Contractor shall obtain tenders to enable the selection by the Engineer of a preferred electrical subcontractor. Structural Steel Work and Cladding and Sheeting are specified in SANS HA and HB respectively.

PB2 **INTERPRETATIONS**

PB2.1 **Supporting Specifications**

The following supporting specifications forming part of the contract have particular reference:

SANS 1200 : A
SANS 1200 : D
SANS 1200 : G
SANS 1200 : HA
SANS 1200 : HB

PB3 **MATERIALS**

PB3.1 **General**

Where there is a standardization mark programme for any material, all such material supplied shall bear the official standardization mark. Material shall be the best of their respective kinds. Only undamaged materials may be used in the Works. Where the term "approved" is used in connection with materials it shall mean that the materials shall be to the approval or choice of the Engineer.

PB3.2 **Samples**

Before placing orders for any materials the Contractor shall supply catalogues, selection charts, samples or whatsoever additional information is called for by the Engineer. Approved samples shall be carefully stored and protected on the site and shall serve as a measure for the acceptance or rejection of consignments of the material.

PB3.3 **Materials for building work**

PB3.3.1 Sand

Sand for the use in mortars and plasters shall be in accordance with CKS 84. The sand shall be washed if directed by the Engineer and shall be free from dust, soft particles, clay, loam, animal or vegetable matter or other deleterious impurities and equal to a sample to be submitted to and approved by the Engineer before dumping on site.

PB3.3.2 Cement

Cement shall be ordinary Portland cement complying with SANS EN 197.

PB3.3.3 Common Bricks

Common bricks shall be General Purpose clay bricks complying with SANS 227 as laid down in regulation 5. The degree of efflorescence not exceeding "Slight" and water absorption not exceeding 20% is acceptable.

PB3.3.4 Facing Bricks

Facing bricks shall comply with SANS 227 as laid down in regulation 5. The degree of efflorescence not exceeding "Slight" and water absorption not exceeding 12% is acceptable.

PB3.3.5 Quarry Tiles, etc.

Quarry, cement and similar tiles shall be of approved manufacture, even in shape and size, free from cracks, twists or blemishes and uniform in colour.

PB3.3.6 Hollow Clay Blocks

Hollow clay blocks shall comply with SANS 589.

PB3.3.7 Galvanized Wire Wall Ties

Galvanized wire wall ties shall be formed of 3,15mm diameter galvanized iron wire, bent and twisted to shape and shall comply with SANS 28.

For cavity wall the ties shall be of the "Butterfly" or "Modified PWD" type and for solid walls and linings of the "Single Wire" type.

PB3.3.8 Rainwater goods

Rainwater goods, i.e. gutters, down pipes, goosenecks, stop-ends, etc. shall be made from galvanized mild steel (GMS). Down pipes shall be of a circular shape, and gutters shall be D-shape, with minimum dimensions as shown on the drawings.

PB3.3.9 Damp proofing and Waterproofing

Damp proofing and waterproofing materials shall comply with the following specification requirements:

Bituminous damp proof courses to walls, sills etc – SANS 248 Type FV.

Polyethylene sheet in damp proof courses to walls, sills etc. – SANS 952 Type B.

Polyethylene sheet in damp proof to floors and basements – SANS 952 Type C.

Sealing compounds consisting of two components polysulphide base – SANS 110 – Type 2 Gun Grade.

Waterproofing to flat concrete roofs is to be laid by and approved firm of specialists under a ten year guarantee and shall be "Bituthene" or approved equal waterproofing membrane.

PB3.3.10 Timber, Processed Boards, etc.

Timber, laminated timber, processed boards, panels and sheets shall comply with the following specification requirements:

Softwood structural timber – SANS 1783-1 – Stress Grade 4

Softwood brading and battens – SANS 1783-4

Softwood shelving – SANS 1528-3

Softwood joinery timber – SANS 1349

Hardwood joinery timber – SANS 1460 – knotty grade

S.A. pine laminated timber – SANS 1089

Gypsum plasterboard – SANS 266

Gypsum cove cornice – SANS 622

Wood fibre building board – SANS 540

Wood wool panels (cement bonded) – SANS 637

Fibre cement sheets – SANS 685

Fibre cement cellulose sheets – SANS 803

Plywood and processed boards - SANS 929

Mild steel nails – SANS 820

S.A. Pine is to bear the relevant SANS mark and shall be ordered in the dimensions in which it will be used as no scantlings of marked timber will be allowed.

PB3.3.11 Doors

Framed and ledged batten doors and flush doors shall comply with CKS 153 and SANS 545 respectively. Flush doors shall have solid timber edge strips such that veneers cover the edges of the edge strip and only the outer face of the strip is visible and if the type of veneer is specified the edge strips shall be timber of the same species and of matching colour and grain. Double doors shall have rebated meeting stiles. Description of doors hung to steel frames shall be deemed to include for screws.

PB3.3.12 Locks

Mortice locks, mortice latches, mortice deadlocks and mortice lock furniture shall comply with SANS 4.

PB3.3.13 Glazed Ceramic Wall Tiles

Glazed ceramic wall tiles and fittings shall comply with SANS 22.

PB3.3.14 Pressed Steel Door Frames

Pressed steel door frames shall comply with SANS 1129. Frames shall project not less than 20mm into the floor finish. Before leaving the factory, frames shall be treated with one coat of red oxide zinc chromate primer complying with SANS 679. Frames for single doors shall be provided with one pair 100mm steel butt hinges and an adjustable striking plate for a mortice lock and frames for double doors shall be provided with two pairs 100mm steel butt hinges. Butt hinges shall be stout steel butts with loose pins, welded to frames. Where necessary mortar caps shall be welded to frames and back plates shall be welded on behind tapings for screws.

PB 3.3.15 Pressed Steel Cupboard Door Frames

Cupboard door frames shall be described in PB3.3.14, but with thresholds of uneven channel section, one pair 100mm steel butt hinges to hanging stiles at top above transoms and necessary striking plates for mortice locks and keeps for barrel bolts.

PB3.3.16 Combination Doors and Frames

Combination doors and frames shall be manufactured of 1,6mm thick steel plate. The frame shall be as described in PB3.3.14. The door shall be of standard design and required profile, with a 44mm wide edge all round, vertical reinforcing ribs pressed in and with two reinforcing rails welded in. The door shall be provided with a two lever mortice lock with lock box welded to inside. Doors shall be welded to steel butts.

PB3.3.17 Transformer Doors and Frames

Transformer doors and frames shall be as described in PB3.3.16, but the doors shall be fitted with a hasp and staple in lieu of mortice lock and each leaf fitted with a louvered grille of standard design backed with insect and vermin proofed gauze screen.

PB3.3.18 Steel windows, doors, etc. shall comply with SANS 727 and fittings shall be chrome plated. The windows, doors etc. shall have one coat of red oxide zinc chromate primer complying with SANS 679 applied prior to leaving the factory.

PB3.3.19 Steel Roller Shutters

Roller shutters shall be approved manufacture composed of curtain, vertical rails and top mechanism. The curtains shall be machine-rolled galvanized linked strips with mild steel end closing pieces riveted or spot welded to alternate strips. The bottom shall be provided with a rail riveted or welded on and vertical edges are to slide in rails fixed to sides of openings.

The mechanism shall be covered in a mild steel box. Before leaving the workshop of the manufacturer the ungalvanized sections shall be treated with red oxide zinc chromate primer complying with SANS 679.

PB3.3.20 Galvanized Sheet Iron

Galvanized sheet iron shall be rolled steel plates finished on both sides with Class C zinc coating complying with SANS ISO 9364. Sheets shall be free from white rust.

PB3.3.21 Glass

Glass shall comply with BS952. Clear sheet glass shall be "OQ" quality, free from bubbles, stains or scratches and of the following thicknesses:

For panes not exceeding 0,65m² 3mm

For panes exceeding 0,65m² and not exceeding 1,5m² 4mm

Wired obscure glass must be 6mm thick roughcast Georgian wired glass.

PB3.3.22 Putty

Glazing putty shall comply with SANS 680 – Type 2 for steel sashes.

PB3.3.23 Paints

Paints, pigments, primers and undercoats shall comply with the following requirements :

Red iron oxide pigment for paint – SANS 293 Type 1

Red lead pigment for paint – SANS 392

Emulsion paint for internal use – SANS 1586 – Grade 1

Emulsion paint for external use – SANS 1586 – Synthetic Polymer Base

Undercoats for paints (excluding emulsion paints) SANS 681 Type 1

Priming coats on galvanized iron – SANS 723

Red oxide zinc chromate primer – SANS 679

High gloss enamel paint for internal and external use–SANS 630 Grade1

Structural steel paint – SANS 684

Paint undercoats shall be as recommended by the manufacturer of the finishing coat.

PB4 PLANT

PB4.1 Sufficiency of plant, tools and equipment

The Contractor's plant, tools and equipment shall be of modern design and construction and adaptable to the duties required of them. They shall be in sound working condition

and shall be sufficiently ample in capacity and / or number for completing the Works in an expeditious manner.

Should the Engineer be of the opinion that the plant used by the Contractor is insufficient or in any way unsuitable for carrying out the Works in the manner or at a rate commensurate with the requirements of the contract he shall have the right to call upon the Contractor to provide such additional and approved plan, tools and equipment as may in his opinion be necessary to achieve these requirements.

PB5 CONSTRUCTION

PB5.1 Bricklayer

PB5.1.1 Cement Mortar

Cement mortar shall be composed of six parts by volume of sand to one part by volume of cement.. The materials shall be mixed dry until the mixture is uniform in colour whereupon clean water is to be added gradually and the mixture turned over until the ingredients are thoroughly incorporated. Cement mortar must be mixed in small quantities and must be used within one hour of mixing. Mortar that has commenced to set must be disposed of to waste and no addition of water will be permitted for re-tempering cement mortar.

PB5.1.2 Brickwork

Brickwork, wherever practicable, and not otherwise described, must be built in English bond. Half brick walls, walls in two skins and cavity walls must have the separate skins built in stretcher bond. No false headers are to be used and none but whole bricks used except where legitimately required to form bond.

The bricks are to be well wetted (saturated in hot weather) with water before being laid and the course of bricks last laid is to be well wetted before bedding fresh bricks upon it.

All perpends and angles are to be kept plumb,

The brickwork is to have the joints flushed up at every course solid throughout the whole width of the course, and each course is to be laid on a solid bed of mortar.

Pointing is to be done as the work proceeds.

The joints of all walls to be plastered or tiled are to be raked out 15mm as the work proceeds to form a key for plaster or screed.

All walls except gable and fire walls, are to be built up in regular and horizontal courses and carried up so that no part built is more than 1,2m higher than any adjoining walls.

Mortar beds generally are not to exceed 10mm in thickness, unless otherwise described.

Brickwork butting up against concrete work shall be secured by 1,6mm galvanized hoop iron straps 38mm wide and 750mm long fixed inside formwork with one end embedded in concrete and the other end bent back and built into brickwork. The straps shall be placed every 10 courses at each face to which brickwork abuts.

PB5.1.3 Cavity Walls

Cavity walls are to be built with two bricks skins with a cavity between the skins and the two skins tied together with wire ties, four to the metre square, carefully laid and in no case to fall inwards towards the inner skin of the wall.

Care must be taken to keep the cavity free from mortar droppings or other matter by movable boards or other means, and temporary openings must be left at plinth level through which any such droppings, etc. can be removed, and the openings made good on completion.

At door, window and other openings, the cavities shall be stopped 102,5mm back from heads, jambs and sills of openings.

PB5.1.4 Brickwork in Facing Brick

In all faced brickwork the bond must be set out on the first level course of brickwork, at floor level internally and two courses below ground level externally. Where required and shown on the Drawings soldier courses shall be built.

The bond, if necessary, is to be broken in the centre of panels under windows or to piers between windows.

No broken bonds will be allowed at reveals or quoins.

All perpends must be kept true and all courses must be built to gauge rods. Whether thinner facings than the standard are required, the facing bricks are to be machine cut to the required size.

Faggot bricks may not be used unless the express approval of the Engineer is first obtained.

Half brick walls built in facing bricks and pointed on both sides must be built in facing bricks specially selected for evenness of size to give and even face on both sides of the wall.

Facings must be carefully protected from damage, mortar droppings, paint splashes, etc. during the whole period of the Contract and. On completion, they must be thoroughly cleaned down and left perfect.

Scaffold planks should not be allowed to butt against facings except where this is unavoidable. During rain any such scaffold planks must be removed from contact with the facings.

The practice of oiling facings on completion will not be allowed.

PB5.1.5 Pointing of Face Bricks

Except where otherwise described, or where required to match existing work, all facings are to be pointed as the work proceeds with 10mm deep square recessed horizontal and flush vertical joints.

PB5.1.6 Brick Force

Brick force shall be built into brickwork every 5th course or as stated on drawings.

PB5.1.7 Damp proof Courses

Damp proof sheeting is to be cut into strips of the required width and laid on all foundation walls to the full thickness of the walls and without any longitudinal joints. At ends, angles and intersections the sheeting must be lapped 150mm and sealed. In cavity walls the sheeting must be laid across the full width of the wall, including the cavity, and must be stepped up one course in the cavity, over a cement triangular filled, so that the sheeting under the inner skin of the wall is higher than that under the outer skin of the wall.

Under all window sills exposed to the weather, the sheeting must be laid on the brickwork in the first joint immediately below the sill and turned up with an easy bend and tucked in to window frame.

PB5.1.8 Bedding and Pointing of Quarry Tiles

All quarry tiles must be bedded and jointed in cement mortar as described and flush pointed on all exposed faces.

The pointing must be executed with semi-dry cement mortar pressed in. Under no circumstances may liquid cement grout be used. All quarry tile work must be kept covered and protected from damage and any possibility of staining, discolouration or other damage. On completion all quarry tile work must be uncovered, checked for damage, repaired as necessary, cleaned down with soft soap and cold water and left perfect. Oiling of quarry tile work will not be permitted.

PB5.1.9 Window Sills

Internal and external window sills shall be Everite Nutec fibre cement window sills, or similar approved, 150mm wide x 15mm thick, with drip groove on external window sills. Window sills shall be bedded in cement mortar with metal fixing lug with the top edge of the sill under the leading edge of the window frame.

External window sills to be set at a 20 degree slope unless otherwise detailed with the exposed edge set 40mm clear of the finished outside wall. Care shall be exercised to ensure a watertight joint at the junction with the windows.

PB5.1.10 Beam filling

The space between top of brickwork at plate level and underside of roof covering must be filled in with beam filling half brick thick, cut and fitted around rafters, splay cut on top under roof covering and finished with a stiff mixture of 3 : 1 cement mortar tightly packed in. No beam filling must be used where a closed-in eaves construction is specified.

PB5.1.11 Ventilation

Where shown on the drawings, or where directed by the Engineer, ventilation must be provided as follows :

a) To Rooms

Form straight opening through brick wall, render smooth in 3 : 1 cement plaster, and supply and build in vermin proof terra-cotta louvered air brick flush with outer wall face.

b) To Roof Spaces

Form straight opening through gable wall, of size indicated on drawing, render smooth in 3 : 1 cement plaster and supply and build in vermin proof terra-cotta louvered air bricks flush with outer wall face.

PB5.1.12 Build in Steel Windows

All steel windows except where otherwise described or shown are to be placed 102,5mm back from external brick face, set up and pointed in 6 : 1 cement mortar. In face brick work the inner skin at reveals must be set to over sail the outer skin by at least 10mm.

PB5.1.13 Build in Steel Door Frames

All steel door frames shall be properly strutted and propped to avoid distortion. The frames shall be set in position, lugs built in and the brickwork shall be built hard against the frame, packed in with mortar and pointed all round.

PB5.1.14 Builders Work to Mechanical and Associated Electrical Installation

The mechanical and associated electrical installation including the supply and fixing of piping, ducting belt presses, pumps, blowers, compressors, mixers, associated electric motors etc. will be carried out under a separate contract.

Allowance must be made for giving every facility to and attending upon the contractors performing the installation; all lifting devices shall have been installed and commissioned in accordance with programme so as to be available for use by them. The Contractor under this Contract shall allow for making good in all trades on completion and for clearing away all rubbish that may accumulate. In addition allowance must be made for necessary cutting building in etc. as scheduled, at the appropriate times.

PB5.1.15 Builders Work to Electrical Installation

Allowance must also be made for all necessary chasing, building in of conduits forming recesses for switch boxes and distribution boards etc.

The Contractor shall chase brickwork where directed by the Engineer or the Electrician responsible for the electrical installation. Chasing shall precede plastering or rendering. In the case of un-plastered concrete walls electrical conduit shall either be cast into the concrete during pouring or shall be surface run afterwards as directed by the Engineer. In the case of face brick work, conduits shall be built in as the work progresses or be surface run as directed by the Engineer.

PB5.2 Carpenter and joiner

PB5.2.1 Splice Jointing

Each splice joint must be formed with two timber splice members of the same cross-section as the members to be spliced.

Splice members for jointing 114mm and 152mm timber must be 1m long and the joint must be secured with four 12mm diameter mild steel bolts with nuts and washers.

Splice members for joining 228mm timbers must be 1,25m long and the joint must be secured with eight 12mm diameter mild steel bolts with nuts and washers, staggered along the length of the splice.

The number of splices must be severely limited and as long single lengths as are obtainable must be used.

The number of splices allowable in structural timber will be:

Structural members up to 6m in length : No splices

Structural members between 6m and 12m in length : One splice

Structural members between 12m and 18m in length : Two splices

PB5.2.2 Finger Jointing

The finger joint profile, method of construction and strength of completed joints shall be in accordance with the South African Bureau of Standards Code of Practice for the Manufacture of Finger Jointed Structural Timber, SANS 096 and all finger jointed timber shall comply in all respects with the requirements laid down therein. The adhesive used in making the joints shall be Type WBP gap-filling for External Timber Structures, all as laid down in the British Standard Specification BSS 1204, as amplified by the Appendix attached to SANS 096.

All finger jointed timber shall be stamped with the letters "FJ" or "VL" in red for WBP Type, in addition to the Bureau mark and grade of timber identification letters.

In constructing roof trusses, etc. using finger jointed timbers, the greatest care must be taken to ensure that no finger joints occur in the section of timber to be drilled or spiked for intersections of truss members.

PB5.2.3 Fibre Cement Fascia and Barge Boards

Fibre cement fascia and barge boards shall be of the thickness and dimensions shown on the drawings. They shall be drilled, countersunk and screwed to eaves purling and rafter ends, or to end of purling with 50mm No. 10 gauge cadmium plated screws at 750mm centres for fascia with two screws at each rafter foot and at the end of each purling for barge boards.

Where joints occur in the length, they are to be joined with H-profile jointing strip, and to be bent over on the top edge. The corners of fascia boards to be joined with H-profile corner fascia joiner, and to be bent over on the top edge.

PB5.2.4 Fibre Cement Ceiling Plates

Fibre cement ceiling plates shall be of the thickness specified, free from cracks, twists, blemishes or other defects. The sheets must be in 900mm or 1200mm widths, drilled for, and neatly secured to brandering with 30mm clout headed nails at 100mm centres along edges of plates and at 150mm centres intermediately.

PB5.2.5 Gypsum Plaster Board Ceilings

Gypsum plaster board ceiling plates shall be 6,4mm thick, free from cracks, twists, blemishes or other defects. The sheets shall be of similar size and fixing shall be identical to that specified in PB5.2.4 above.

PB5.2.6 Ceiling Brandering

Except where otherwise shown on drawings, brandering to gypsum plasterboard or asbestos cement ceilings must be formed with 38mm by 55mm branders spaced at 450mm or 600mm centres at right angles to tie beams and 38mm by 38 mm branders at right angles, at 450mm centres, cut in between main branders, symmetrically arranged with narrow panels against walls to suit sizes of rooms and securely fixed with stout 75mm galvanized iron nails driven in on skew alternately in opposite directions to underside of roof timbers.

PB 5.2.7 Ceiling Trap Door

Ceiling plate and brandering shall be trimmed as necessary for trap door opening size 600mm by 600mm in clear with 38mm by 55mm trimmer all round to receive steel access door and frame.

PB5.2.8 Cover Strips and Cornices

Cover strips to gypsum plaster board ceilings must be of similar plasterboard in strip 50mm wide with smooth machined edges, neatly butt jointed and fixed with 2mm diameter galvanized iron or cadmium plated clout headed nails 40mm long spaced at 150mm centres.

Cover strips to asbestos cement ceilings must be 12,5mm by 38mm rounded South African pine strips, neatly scribed at intersections and fixed with 2mm diameter galvanized iron nails 40mm long at 150mm centres with heads punched in.

PB5.3 PLASTERER

PB5.3.1 Cement Plaster

Cement plaster on walls must be in the proportion of one part cement to six parts sand.

Cement plaster on concrete ceilings and beams, etc. must be in the proportion of one part cement to three parts sand.

Where a setting coat is required it must be composed of one part cement, two parts white lime putty and one part fine washed sand. Cement plaster must be mixed in small batches as no cement plaster that has once commenced to set will be allowed to be used.

Cement plaster to external panels must be in the proportion of one part cement to six parts sand, blended with Colorcem to give an even colour. A sample is to be prepared on site before the commencement of the work for colour approval by the Engineer.

PB5.3.2 Preparation of Plastering

All chases must be cut and electrical conducting and boxes fixed before any plastering is done. On no account will chasing be allowed in finished plaster work, and, if such chasing is necessary, the entire wall surface must be hacked off and re-plastered.

All joints in brickwork are to be well raked out, all surfaces, brickwork and concrete, to be plastered must be brushed down to remove all dirt and dust and be thoroughly wetted directly before plastering.

Concrete surfaces must be roughened or hacked as necessary to give a proper key for plaster. The surfaces must then be slushed with coarse cement grout before plastering is commenced.

The preparatory coats of plaster must be thoroughly scored and roughened to form a key for finishing coats.

PB5.3.3 Plastering Generally

Plastering of a surface will be executed in one operation as no joint marks will be allowed.

The surfaces of all internal plaster work must be steel trowelled to a smooth, even and true finish. External plaster must be finished to a true and even surface with a steel float.

Plaster must be returned into reveals and soffit of openings and all angles and edges must be true and straight.

All plaster surfaces must be free from blemishes and any cracks, blisters, or other defects must be cut out and made good and the whole left perfect at completion.

Plaster on walls must not be less than 12mm or more than 20mm in thickness, and plaster on concrete work must not be not less than 10mm or more than 15mm in thickness.

V-joints shall be formed at the junction of concrete and brickwork.

PB5.3.4 Floor Finishes

Finishes to concrete floors shall be as specified in SANS 1200 – G as amended by the Project Specification.

Cable ducts in floors shall be filled with clean river sand to a depth of 50mm from the finished concrete floor level after all cables are in position and have been tested. A 50mm layer of Class 20/19 concrete shall be placed on top of the sand and at the correct time finished with a steel trowel. V-joints shall be accurately formed at both sides of all cable ducts.

PB5.4 GLAZIER

PB5.4.1 Glazing

Glass panes must have adequate clearance between the edges of the glass and the rebates. Soft or oily putty shall not be painted and if the putty does not form a surface crust it shall be replaced. Back putty shall not exceed 3mm thick. Putty must be carefully trimmed and cleaned off with front putty worked to within 3mm of the sight line.

PB5.5 PAINTER

PB5.5.1 General

Descriptions of paintwork shall be deemed to include the preparation of surfaces, including filling, stopping, sanding and priming of nail heads and screws as well as all necessary priming, undercoats and finishing coats.

PB5.5.2 Plastered Surfaces

Plastered surfaces shall be thoroughly washed down and brushed in order to remove any traces of efflorescence and allowed to dry completely before any paint is applied. Before any paint is applied holes, cracks and irregularities in plaster and other surfaces shall be filled and finished smooth.

Unfinished concrete surfaces shall firstly be thoroughly cleaned with a spirits- of salts solution (1 part spirits-of –salts to 4 parts water) and all projections rubbed off.

PB5.5.3 Metal Surfaces

Steel surfaces shall be sanded, washed with a suitable cleaning agent and left smooth. Protective coatings applied to galvanized surfaces shall be removed with a galvanized iron cleaner using a bristle brush.

PB6 TOLERANCES

PB6.1 Position, dimensions, levels

A high degree of accuracy and attention to finish is required. Horizontal and vertical lines shall be truly horizontal and vertical respectively. The following components shall be within permissible deviations give below :

	<u>Component</u>	<u>Degree of Accuracy</u>
a)	Foundations	
	1) Positions of plan of any edge or surface from setting out lines	±30mm
	2) Linear dimension on plan cast against excavation sides	±40mm
	3) Linear dimension on plan cast against formwork	±20mm
b)	Elements above Foundations	
	1) Position on plan of any edge or surface from setting out lines	±15mm
	2) Linear (other than cross-section) dimensions	±20mm
	3) Cross-section dimensions	-5+5mm
	4) Level	-5+5mm
	5) Out-of-sequence of a corner or an opening, for short side of length	
	(i) up to and including 0,5m	±5mm
	(ii) over 0,5m up to and including 0,5m	±15mm
	(iii) over 2,0m up to and including 4m	±20mm
	6) Exposed surfaces	
	i) Flatness of plane surface	5mm
	ii) Abrupt changes in a continuous surface	5mm

PB7 TEST

Void.

PB8 MEASUREMENT AND PAYMENT

PB8.1 PRINCIPLES

PB8.1.1 All items scheduled are measured net with no allowance for waste. Items will be measured by number, mass, length, area or volume depending on the nature of the item.

PB8.2 BRICK LAYER ETC.

PB8.2.1 (a) Brickwork

Payment for brickwork will be made per square metre of finished brickwork of the various types and thicknesses measured in elevation. The rate shall be inclusive of all material required, lining and levelling, plumbing of corners and faces, forming reveals and openings, cutting where necessary beam fillings and for waste. The measurement of

brickwork shall be nett with window, door and louver panel openings deducted. No deductions will be made for lintels, airbricks, or small openings of up to 0,25m².

Brick walls Unit: m²

PB8.2.1 (b) Brick Force

Brick force shall be measured per linear metre of brick force built into walls.

Brick Force Unit: m

PB8.2.1 (c) 3 Layers of Malthoid

Supply and install 3 layers of Malthoid between concrete roof and brickwork or as specified on drawings Unit: m

PB8.2.1 (d) Concrete Lintel

Supply and install SANS approved concrete lintels over doors and windows or as specified on drawings Unit: No

PB8.2.2 Air vents

Air vents will be measured and paid for per number supplied and built into the work. The rate shall include for forming straight openings through brick walls, rendering smooth with 3:1 cement plaster and supply and build in vermin proof terra-cotta louvered air bricks flush with outer wall face and plaster or approved plastic grill flush with inner wall face.

Air vents Unit: m²

PB8.2.3 Door and Window Frames

Door and window frames will be measured and paid for per number of the different types scheduled supplied, set up and built into the work per specification. The rate shall include for building solid at reveals in the case of cavity walls Unit : No

PB8.2.4 Damp proof Courses

Damp proof course laid on walls, under sill etc. will be measured nett and paid for per square metre of approved DPC. DPC must overlap the full thickness of wall at ends and angles and 150mm at intermediate junctions Unit: m / m²

Waterproofing to concrete roof will be measured nett and paid for per square metreUnit: m²

PB8.2.5 Window sills

Window sills will be measured nett per linear metre of complete window sills of each type.....Unit: m

PB8.2.6 Chasing Walls

Chasing walls for electric conduits and small bore piping will be measured per linear metre of chase cut. The rate is to allow for cutting with a high speed cutter and for plastering flush with 3:1 plaster after the installation of conduits and piping has been completed and approved.....Unit : m

PB8.2.7 Rainwater Drainage

Supply and install 80mm diameter "Ezee-flo" or similar approved cast iron rainwater outlets in roof slabs as specified in the drawing.....Unit: No

GMS gutters will be measured and paid for per linear metre supplied and fixed at the relevant grades. The rate shall include gutter brackets, gutter joiners, stop ends and gutter outlets..... Unit: m

GMS downpipes will be measured and paid for per linear metre supplied and fixed. The rate shall include holder bats, shoe ends, and bends Unit: m

PB8.2.8 Tiling

The rate shall include furnishing, transporting and installing of tiles including all other materials and equipment required to complete tiling Unit: m²

PB8.2.9 River Sand will be measured per cubic metre and shall include supply, place and compact the river sand to the cable trenches Unit: m³

PB8.2.10 Corrugated roof Sheets

The rate shall include full compensation for furnishing, transporting and installing 0.5mm IBR corrugated roofing sheets including all materials and equipment required to complete the roof structure as per drawings. Unit: m³

PB8.3 Carpenter

PB8.3.1 Roof trusses in S.A. pine shall be measured and paid for by number supplied and secured in position Unit : No.

PB8.3.2 Rafters and wall plates shall be measured and paid for per nett linear metre supplied and fixed for the various sizes scheduled. No allowance will be made for waste Unit : m

PB8.3.3 Fibre cement fascia and barge boards shall be measured and paid for per linear metre inclusive of all supports and fixings Unit : m

PB8.3.4 Fibre cement ceilings shall be measured and paid for per square metre net inclusive of brandering as specified and closure strips Unit : m²

PB8.3.5 Chromadek fascia flashing trim will be measured and paid for per linear metre inclusive of all supports and fixing Unit: m

PB8.4 Plasterer

Cement plaster to vertical surfaces of brickwork or concrete as specified and inclusive of all door and window reveals, rounding's, drip moulds etc. with finishing shall be measured per square metre of finished plaster surface Unit : m²

PB8.5 Painting

Painting will be measured per square metre including for preparation, stopping, and applying all coats of the specified system. Items such as staircases, window frames, gutters, downpipes etc. will be scheduled separately per number. Unit : m² / No.

C3.5.9: PROJECT SPECIFICATION ADDITIONAL CLAUSES

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
C3.5.9.1	Environmental Management Plan.	655
C3.5.9.2	Health and Safety Specifications.	671

C3.5.9.1 ENVIRONMENTAL MANAGEMENT PLAN

1. SCOPE

This environmental management programme (EMP) sets out the methods by which proper environmental controls are to be implemented by the contractor. The duration over which the contractor's controls shall be in place cover the construction period of the project as well as the limited time after contract completion defined by the General Conditions of Contract, and the project specifications, as the defects notification period (maintenance period).

The provisions of this EMP are binding on the contractor during the life of the contract. They are to be read in conjunction with all the documents that comprise the suite of documents for this contract. In the event that any conflict occurs between the terms of the EMP and the project specifications or Record of Decision, the terms herein shall be subordinate.

The EMP is a dynamic document subject to similar influences and changes as are brought by variations to the provisions of the project specification. Any substantial changes shall be submitted to the DHS in writing for approval.

The EMP identifies the following:

Construction activities that will impact on the environment. Specifications with which the contractor shall comply in order to protect the environment from the identified impacts. Actions that shall be taken in the event of non-compliance.

2. DEFINITIONS

Alien Vegetation: alien vegetation is defined as undesirable plant growth which shall include, but not be limited to, all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

Construction Activity: a construction activity is any action taken by the contractor, his sub-contractors, suppliers or personnel during the construction process as defined in the South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7, 1998)

Environment: environment means the surroundings within which humans exist and that could be made up of -

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of (i) and (ii) and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Aspect: an environmental aspect is any component of a contractor's construction activity that is likely to interact with the environment.

Environmental Impact: an impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity.

Record of Decision: a record of decision is a written statement from the Mpumalanga Department of Economic Development, Environment and Tourism, that records its approval of a planned undertaking to improve, upgrade or rehabilitate a section of road and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.

Road Reserve: the road reserve is a corridor of land, defined by co-ordinates and proclamation, within which the road, including access intersections or interchanges, is situated. A road reserve may, or may not, be bounded by a fence.

Road Width: for the purposes of the EMP, the road width is defined as the area within the road reserve i.e. fence line to fence line, but also includes all areas beyond the road reserve that are affected by the continuous presence of the road, e.g. a reach of water course.

3. IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND IMPACTS

The contractor shall identify likely aspects before commencing with any construction activity. Examples of environment aspects include:

- waste generation
- storm water discharge
- emission of pollutants into the atmosphere
- chemical use operations
- energy use operations
- water use operations
- use of natural resources
- noise generation

Thereafter the contractor shall programme his work in such a way that each cause and effect of a construction activity is also identified and the activity planned so as to prevent any impact from happening. If prevention is not practicable, or in the event of mishap or misapplication, the contractor shall provide plans and measures for the engineer's approval, which will limit and contain the magnitude, duration and intensity of the impact. The contractor shall demonstrate that he/she is capable of carrying out any repair and reinstatement of the damaged environment. These requirements shall be concurrent with the time constraints to produce an approved construction programme according to sub-clause 8.3 as amended by Particular Condition of the general conditions of contract.

Listed below are some environmental impacts that could adversely alter an aspect of the environment through usual construction activities:

Pollution of atmosphere, soil or water

Destruction or removal of fauna and flora and effect on biological diversity

Deformation of the landscape

Soil erosion

Destruction of historical/heritage sites

Effect on the built environment

Effect on agricultural land and wetlands

General good construction practice will play an important role in avoiding the occurrence of an Impact. The contractor's attention is drawn, in this regard to the Environmental Management of Construction Activities

4. LEGAL REQUIREMENTS

a. General

Construction will be according to the best industry practices, as identified in the project documents. This EMP, which forms an integral part of the contract documents, informs the contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The contractor should note that obligations imposed by the EMP are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter shall prevail.

b. Statutory and other applicable legislation

The contractor is deemed to have made himself conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

5. ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS

a. Appointment of a Designated Environmental Officer (DEO)

For the purposes of implementing the conditions contained herein, the contractor shall submit to the engineer for approval the appointment of a nominated representative of the contractor as the DEO for the contract. The request shall be given, in writing, at least fourteen days before the start of any work clearly setting out reasons for the nomination, and with sufficient detail to enable the engineer to make a decision. The engineer will, within seven days of receiving the request, approve, reject or call for more information on the nomination. Once a nominated representative of the contractor has been approved he/she shall be the DEO and shall be the responsible person for ensuring that the provisions of the EMP are complied with during the life of the contract. The engineer will be responsible for issuing instructions to the contractor where environmental considerations call for action to be taken. The DEO shall submit regular written reports to the engineer, but not less frequently than once a month.

The engineer shall have the authority to instruct the contractor to replace the DEO if, in the engineer's opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the EMP or this specification. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required.

There shall be an approved DEO on the site at all times.

b. Administration

Before the contractor begins each construction activity the DEO shall give to the engineer a written statement setting out the following:

The type of construction activity.

Locality where the activity will take place.

Identification of the environmental aspects and impacts that might result from the activity.

Methodology for impact prevention for each activity or aspect.

Methodology for impact containment for each activity or aspect.

Emergency/disaster incident and reaction procedures.

Treatment and continued maintenance of impacted environment.

The contractor may provide such information in advance of any or all construction activities provided that new submissions shall be given to the engineer whenever there is a change or variation to the original.

The engineer may provide comment on the methodology and procedures proposed by the DEO, but he shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly

c. Good Housekeeping

The Contractor shall undertake "good housekeeping" practices during construction as stated in sub-clauses 4.18 and 11.11 of the General Conditions of Contract. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

6. TRAINING

The designated environmental officer (DEO) must be conversant with all legislation pertaining to the environment applicable to this contract and must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management skills to all personnel involved in the contract.

The contractor shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. The environmental training should, as a minimum, include the following:

- The importance of conformance with all environmental policies
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Agency's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;

- The mitigation measures required to be implemented when carrying out their work activities. In the case of permanent staff, the contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the contractor shall inform the engineer when and how he/she intends concluding his environmental training obligations.

7. ACTIVITIES/ASPECTS CAUSING IMPACTS

A list of possible causes of environmental impacts that occur during construction activities is given in Table 7/1: Aspects or Activities that Cause Environmental Impacts during Construction Activities, which is to be found at the end of this part. This list is not exhaustive, and shall be used for guideline purposes only.

8. ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES

a. Site Establishment

i. Site Plan:

The contractor shall establish his construction camps, offices, workshops, staff accommodation and testing facilities on the site in a manner that does not adversely affect the environment. However, before construction can begin, the contractor shall submit to the engineer for his approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the contractor proposes to put in place.

The plans shall detail the locality as well as the layout of the waste treatment facilities for litter, kitchen refuse, sewage and workshop-derived effluents. The site offices should not be sited in close proximity to steep areas, as this will increase soil erosion. Preferred locations would be flat areas along the route. If the route traverses water courses, streams and rivers, it is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles are located as far away as possible from any water course as possible. Regardless of the chosen site, the contractor's intended mitigation measures shall be indicated on the plan. The site plan shall be submitted not later than the first site meeting. Detailed, electronic colour photographs shall be taken of the proposed site before any clearing may commence. These records are to be kept by the engineer for consultation during rehabilitation of the site.

ii. Vegetation:

The contractor has a responsibility to inform his staff of the need to be vigilant against any practice that will have a harmful effect on vegetation.

The natural vegetation encountered on the site is to be conserved and left as intact as possible. Vegetation planted at the site shall be indigenous and in accordance with instructions issued by the engineer. Only trees and shrubs directly affected by the works, and such others as may be indicated by the engineer in writing, may be felled or cleared. In wooded areas where natural vegetation has been cleared out of necessity, the same species of indigenous trees as were occurring, shall be re-established.

The project specification for the rehabilitation of the grass cover shall be strictly adhered to. Any proclaimed weed or alien species that propagates during the contract period shall be cleared by hand before seeding. Fires shall only be allowed in facilities or equipment specially constructed for this purpose. A firebreak shall be cleared and maintained around the perimeter of the camp and office sites.

iii. Rehabilitation:

The area where the site offices were erected will require rehabilitation at the end of the contract. All construction material, including concrete slabs and braai areas shall be removed from the site on completion of the contract.

iv. Water for human consumption:

Water for human consumption shall be available at the site offices and at other convenient locations on site.

All effluent water from the camp / office sites shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water sources (streams,

rivers, pans dams etc.). Only domestic type wastewater shall be allowed to enter this drain.

- v. Heating and Cooking fuel:
The contractor shall provide adequate facilities for his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.
- b. Sewage treatment:
Particular reference in the site establishment plan shall be given to the treatment of sewage generated at the site offices, site laboratory and staff accommodation and at all localities on the site where there will be a concentration of labour. Sanitary arrangements should be to the satisfaction of project management, the local authorities and legal requirements.
Safe and effective sewage treatment will require one of the following sewage handling methods: septic tanks and soak-aways, dry-composting toilets such as “enviro loos”, or the use of chemical toilets which are supplied and maintained by a sub-contractor. The type of sewage treatment will depend on the geology of the area selected, the duration of the contract and proximity (availability) of providers of chemical toilets. Should a soak-away system be used, it shall not be closer than 800 metres from any natural water course or water retention system. The waste material generated from these facilities shall be serviced on a regular basis. The positioning of the chemical toilets shall be done in consultation with the engineer. Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on the works. Use of the veld for this purpose shall not, under any circumstances, be allowed.
Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. The toilets shall also be placed outside areas susceptible to flooding. The contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the engineer.
- c. Waste Management:
The contractor’s intended methods for waste management and waste minimisation shall be implemented at the outset of the contract. All personnel shall be instructed to dispose of all waste in the proper manner.
 - i. Solid Waste:
Solid waste shall be stored in an appointed area in covered, tip proof metal drums for collection and disposal. A refuse control system shall be established for the collection and removal of refuse to the satisfaction of the engineer. Disposal of solid waste shall be at a Department of Water Affairs and Forestry (DWAF) licensed landfill site or at a site approved by DWAF in the event that an existing operating landfill site is not within reasonable distance from the site offices and staff accommodation. No waste shall be burned or buried at or near the site offices, or anywhere else on the site, including the approved solid waste disposal site.
 - ii. Litter:
No littering by construction workers shall be allowed. During the construction period, the facilities shall be maintained in a neat and tidy condition and the site shall be kept free of litter.
Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. At all places of work the contractor shall provide litter collection facilities for later safe disposal at approved sites.
 - iii. 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 shall be taken to avoid spillage of tar or bitumen products such as binders or pre-coating fluid to avoid water-soluble phenols from entering the ground or contaminating water.
Under no circumstances shall the spoiling of tar or bituminous products on the site, over embankments, in borrow pits or any burying, be allowed. Unused or rejected tar or bituminous products shall be returned to the supplier’s production plant. Any spillage of

tar or bituminous products shall be attended to immediately and affected areas shall be promptly reinstated to the satisfaction of the engineer.

d. Control at the workshop:

The contractor's management and maintenance of his plant and machinery will be strictly monitored according to the criteria given below, regardless whether it is serviced on the site (i.e. at the place of construction activity or at a formalised workshop).

i. Safety:

All the necessary handling and safety equipment required for the safe use of petrochemicals and oils shall be provided by the contractor to, and used or worn by, the staff whose duty it is to manage and maintain the contractor's and his sub-contractor's and supplier's plant, machinery and equipment.

ii. Hazardous Material Storage:

Petrochemicals, oils and identified hazardous substances shall only be stored under controlled conditions. All hazardous materials e.g. tar or bitumen binders shall be stored in a secured, appointed area that is fenced and has restricted entry. Storage of tar or bituminous products shall only take place using suitable containers to the approval of the engineer.

The contractor shall provide proof to the engineer that relevant authorisation to store such substances has been obtained from the relevant authority. In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure. Before containment or storage facilities can be erected the contractor shall furnish the engineer with details of the preventative measures he proposes to install in order to mitigate against pollution of the surrounding environment from leaks or spillage. The preferred method shall be a concrete floor that is bunded. Any deviation from the method will require proof from the relevant authority that the alternative method proposed is acceptable to that authority. The proposals shall also indicate the emergency procedures in the event of misuse or spillage that will negatively affect an individual or the environment.

iii. Fuel and Gas Storage:

Fuel shall be stored in a secure area in a steel tank supplied and maintained by the fuel suppliers... An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to accommodate any leakage spillage or overflow of these substances. The area inside the bund wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. Any leakage, spillage or overflow of fuel shall be attended to without delay.

Gas welding cylinders and LPG cylinders shall be stored in a secure, well-ventilated area.

iv. Oil and Lubricant Waste:

Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and sent back to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, shall be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials. Oil collected by a mobile servicing unit shall be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company.

All used filter materials shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced. Soils contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials.

e. Clearing the Site:

In all areas where the contractor intends to, or is required to clear the natural vegetation and soil, either within the road reserve, or at designated or instructed areas outside the road reserve, a plan of action shall first be submitted to the engineer for his approval.

The plan shall contain a photographic record and chainage/land reference of the areas to be disturbed. This shall be submitted to the engineer for his records before any disturbance/stockpiling may occur. The record shall be comprehensive and clear, allowing for easy identification during subsequent inspections.

The contractor shall be responsible for the re-establishment of grass within the road reserve boundaries for all areas disturbed during road construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for, or from, road construction has to be stored temporarily or otherwise within the road reserve, or at designated or instructed areas outside the road reserve. This responsibility shall extend until expiry of the defects notification period.

f. Soil Management:

i. Topsoil:

Topsoil shall be removed from all areas where physical disturbance of the surface will occur and shall be stored and adequately protected. The contract will provide for the stripping and stockpiling of topsoil from the site for later re-use. Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. Depth may vary at each site. The areas to be cleared of topsoil shall include the storage areas. All topsoil stockpiles and windrows shall be maintained throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand. Soils contaminated by hazardous substances shall be disposed of at an approved Department of Water Affairs and Forestry waste disposal site. The topsoil stockpiles shall be stored, shaped and sited in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water. Stockpiles of topsoil shall not exceed a height of 2m, and if they are to be left for longer than 6 months, shall be analysed, and if necessary, upgraded before replacement. Stockpiles shall be protected against infestation by weeds.

The contractor shall ensure that no topsoil is lost due to erosion – either by wind or water. Areas to be topsoiled and grassed shall be done so systematically to allow for quick cover and reduction in the chance of heavy topsoil losses due to unusual weather patterns. The contractor's programme shall clearly show the proposed rate of progress of the application of topsoil and grassing. The contractor shall be held responsible for the replacement, at his own cost, for any unnecessary loss of topsoil due to his failure to work according to the progress plan approved by the engineer. The contractor's responsibility shall also extend to the clearing of drainage or water systems within and beyond the boundaries of the road reserve that may have been affected by such negligence.

ii. Subsoil:

The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed, to a depth instructed by the engineer, and stored separately from the topsoil if not used for road building. This soil shall be replaced in the excavation in the original order it was removed for rehabilitation purposes.

g. Drainage:

The quality, quantity and flow direction of any surface water runoff shall be established prior to disturbing any area for construction purposes. Cognisance shall be taken of these aspects and incorporated into the planning of all construction activities. Before a site is developed or expanded, it shall be established how this development or expansion will affect the drainage pattern. Recognised water users / receivers shall not be adversely affected by the expansion or re-development. No water source shall be polluted in any way due to proposed changes. Streams, rivers, pans, wetlands, dams, and their catchments shall be protected from erosion and from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous or tar products.

The contractor shall submit to the engineer his proposals for prevention, containment and rehabilitation measures against environmental damage of the identified water and drainage systems that occur on the site. Consideration shall be given to the placement of sedimentation ponds or barriers where the soils are of a dispersive nature or where toxic fluids are used in the construction process. The sedimentation ponds must be large enough to contain runoff so that they function properly under heavy rain conditions.

h. Earthworks and Layer works:

This section includes all construction activities that involve the mining of all materials, and their subsequent placement, stockpile, spoil, treatment or batching, for use in the permanent works, or temporary works in the case of deviations. Before any stripping prior to the commencement of construction, the contractor shall have complied with the requirements of sections C1008 (e) and C1008 (g). In addition, the contractor shall take cognisance of the requirements set out below.

i. Quarries and borrow pits:

The contractor's attention is drawn to the requirement of the Department of Minerals and Energy, that before entry into any quarry or borrow pit, an EMP for the establishment, operation and closure of the quarry or borrow pit shall have been approved by the Department. It is the responsibility of the contractor to ensure that he is in possession of the approved EMP or a copy thereof, prior to entry into the quarry or borrow pit. The conditions imposed by the relevant EMP are legally binding on the contractor and may be more extensive and explicit than the requirements of this specification. In the event of any conflict occurring between the requirements of the specific EMP and these specifications the former shall apply. The cost of complying with the requirements shall be deemed to be included in existing rates in the Bill of Quantities.

ii. Excavation, hauling and placement:

The contractor shall provide the engineer with detailed plans of his intended construction processes prior to starting any cut or fill or layer. The plans shall detail the number of personnel and plant to be used and the measures by which the impacts of pollution (noise, dust, litter, fuel, oil, sewage), erosion, vegetation destruction and deformation of landscape will be prevented, contained and rehabilitated. Particular attention shall also be given to the impact that such activities will have on the adjacent built environment. The contractor shall demonstrate his "good housekeeping", particularly with respect to closure at the end of every day so that the site is left in a safe condition from rainfall overnight or over periods when there is no construction activity.

iii. Spoil sites:

The contractor shall be responsible for the safe siting, operation, maintenance and closure of any spoil site he uses during the contract period, including the defects notification period. This shall include existing spoil sites that are being re-entered. Before spoil sites may be used proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the engineer for his approval. The location of these spoil sites shall have signed approval from the affected landowner before submission to the engineer. No spoil site shall be located within 500m of any watercourse. A photographic record shall be kept of all spoil sites for monitoring purposes. This includes before the site is used and after re-vegetation.

The use of approved spoil sites for the disposal of hazardous or toxic wastes shall be prohibited unless special measures are taken to prevent leaching of the toxins into the surrounding environment. Such special measures shall require the approval of the relevant provincial or national authority. The same shall apply for the disposal of solid waste generated from the various camp establishments. The engineer will assist the contractor in obtaining the necessary approval if requested by the contractor.

Spoil sites will be shaped to fit the natural topography. These sites shall receive a minimum of 75mm topsoil and be grassed with the recommended seed mixture. Slopes shall not exceed a vertical: horizontal ratio of 1:3. Only under exceptional circumstances will approval be given to exceed this ratio. Appropriate grassing measures to minimise soil erosion shall be undertaken by the contractor. This will include both strip and full sodding. The contractor may motivate to the engineer for other acceptable stabilising methods. The engineer may only approve a completed spoil site at the end of the defects notification period upon receipt from the contractor of a landowner's clearance notice and an engineer's certificate certifying slope stability. The contractor's costs incurred in obtaining the necessary certification for opening and closing of spoil sites shall be deemed to be included in the tendered rates for spoiling.

iv. Stockpiles:

The contractor shall plan his activities so that materials excavated from borrow pits and cuttings, in so far as possible, can be transported direct to and placed at the point where it is to be used. However, should temporary stockpiling become necessary, the areas for the stockpiling of excavated and imported material shall be indicated and demarcated

on the site plan submitted in writing to the engineer for his approval, together with the contractor's proposed measures for prevention, containment and rehabilitation against environmental damage.

The areas chosen shall have no naturally occurring indigenous trees and shrubs present that may be damaged during operations. Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of the stockpiles the contractor shall at all times ensure that they are:

Positioned and sloped to create the least visual impact;

Constructed and maintained so as to avoid erosion of the material and contamination of surrounding environment; and

Kept free from all alien/undesirable vegetation

After the stockpiled material has been removed, the site shall be re-instated to its original condition. No foreign material generated / deposited during construction shall remain on site. Areas affected by stockpiling shall be landscaped, top soiled, grassed and maintained at the contractor's cost until clearance from the engineer and the relevant Authority is received.

Material milled from the existing road surface that is temporarily stockpiled in areas approved by the engineer within the road reserve, shall be subject to the same condition as other stockpiled materials. Excess materials from windrows, in-situ milling or any detritus of material from road construction activities may not be swept off the road and left unless specifically instructed to do so in the contract drawing or under instruction from the engineer

In all cases, the engineer shall approve the areas for stockpiling and disposal of construction rubble before any operation commences and shall approve their clause only when they have been satisfactorily rehabilitated.

v. Blasting activities:

Wherever blasting activity is required on the site (including quarries and/or borrow pits) the contractor shall rigorously adhere to the relevant statutes and regulations that control the use of explosives. In addition, the contractor shall, prior to any drilling of holes in preparation for blasting, supply the engineer with a locality plan of the blast site on which shall be shown the zones of influence of the ground and air shock-waves and expected limits of fly-rock. The plan shall show each dwelling, structure and service within the zones of influence and record all details of the dwellings/structures/services including existing positions, lengths and widths of cracks, as well as the condition of doors, windows, roofing, wells, boreholes etc. The contractor, alone, shall be responsible for any costs that can be attributed to blasting activities, including the collection of fly-rock from adjacent lands and fields. The submission of such a plan shall not in any way absolve the contractor from his responsibilities in this regard. The contractor shall also indicate to the engineer the manner in which he intends to advertise to the adjacent communities and/or road users the times and delays to be expected for each individual blast.

i. Batching sites:

Asphalt plants are considered scheduled processes listed in the second schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965). Should the use of an asphalt plant be considered on site, the contractor shall be responsible to obtain the necessary permit from the Department of Environmental Affairs and Tourism, regardless of where they are sited. Crushing plants and concrete batching plants, whether sited inside or outside of defined quarry or borrow pit areas, shall be subject to the requirements of the Department of Minerals and Energy legislation as well as the applicable industrial legislation that governs gas and dust emissions into the atmosphere. Such sites will be the subject of regular inspections by the relative authorities during the life of the project. In addition, the selection, entry onto, operation, maintenance, closure and rehabilitation of such sites shall be the same as for those under section C1008(h)(iii), with the exception that the contractor shall provide additional measures to prevent, contain and rehabilitate against environmental damage from toxic/hazardous substances. In this regard the contractor shall provide plans that take into account such additional measures as concrete floors, bunded storage facilities, linings to drainage channels and settlement dams. Ultimate approval of these measures shall be from the relevant national authority, as shall approval of closure. The engineer will assist the contractor in his submissions to the relevant authority.

Effluent from concrete batch plants and crusher plants shall be treated in a suitable designated sedimentation dam to the legally required standards to prevent surface and groundwater pollution. The designs of such a facility should be submitted to the engineer for approval. The contractor shall invite the relevant department to inspect the site within 2 months after any plant is commissioned and at regular intervals thereafter, not exceeding 12 months apart

j. Spillages:

Streams, rivers and dams shall be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and tar or bituminous products. In the event of a spillage, the contractor shall be liable to arrange for professional service providers to clear the affected area. Responsibility for spill treatment lies with the contractor. The individual responsible for, or who discovers a hazardous waste spill must report the incident to his/her DEO or to the engineer. The Designated Environmental Officer will assess the situation in consultation with the engineer and act as required. In all cases, the immediate response shall be to contain the spill. The exact treatment of polluted soil / water shall be determined by the contractor in consultation with the DEO and the engineer. Areas cleared of hazardous waste shall be re-vegetated according to the engineer's instructions

Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed. The requirement for such input shall be agreed with the engineer. The costs of containment and rehabilitation shall be for the contractor's account, including the costs of specialist input.

k. Areas of Specific Importance:

Any area, as determined and identified within the project document as sensitive or of special interest within the site shall be treated according to the express instructions contained in these specifications or the approved EMP. The contractor may offer alternative solutions to the engineer in writing should he consider that construction will be affected in any way by the hindrance of the designated sensitive area or feature. However, the overriding principle is that such defined areas requiring protection shall not be changed. Every effort to identify such areas within the site will have been made prior to the project going out to tender. The discovery of other sites with archaeological or historical interest that have not been identified shall require ad hoc treatment.

i. Archaeological Sites:

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the engineer of such discovery. The South African Heritage Research Agency (SAHRA) is to be contacted who will appoint an archaeological consultant. Work may only resume once clearance is given in writing by the archaeologist.

ii. Graves and middens:

If a grave or midden is uncovered on site, or discovered before the commencement of work, then all work in the immediate vicinity of the graves/middens shall be stopped and the engineer informed of the discovery. SAHRA should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The Employer will be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred.

l. Noise Control:

The contractor shall endeavour to keep noise generating activities to a minimum. Noises that could cause a major disturbance, for instance blasting and crushing activities, should only be carried out during daylight hours. Compliance with the appropriate legislation with respect to noise, shall be mandatory.

Should noise generating activities have to occur at night the people in the vicinity of the drilling shall be warned about the noise well in advance and the activities kept to a minimum.

m. Dust Control:

Dust caused by strong winds shall be controlled by means of water spray vehicles. Dust omission from batching plants shall be subject to the relevant legislation and shall be the subject of inspection by the relevant office of the Department of Minerals and Energy.

n. Alien Vegetation:

The contractor shall be held responsible for the removal of alien vegetation within the road reserve disturbed during road construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for or from road construction has been stored temporarily or otherwise within the road reserve. This responsibility shall extend for the duration of the defects notification period.

9. **RECORD KEEPING**

The engineer and the DEO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the engineer shall issue to the contractor a notice of non-compliance whenever transgressions are observed. The DEO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the engineer in the monthly report.

Copies of any record of decision or EMP's for specific borrow pits or quarries used on the project shall be kept on site and made available for inspection by visiting officials from the employer or relevant environmental departments.

10. **COMPLIANCE AND PENALTIES**

The contractor shall act immediately when such notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. This record shall be submitted with the monthly reports and a verbal report given at the monthly site meetings.

Any avoidable non-compliance with the above-mentioned measures shall be considered sufficient ground for the imposition of a penalty

The following penalties shall apply for environmental violations:

a. **Unnecessary removal or damage to trees**

2600mm girth or less	:	R 5 000 per tree
Greater than 2600mm, but less than 6180mm girth	:	R10 000 per tree
Greater than 6180mm girth	:	R30 000 per tree

b. **Serious violations:**

• Hazardous chemical/oil spill and/or dumping in non-approved sites	:	R10 000 per incident
• General damage to sensitive environments	:	R 5 000 per incident
• Damage to cultural and historical sites	:	R 5 000 per incident
• Uncontrolled/unmanaged erosion (plus rehabilitation at contractor's cost).	:	R1 000 to R5 000 per incident
• Unauthorised blasting activities.	:	R5 000 per incident
• Pollution of water sources.	:	R10 000 per incident

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final.

c. **Less serious violations:**

Littering on site		
Lighting of illegal fires on site.		
Persistent or un-repaired fuel and oil leaks.		
Excess dust or excess noise emanating from site.		
Dumping of milled material in side drains or on grassed areas	:	R1 000 per incident

Possession or use of intoxicating substances on site.	:	R 500 per incident
Any vehicles being driven in excess of designated speed limits.	:	R 500 per incident
Removal and/or damage to flora or cultural or heritage objects on site, and/or killing of wildlife.	:	R2 000 per incident
Illegal hunting	:	R2 000 per incident
Urination and defecation anywhere except in designated areas.	:	R 500 per incident

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final. The imposition of such a penalty shall not preclude the relevant provincial or national authority from applying an additional penalty in accordance with its statutory powers. Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as it deems fit.

11. MEASUREMENT AND PAYMENT

The cost of complying to this specification shall be deemed to be included in the rates tendered for this project.

11.1 Penalty for unnecessary removal or damage to trees for the following diameter sizes

	ITEM	UNIT
a.	2600mm girth or less	Number (no)
b.	Greater than 2600mm, but less than 6180mm girth	Number (no)
c.	Greater than 6180mm girth	Number (no)

The unit of measurement shall be the number of trees by diameter size removed unnecessary or damaged. The penalty rates applied shall be those stated in clause C3.5.2.10.

11.2 Penalty for serious violations

	ITEM	UNIT
a.	Hazardous chemical/oil spill and/or dumping in non-approved sites	Number (no)
b.	General damage to sensitive environments	Number (no)
c.	Damage to cultural and historical sites	Number (no)
d.	Pollution of water sources	Number (no)
e.	Unauthorised blasting activities	Number (no)
f.	Uncontrolled/unmanaged erosion per incident, depending on environment impacts, plus rehabilitation at contractor's cost)	Number (no)

The unit of measurement for C100.02 (a) to (f) shall be the number of serious violation incidents. The penalty rates to be applied shall be those stated in clause

11.3	Penalty for less serious violations	Number (no)
	ITEM	UNIT
a.	Littering on site	Number (no)
b.	Lighting of illegal fires on site	Number (no)

c.	Persistent or un-repaired fuel and oil leaks	Number (no)
d.	Excess dust or excess noise emanating from site	Number (no)
e.	Dumping of milled material in side drains or on grassed areas	Number (no)
f.	Possession or use of intoxicating substances on site	Number (no)
g.	Any vehicles being driven in excess of designated speed limits	Number (no)
h.	Removal and/or damage to flora or cultural or heritage objects on site, and/or killing of wildlife	Number (no)
i.	Illegal hunting	Number (no)
j.	Urination and defecation anywhere except in designated areas	Number (no)

The unit of measurement shall be the number of less serious violation incidents. The penalty rates applied shall be those stated in clause C3.3.3.9.

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final. The calculation shall include allied construction activities in the same way as the calculation of reduced payments under Section 7: EMP. The imposition of such a penalty shall not preclude the relevant provincial or national authority from applying an additional penalty in accordance with its statutory powers. Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as it deems fit.

Table 1: Mechanisms that Cause Environmental Impacts during Construction Activities

SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				SENSITIVE AREAS (to be completed by compiler)
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	
SANS 1200A	Camp Establishment	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
SANS 1200A	Housing, Offices and laboratories	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
SANS 1200A	Accommodation of Traffic	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas Maintenance of windrows	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
SANS 1200D	Overhaul	Spillage Storage Noise/lights Dust control Exhaust fumes Washing waste	Turning circles Parking areas	Restrict access to sensitive areas	Protection of indigenous vegetation Preserve topsoil	
SANS 1200C	Clearing and grubbing	Waste treatment Hazardous waste Water supply Noise /lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Protection of indigenous vegetation Preserve topsoil	
SANS 1200LE	Drainage	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
SANS 1200D	Borrow pits	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	

SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				SENSITIVE AREAS (to be completed by compiler)
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	
SANS 1200D	Stockpiling	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
SANS 1200D	Mass Earthworks	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
SANS 1200MF	Pavement layers	Waste treatment Hazardous waste Water supply Spillage Storage Noise / lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas Maintenance of windrows	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
SANS 1200MH	Asphalt works / sealing operations	Waste treatment Hazardous waste Water supply Spillage Storage Noise / lights Dust control Smoke control Storage of materials	Selection of site Preserve indigenous vegetation Preserve topsoil Turning circles Parking areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil	
SANS 1200MM	Ancilliary roadworks	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
SANS 1200AH	Structures	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
SANS 1200MJ	Concrete pavements etc.	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	

C3.5 HEALTH and SAFETY SPECIFICATIONS

.9.2

1. BACKGROUND

In terms of the Construction Regulation 4 (1) (a) of the Occupational Health and Safety Act, No. 85 of 1993, the DHS, as the Client, is required to compile a Health & Safety Specification for the intended project and provide such specification to any prospective tenderer.

The Client's further duties are as 4(1) to 4(6) in The Construction Regulations, July 2003.

2. SCOPE

Development of Health & Safety Specification that addresses all aspects of occupational health and safety as pertaining to the works

3. OHS MANAGEMENT

3.1 Structure and Organisation of OHS Responsibilities

3.1.1. Overall Supervision and Responsibility for OHS

- The Client is to ensure that the Principal Contractor, appointed in terms of Construction Regulation 4(1) (c), implements and maintains the agreed and approved OHS Plan.
- The Chief Executive Officer of the Principal Contractor in terms of Section 16 (1) of the Act is to ensure that the Employer (as defined in the Act) complies with the Act.
- Any OHS Act (85 /1993), Section 16 (2) appointee/s as detailed in his/her respective appointments
- The Construction Supervisor and Assistant Construction Supervisor/s appointed in terms of Construction Regulation 6.

3.1.2. Further (Specific) Supervision Responsibilities for OHS

Appointments required by the Act and Regulations:

- OHS Representatives (Sections 17/18 of the Act)
- OHS Committees (Sections 19/20 of the Act)
- Risk Assessor (Construction Regulation. 7 (1))
- Accident/incident Investigations Co-ordinator (General Admin Regulation 9 (2)
- Form/Support work Supervisor (Construction Regulation 10(a)
- Batch Plant Supervisor (Construction Regulation 18(1)
- Stacking & Storage Supervisor (Construction Regulation 26(a)
- Fire Equipment Inspector (Construction Regulation 27(h)
- Electrical Installations, Machinery & Appliances Inspector (Construction Regulation 22)
- Excavations Supervisor (Construction Regulation 11(1)
- Demolition Supervisor (Construction Regulation 12(1)
- OHS Officer (where necessary) (Construction Regulation 6(6)
- Person Responsible for Machinery (General Machinery Regulation 2)
- Emergency, Security and Fire Co-ordinator (Construction Regulation 27(h) & Environmental Regulation 9)
- Fire Equipment Inspector (Construction Regulation 27(h) Environmental Regulation 9)
- First Aider (General Safety Regulation 3(2)
- Hazardous Chemical Substances Supervisor (HCS Regulations)
- Ladders Inspector (General Safety Regulation 13A)
- Lifting Equipment Inspector (Construction Regulation 20)
- Operators & Drivers of Construction Plant & Vehicles (Construction Reg. 21 (i)
- Structures Supervisor (Construction Regulation 9)
- Users Operators of Construction Equipment (Construction Regulation 21 (i)
- Welding Supervisor (General Safety Regulation 9)

3.2 Communication and Liaison

- OHS liaison between the Client, the Principal Contractor, the other Contractors concerned parties will be through the OHS Committee as in 3.10
- In addition to the above, communication may be directly to the Client or his appointed Agent, verbally or writing, as and when the need arises
- Consultation with the workforce on OHS matters will be through their Supervisors, OHS Representatives, the OHS Committee and their elected Trade Union Representatives, if any
- The Principal Contractor will be responsible for the dissemination of all relevant OHS information to the other Contractors e.g. changes agreed with the Client, instructions by the Client and/or his/her agent, exchange of information between Contractors, the reporting of hazardous/dangerous conditions/situations etc.

3.3 OHS File

The Principal Contractor must, in terms of Construction Regulation 5 (7), keep a health and safety file on site at all times that must include all documentation required in terms of the Act and Regulations and must also include a list of all Contractors on site that are accountable to the Principal Contractor and the agreements between the parties and details work being done. The following documents must be kept in the OHS file:

- Notification of Construction Work (Construction Regulation 3.)
- Copy of OHS Act (updated) (General Administrative Regulation 4.)
Proof of Registration and good standing with a COID Insurer (Construction Reg. 4 (g))
- Copy of health and safety plan (construction regulation 5 (1))
- OHS Programme agreed with Client including the underpinning Risk Assessment and Method Statements (Construction Regulation 5 (1))
- Designs/drawings (Construction Regulation 5 (8))
- A list of Contractors (Sub-contractors) including copies of the agreements between the parties and the type of work being done by each contractor (Construction Regulation 9)
- Appointment/ Designation forms as per 3.1.1. and 3.1.2. above.
- Registers as follows:
 - Accident/Incident Register (Annexure 1 of the General Administrative Regulations)
 - OHS Representatives Inspection Register
 - Excavations Inspection
 - Lifting Equipment
 - Demolition Inspections
 - Designer's Inspection of Structures Record
 - Batch Plant Inspections
 - Arc & Gas Welding & Flame Cutting Equipment Inspections
 - Construction Vehicles & Mobile Plant Inspection
 - Electrical Installation and Machinery Inspection
 - Fire Equipment Inspection & Maintenance
 - First Aid
 - Hazardous Chemical Substances Lifting Tackle and Equipment Inspections
 - Inspection of Cranes Inspection of Ladders Inspection of Vessels under Pressure
 - Machinery Inspections
 - Drivers/Operators of Mobile Plant/Construction Vehicles Daily Inspections

The Principal Contractor will be required to submit the abovementioned registers monthly to the chairperson of the OHS Committee for endorsement.

The Health & Safety File must be handed over to the Client on completion of the contract. It must contain all the documentation handed to the Principal Contractor by any sub-contractors together with a record of all drawings, designs, materials used and other similar information concerning the completed project.

3.4 OHS Goals and Objectives and Arrangements for Monitoring and Review of OHS Performance

The Principal Contractor is required to maintain a Compensation Incidence Frequency Rate (CIFR) of at least 8.

Identification of Hazards and Development of Risk Assessments, Standard Working Procedures (SWP) and Method Statements

The Principal Contractor is required to develop Risk Assessment, Standard Working Procedures (SWP) and Method Statements for each activity executed in the contract or project (Refer to Section 4. below "Project/Site Specific Requirements")

3.6 Arrangements for Monitoring and Review

3.6.1. Monthly Audit by Client

The Client will be conducting a Monthly Audit to comply with Construction Regulation 4 (1) (d) to ensure that the Principal Contractor has implemented and is maintaining the agreed approved OHS Plan.

3.6.2. Other Audits and Inspections by Client

The Client reserves the right to conduct other ad hoc audits and inspections as deemed necessary. A representative of the Principal Contractor must accompany the Client on all Audits and Inspections and may conduct his/her own audit inspection at the same time. Each party will, however, take responsibility for the results of his/her own audit inspection results.

3.6.3. Reports

The Principal Contractor is required to provide the Client with monthly report. The Principal Contractor must report all incidents where an employee is injured on duty to the extent that he/she:

- Dies
- becomes unconscious
- loses a limb or part of a limb
- is injured or becomes ill to such a degree that he/she is likely either to die, or to suffer permanent physical defect, or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he/she was usually employed OR where:
 - a major incident occurred
 - the health or safety of any person was endangered
 - where a dangerous substance was spilled
 - the uncontrolled release of any substance under pressure took place
 - machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects
 - machinery ran out of control

to the Provincial Director of the Department of Labour within seven days. (Section 24 of the Act & General Administrative Regulation 8.)

The Principal Contractor is required to provide the Client with of all statutory reports required in terms of the Act.

The principal Contractor is required to provide the Client with copies of all internal and external accident/incident investigation reports including the reports contemplated in 3.9. below.

3.6.4 Review

The Principal Contractor is to review the Hazard. Identification, Risk Assessments and SWP's at each two weekly site inspection/meeting as the construction work develops and progresses and each time that changes are made to the designs, plans and construction methods and processes.

The Principal Contractor must provide the Client, other Contractors and all other concerned parties with copies of any changes, alterations or amendments.

3.7 **Site Rules and Other Restriction**

3.7.1 Site OHS Rules

The Principal Contractor must develop a set of site-specific OHS rules that will be applied to regulate the OHS aspects of the construction.

3.7.2 Security and Emergency Arrangements

The Principal Contractor must establish site access rules and implement and maintain these throughout the construction period.

Access control must include the rule that non-employees will not be allowed on site unaccompanied.

The Principal Contractor must develop a set of security rules and procedures and maintain these throughout the construction period.

The Principal Contractor must appoint a competent Emergency Controller who must develop emergency contingency plans for any emergency that may arise on site as indicated by the risk assessments. These must include a monthly practice/testing programme for the plans e.g. January: trench collapse, February: flooding etc. and practice/tested with all persons on site at the time, participating.

3.8 **Training**

The contents and syllabi of all training required by the Act and Regulations must be included in the Principal Contractor's OHS Plan.

3.8.1 General Induction Training

All employees of the Principal and other Contractors to be in possession of proof of General Induction Training

3.8.2. Site Specific Induction Training

All employees of the Principal and other Contractors to be in possession of Site Specific OHS Induction Training.

3.8.3 Other Training

All operators, drivers and users of construction vehicles, mobile plant and other equipment to be in possession of valid proof of training.

All employees in jobs requiring training in terms of the Act and Regulations to be in possession of valid proof of training.

OHS Training Requirements: (as required by the Construction Regulations and as indicated by the OHS Specification and the Risk assessment/s):

- General Induction (Section 8 of the Act)
- Site/Job Specification Induction (also visitors) (Sections 8 & 9 of the Act)
- Site/Project Manager
- Construction Supervisor
- OHS Representatives (Section 18 (3) of the Act)
- Training of the Appointees indicated in 3.1.1. & 3.1.2. above
- Operation of Cranes (Driven Machinery Regulations 18 (11))
- Operators and Drivers of Construction Vehicles & Mobile Plant (Construction Regulation 21)
- Basic Fire Prevention & Protection (Environmental Regulations 9 and Construction regulation 27)
- Basic First Aid (General Safety Regulation 3)
- Storekeeping Methods & Safe Stacking (Construction Regulation 26) Emergency, Security and Fire Co-ordinator

3.9 Accident and Incident Investigation

The Principal Contractor is responsible for the investigation of all accidents/incidents where employees and non-employees were injured to the extent that he/she had to be referred for medical treatment by a doctor, hospital or clinic. (General Administrative Regulation 9)

The results of the investigation to be entered into the Accident/Incident Register. (General Administrative Regulation 9)

The Principal Contractor is responsible for the investigation of all non-injury incidents as described in Section 24 (1) (b) & (c) of the Act and keeping a record of the results of such investigations including the steps taken to prevent similar accidents in future.

The Principal Contractor is responsible for the investigation of all road traffic accidents and keeping a record of the results investigations including the steps taken to prevent similar accidents in future.

3.10 OHS Representatives and Committees

3.10.1 Designation of OHS Representatives

Where the Principal Contractor employs more than 20 persons (including the employees of other contractors (sub-contractors) he has to appoint one OHS Representatives for every 50 employees or part thereof. General Administrative Regulation 6 requires that the appointment or election and subsequent designation of the OHS Representative are executed in consultation with Employees Representatives or Employees. (Section 17 of the Act and General Administrative Regulation 6. & 7.)

OHS Representatives have to be designated in writing and the designation must include the area of responsibility of the person and term of the designation.

3.10.2 Duties and Functions of the OHS Representatives

The Principal Contractor must ensure that the designated OHS Representatives conduct a minimum monthly inspection of their respective areas of responsibility using a checklist and report thereon to the Principal Contractor.
OHS representatives must attend all OHS committee meetings.

3.10.3 Appointment of OHS Committee

The Principal Contractor must establish an OHS Committee consisting of all the designated OHS Representatives together with a number of management representatives (this number is

not to exceed the number of OHS representatives on the committee) and a representative of the Client who shall act as chairperson without a vote. The members of the OHS committee must be appointed in writing.

The OHS Committee must meet minimum monthly and consider, at least, the following Agenda:

- Opening and welcome
- Minutes of previous meeting
- Matters arising from the previous minutes
- OHS Representatives Report
- Incident/Injury statistics
- Other matters
- Endorsement of Registers and the statutory documents by a representative of the Principal Contractor
- Close/Next Meeting

4. **PROJECT/SITE SPECIFIC REQUIREMENTS**

The following is a list of specific activities and considerations that have been identified for the project and the construction site and for which Risk Assessments, Standard Working Procedures (SWP), management and control measures and Method Statements (where necessary) have to be developed by the Principal Contractor:

- Clearing & Grubbing of the Area/Site
- Site Establishment including:
 - Office/s
 - Secure/safe storage for materials, plant & equipment Ablutions
 - Facilities for Employees
 - Maintenance workshop
 - Vehicle access to the site
- Location of existing services
- Installation and maintenance of temporary construction electrical supply, lighting and equipment
- Adjacent land uses
- Boundary and access control/Public Liability Exposures (NB: the Employer is also responsible for the OHS of non-employees affected by his/her work activities.)
- Health risks arising from neighbouring as well as own activities and from the environment e.g. threats by bogs, bees, snakes, lightning etc.
- Exposure to noise
- Exposure to vibration
- Protection against dehydration and heat exhaustion
- Protection from wet & cold conditions
- Dealing with HIV/Aids and other diseases
- Use of Portable Electrical Equipment including
 - Angler grinder
 - Electrical drilling machine
 - Skill saw
- Excavations including
 - Ground/soil conditions
 - Trenching
 - Shoring
 - Drainage of trench
- Welding including
 - Arc Welding
 - Gas welding
 - Flame cutting
 - Use of LP gas torches and appliances
- Loading & offloading of trucks
- Aggregate/sand and other materials delivery
- Manual and mechanical handling

- Lifting and lowering operations
- Driving & operation of construction vehicles and mobile plant including
 - Trenching machine
 - Excavator
 - Bomag roller
 - Pedestrian Roller
 - Plate compactor
 - Front end loader
 - Mobile cranes and the ancillary lifting tackle
 - Parking of vehicles & mobile plant
 - Towing of vehicles & mobile plant
- Use and storage of flammable liquids and other hazardous substances
- Layering and bedding of trench floor
- Installation of pipes in trench
- Pressure testing of pipeline
- Installation heat shrink joint sleeves
- Backfilling of trench
- Protection against flooding
- Gabion work
- Use of explosives
- Protection from overhead power lines
- As discovered by the Principal Contractor's hazard identification exercise
- As discovered from any inspections and audits conducted by the Client or by the Principal Contractor or any other Contractor on site
- As discovered from any accident/incident investigation

RISK ASSESSMENT: SITE ESTABLISHMENT

TYPE OF WORK PERFORMED BY: _____ / _____ / _____ Date Completed: _____ / _____ / 20_____

ASSESSMENT PERFORMED:

Step No.	Activity Rules	What can cause injury / damage?	Results of causes (injury / damage)	Preventive Measures (tools, PPE, equipment)	Controls (test, check list)	Weights	
						Safety	Health R/R
1.	Access to be a main consideration when positioning offices, stores and parking areas on site during planning stage. Possible one way traffic to be introduced	Restricted access to parking and delivery areas to storage areas	Damage to transport and plant	Proper layout of site by Construction Manager and Site Agent taking into consideration all transport plant and material movements and storage on site	Site Agent to check layout DRG. To compare with OHS Act requirements and whether they are to Concor's standards.		
2.	Oxygen and acetylene store to be a minimum distance of five metres away from other buildings, it needs to be well ventilated and have a roof to keep direct exposure to the sun.	Fire explosion leaking gas may spread if to close to other buildings.	Damage to property and Health of employees.	See item 1.	See item 1		
3.	Diesel tanks to be a distance of 10 metres away from any building and parking areas. A slab with a bund wall capable of carrying 110% of the tank capacities must be constructed for the tanks to stand in.	Fire may spread to adjacent buildings and plant if is too close.	Burns on all parts of body. Damage to plant and property.	See item 1. Person in charge of tanks should be inducted regarding all the hazards involved and how to control them.	See item 1. Supervisor to monitor on an ongoing basis if rules are complied with.		
4.	All cables from distribution board to offices, store and for security to be under-ground. The distribution board is to stand on a firm level base and should be locked at all times.	Damaged cables loose wires exposed.					
5.	Security fencing minimum height of 1.8 metre around site area together with two double gates.	Theft of property. Access to unauthorised persons.	Loss of property. Injury to persons.	Security guards to be appointed to keep watch.	Supervisor to put system of control in place		
6	Services to be available during site establishment.	Not having the essential services at hand.	Health of employees. Loss of property through fire.	6.1 to 6.5 are to be included on first order placed for contract. Dry chemical powder ABCDE fire extinguishers to be ordered 4 off for start.	Site Agent to see that these requirements are on site from start of site establishment.		
6.1	Fire fighting equipment.						
6.2	First aid boxes.						
6.3	First aider						
6.4	Drinking Water						
6.5	Toilets.						

7.	Water tank tower to consist of very well cross braced pipe structure standing on concrete base.	Badly constructed water tower under designed structurally could cause collapse.	Injury to persons. Damage to property.	Supervisor to erect as per design office specifications.				
8	Safety sign & notice board to be placed close to entrance of main gate.	Not informing employees and public what the site rules are.	Injury to persons. Damage to property.	Concor standard notices. Posters to be displayed. Available form Head Office.	Site manager to check that board has been erected.			
9.	Lay down areas to be sufficient in size. Timber poles to be available to stack materials on.	With inadequate space various materials will be stacked on top of each other causing unstable stacks.	Injury to persons loading, unloading materials.	Allow sufficient space for laydown area during planning stage of site layout. Access to be considered important.	Site agent to discuss with Foreman regarding his requirement at planning stage.			
10	Toilets are to be well ventilated.	No ventilation in toilets may cause germs to propagate.	Possible health problems due to germs.	Extraction fans to be fitted if required.	Supervisor to check if he is satisfied with ventilation.			

RISK ASSESSMENT: EXCAVATION (PLANT & MAUAL)

TYPE OF WORK PERFORMED BY: _____ Date Completed: _____ / _____ / 20

ASSESSMENT PERFORMED: _____

Step No.	Activity Rules	What can cause injury / damage?	Results of causes (injury / damage)	Preventative Measures (tools, PPE, equipment)	Controls (test, check list)	Weights		
						Safety	Health	Finan.
1.	When using a machine to excavate, observe the following Operator must ensure there are no employees working in this area	Employees not visible to operate or moving machines.	An injury to all parts of the body as well as more serious fatal injuries.	Operator must work under close supervision. He must inspect the work area prior to commencing work.	Supervisor to ensure employees are informed and operator works under his supervision.			
2.	Machine not to operate while employees are working in the same excavations.	Danger of injury of employee by machine.	Bruises, scratches, fractures and fatal.	Supervisor must instruct operator when to commence work.	Supervisor to control and enforce procedure.			
3.	All excavated materials must be discharged not closer than 2m from the edge of the excavation.	Materials can fall onto employees and the excavation may need extra work	Injuries to employees and the excavation may need extra work.	Supervisor must instruct operator where to place discharged soil and gravel.	Supervisor to control			
4.	Using a pick and a shovel.	Unsafe use of a pick or a shovel.	Injury to employees.	Induct employees on safe working procedures.	Supervisor and charge hand to control.			
5.	Check sides of excavations.	Unstable / loose material causes unsafe conditions.	Injury to employees and damage to excavations.	Supervisor to inspect sides on a regular basis.	Supervisor / chargehand to control.			
6.	Excavated material to be placed away from side of excavation.	Materials can fall onto employees when working inside the excavation.	Bruises, scratches, fractures and fatal.	Employees to be instructed not to place loose soil on edge of the excavation.	Supervisor to control.			
7.	All excavations deeper than 1.5m must have an access ladder available for employees to get into and out of the excavation safely.	Employees not able to enter or exit the excavation safely.	In case of an emergency too many employees may be buried as a result of inadequate access. Employees may also strain muscles to get into or out of an excavation without safe and convenient access.	Providing a ladder makes access into and out of the excavation area easy and safe.	Supervisors to ensure employees are given safe and convenient access to excavations.			
8.	Sides of excavation to be shored (if necessary) and barricaded immediately.	Sides may collapse. Employees may NOT BE AWARE OF THE EXCAVATION AND FALL INTO IT.	Damage to the excavation. Injury to employees.	Put adequate shoring and strong physical barricades in place immediately.	Supervisor and chargehand to control.			
9.	Excavations must be backfilled as soon as possible after excavations.	Excavations could collapse. Employees could trip and fall in. Vehicles and machinery could damage excavations.	Damage to excavations. Injury to employees. Damage to plant and machinery.	Keep area barricaded with a strong physical barricade and backfill as soon as possible.	Supervisor and chargehand to control.			

C3.6: MANAGEMENT

Planning and programme

The Contractor shall deliver to the Engineer within 14 days, calculated from the commencement date, a realistic programme showing the order of procedure, the duration of activities making up the programme and method which he proposes to use in carrying out the Works in order to meet the due completion date for this project.

The programme referred to in Clause 5.6 of the GCC shall be a network-based programme in accordance with the precedence method; a detailed cash flow graph indicating projected monthly invoice amounts shall also be provided. The critical path of the program of work shall be clearly indicated and the program monitored continually and updated monthly by the Contractor in accordance with his progress.

1. In compiling the program of work, the Contractor shall incorporate the following important specific requirements and constraints:
 - (a) The identification and marking of affected services prior to commencing construction works.
 - (b) The requirements of the Environmental Management Plan (EMP) as specified in the relevant sections of the Particular Specifications and the requirements in respect of inspections and community liaison.
 - (c) The requirements of the Occupational Health Safety (OHS) Act of 1993, the Construction Regulations, 2003 and part C.3.6 hereof.
 - (d) An allowance to accommodate normal rain and other adverse weather days.
 - (e) The recorded water table in certain parts of the site and a requirement to make timeous arrangements in this regard to enable the permanent work to proceed in an orderly manner.
2. The work shall be completed within the stipulated time frame. Identified sections may be required for Practical Completion so as to allow occupation and use by the Employer, his agents, employees or other contractors for the purpose of undertaking Mechanical, Electrical and Instrumentational (M,E&I) work required for the completion of the project. It is also to allow for testing and commissioning of the plant. The Contractor is to prepare his works program to reflect such.
3. The program submitted shall include at least the following details:
 - (a) A work breakdown structure identifying the major activity groups.
 - (b) For each activity group further details shall be provided with regard to the start and end dates of each group as identified or as shown on the drawings. Ancillary works not separately identified shall be included with the nearest identified Portion.
 - (c) The critical path shall be indicated and floats on non-critical activities shall be shown.
 - (d) The working hours per day, week and month allowed for in the program with details of resource allocations per activity.
 - (e) Production rates for key activities e.g. excavate and place, concrete work, pipe laying etc.
4. In addition the Contractor shall submit to the Engineer at monthly intervals a progress report indicating the following details:
 - (a) Work completed in previous month and total progress to date, per activity.
 - (b) Activities behind program, for which the Contractor shall detail all reasons for such delays as well as the measures to be implemented to make up delays.
 - (c) A GANTT chart showing the original program, the latest approved version of the program, actual progress achieved and revised completion dates, if and when applicable.

Failure to comply with all of the foregoing requirements shall entitle the Engineer to use a program based on his own assumptions to evaluate claims for extension of time for completion of the works, or for additional compensation.

- Setting out of the works

The Engineer has established the position of the permanent benchmarks on all relevant drawings. The Contractor shall be responsible for the setting out these benchmarks after award of the Contract and the setting task shall be performed by a registered land surveyor.

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

If at any time during the progress of the Works, any error shall appear or arise in the position, levels, dimensions or alignment of any part of the Works, the Contractor, on being required to do so by the Engineer, shall at his own expense rectify such error to the satisfaction of the Engineer.

The Contractor shall take special precautions to protect all survey beacons or pegs such as benchmarks, stand boundary pegs and trigonometrical beacons, regardless whether such beacons or pegs were placed before or during the execution of the Contract. If any such beacons or pegs have been disturbed by the Contractor or his employees, the Contractor shall have them replaced by a registered land surveyor at his own cost.

Survey markers shall be white stakes and lime must be used for markers on the ground. Painting or marking of natural features shall not be permitted under any circumstances.

- Excavation of works & safety

The contractor shall ensure that all excavation work is carried out under the supervision of a competent person who is been appointed in writing. The Contractor will evaluate, as far as is reasonably practicable, the stability of the ground before excavation works begin and he/she shall not permit any person to work in an excavation which has not been adequately shored or braced.

The Contractor will cause convenient and safe means of access to every excavation area in which person are required to work and such access shall not be further than 6m from the point where any worker within the excavation is working.

The Contractor must ascertain as far as is reasonably practicable the location and nature of electricity, water, gas or other similar services which may in any way be affected by the work to be performed, and shall before the commencement of excavation work that may affect any such service, take the steps that may be necessary to render the circumstances safe for all persons involved;

The Principal Contractor shall cause every excavation which is accessible to the public or which is adjacent to public roads or thoroughfares, or whereby the safety of persons may be endangered, to be:

- (i) adequately protected by a barrier or fence of at least one metre in height and as close to the excavation as is practicable; and
- (ii) provided with warning illuminants or any other clearly visible boundary indicators at night or when visibility is poor;

The Principal Contractor shall cause warning signs to be positioned next to an excavation within which persons are working or carrying out inspections or tests.

- Inspection by engineer

No stage of construction shall be proceeded with until the Engineer or his representative has examined and approved the previous stage. If any work is covered or hidden from view before the Engineer has inspected same, the Contractor shall at his own cost open the covered work for inspection. The Contractor shall also be responsible for making good any work damaged by such uncovering.

- Employment of local labour

It is a specific criterion of this project that should as far as possible adhere to RDP principles, and to meet these principles the following procedures will be followed:

All labour is to be sourced from the Local area of jurisdiction and the Contractor may only bring in key personnel from outside this area. The Contractor's attention is drawn to the standard rates specification ("Annexure A" – Civil Engineering Industry Minimum Wage rates per hour; (Latest **Wage** Schedule) found on the SAFCEC website at www.safcec.org.za. These standard rates should be implemented for payment of all employees of the Contractor.

Key personnel would typically include the Contracts Manager, Site Agent, and Supervisor for each discipline, and operators of plant where the operator must be seated.

A Monthly labour report on all local labour i.e. payments and labour days should be submitted to the Engineer at the end of each month in order for the Engineer to submit a report to the Employer.

None of the Works shall be executed except between sunrise and sunset on Monday to Saturday, inclusive, of any week, and none of the Works shall be executed on any special non-working days stated in the Contract Data, unless:

The Engineer's permission in writing is obtained, subject to such conditions as may be laid down by the Engineer; or
Provision is specifically made for it in the Contract; or
Work is unavoidable or necessary for the saving of life or property or for the safety of the Works.

- Site Meetings

Regular meetings will be held between all relevant parties to establish the progress and / or delays and problems that might occur on site. Any problems of delays will be addressed accordingly and the Contractor will receive proper instructions with reference to this matter.

- Site Instruction

All site instructions will be issued by the Engineer in writing, which will be recorded in the site instruction book (in triplicate) provided by the Contractor. This site instruction book shall be kept in safe custody and be available at all times during the construction period. No oral instruction, objection, claim or notice by any party to the others shall affect or modify any clause in this contract. It is also understood that it will not modify or waive any of the specifications of this contract.

- Communication

The Engineer's representative on this project will be: Mr W Ndlovu Contact No: 072 517 4558

- Daily Records

Daily records of resources (equipment and people employed) must be kept and must be available on site at all times. These records will include i.e. site instruction book, site diary, site visit register, contractual documentation and minutes of all project meetings. Labour information should be kept updated at all times.

- Rainfall Records

Rainfall records for the period of construction shall be taken on Site and recorded in the daily site diary. The Contractor shall provide and install all the necessary equipment for accurately measuring the rainfall in the work areas. The Engineer or his Representative shall take and record the daily rainfall readings. The Contractor shall be permitted to attend these readings, in the company of the Engineer's Representative. Access to the measuring gauge(s) shall at all times be under the Engineer's control.

- Compliance with applicable laws

The Contractor shall, in performance of the Contract, comply with all applicable laws, regulations and statutory provisions and agreements, and shall in particular, on the request of the Engineer, provide proof that he has complied therewith with regard to amongst others:

- ✓ Wages and conditions of work; and
- ✓ Safety

▪ Payment Certificates

As consideration for the construction, completion and defects correction of the Works, the Employer shall pay the Contractor in terms of the provisions of the Contract.

▪ Clearance of site

On completion of the Works, the Contractor shall clear away and remove from the site all Construction Equipment, surplus materials, rubbish and temporary works of every kind and leave the whole of the site and the works clean and in a safe condition. All streams and watercourses (where applicable) shall be cleaned and restored to the condition as at the commencement of the Works. If the Contractor does not, within a reasonable time, comply with this requirement, the Employer may have the site cleared and recover the cost thereof from the Contractor.

▪ Termination of Contract

If application is made for the sequestration of the Contractor's estate, or if the Contractor publishes a notice of surrender of his estate or presents a petition for the acceptance of 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 purposes 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 if the Engineer certifies reference to this Clause, that in his opinion the Contractor:

▪ Has abandoned the contract; or

Without reasonable excuse, has failed to commence the Works in terms of Clause 10 of the General Conditions of Contract for Construction Works (2015), or has suspended the progress of the Works for twenty one (21) days after receiving from the Engineer written notice to proceed or
Has failed to proceed with the Works with due diligence; or
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 Engineer in terms of these conditions; or
Is not executing the Works in accordance with the Contract, or is neglecting to carry out his obligations under the Contract; or
Has, to the detriment of good workmanship or in defiance of the Engineer's instruction to the contrary, sublet any part of the Contract; or
Has assigned the Contract or any part thereof without the Employer's consent in writing; or
The contractor or anyone on his behalf or in his employ would pay, offer or offer as payment to any person in the employ of the Employer a gratuity or reward or commission; or
The contractor furnished inaccurate information in the Schedules forming part of this Contract.

Then the Employer may, after giving fourteen (14) days' notice in writing to the Contractor, terminate the Contract and order the Contractor to vacate the Site and to hand it over to the Employer, and the Employer may then enter upon the site and the Works and expel the Contractor there from without thereby affecting the rights and powers conferred on the Employer of the Engineer 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 bought 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 toward 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 of this Contract.

C 3.6.1 QUALITY MANAGEMENT

1. General

The Contractor's Quality Management System shall include quality management objectives, policies, organization, procedures and work instruction that comply with the requirements of ISO 9001/2000.

2. Project Quality Plan

The Contractor shall within 21 days from the commencement date submit a Project Quality Plan for the Contract. The Plan shall indicate how the Quality System shall apply to the specific requirements of the Contract to ensure compliance of the Works with the requirements of the Specifications. The Project Quality Plan shall be subject to the approval of the Engineer.

3. Quality Control Plans

Quality Control Plans shall be prepared by the Contractor and/or his subcontractors for each group of activities. Where applicable, approved plant, equipment or services required to realize the specific component shall be included.

Quality Control Plans shall be submitted to the Engineer for approval and for the inclusion of his construction monitoring activities before any construction of the permanent works may commence.

The following surveillance requirements shall be included for affirmation by the Engineer or his representative.

Record (R)	Documentary evidence of the activity and statistical analysis of the data to be retained and copied to the Engineer.
Verification(V)	The Engineer or his representative will not necessarily be present during the activity but documentary evidence to permit verification of compliance with the requirements is generated, retained and copied to the Engineer.
Witness (W)	The Engineer or his representative requires notification to permit witnessing of the activity. The notice period shall be agreed to depending on the nature of the activity and shall be reviewed from time to time. Documentary evidence shall be retained and copied to the Engineer.
Hold (H)	The Contractor may not proceed to the following activity until the Engineer or his representative has approved the proceeding activity. Documentary evidence shall be retained and copied to the Engineer.
Random (R)	Construction monitoring by random inspection. Random construction monitoring may be carried out at any stage of the activity or preparation for the activity. Documentary evidence shall be retained and copied to the Engineer.

4. Categorisation

The following categories shall apply in determining the requirement for a Quality Control Plan

Category	Clarification	Quality Control Plan
Critical	A component, group of components, structure, and the failure of which to comply with the specifications may affect the performance of the works of which it is a part and /or will cause a detrimental environmental impact, and /or may result in hazardous or unsafe conditions.	Required for all components.
Major	A component, group of components, structure, element of a structure or facility, other than categorized as critical, the failure of which to comply with the specifications may compromise the performance of the works of which it is a part, result in increased, maintenance and/or impact negatively on the quality of the works.	As determined by the Contractor and to the approval of the Engineer.
Minor	All items other than those categorized as Critical or Major and which are visible and capable of rectification during routine inspections.	As determined by the Contractor

5. Quality Management Audit

The Contractor shall carry out periodic assessments of the adherence to the Quality Plan and Quality Control Plans by senior qualified staff who are not normally employed on the Site. The Engineer and/or his representative shall be invited to attend at the periodic assessments meeting and be afforded the opportunity to report on the implementation of the Quality System at the Site. The assessment reports shall be copied to the Engineer.

6. Corrective Action

Failure to conform to the specified requirements will result in the issue by the Engineer of a Corrective Action Request. Failure to rectify the deficiencies covered by a Corrective Action Request within the period stated will result in the Engineer invoking the provisions of GCC Clause 7.6.3 – Removal of Improper Work and Materials.

C 3.6.2 ENVIRONMENTAL MANAGEMENT DURING CONSTRUCTION

The contractual requirements for environmental management are comprehensively set out in Section C3.5.9.1 Environmental management during construction.

C 3.6.3 OTHER CONTRACTORS ON SITE

1. Facilities for Others

The facilities for others contemplated under this clause and for which compensation to the Contractor is paid for under scheduled items of the Bill of Quantities and for which no additional payment will be due are:

- (a) Ensuring unobstructed access to the Employer and other contractors, to the completed Portions of this Contract by timeously removing all temporary works, which if not removed, would prevent or hamper access to those portions of the site.
- (b) Leaving in place temporary roads and ramps for access by the Employer and other contractors.

PART C4: SITE INFORMATION

Annex A : Locality Plan

Annex B : Tender Drawings

C4 SITE INFORMATION

C4.1 Site Location

The proposed township development is situated next to Kamhlushwa A with grid reference 25°40'36.07"S; 31°41'15.70"E

C4.2. Road Access to the Site

The site can be accessed via R570 and R571 from the West and East respectively.

C4.3 Climatic Conditions

The following climatic and general conditions should be expected at the Site and the specified capacities and performance of all equipment provided under this Contract shall be suitable to operate continuously or intermittently if so specified, under these conditions.

Temperature: Maximum ambient: 40°C

Minimum ambient: 5°C

24hr maximum: 35°C

Altitude 300 m (meters above mean sea level) (Varies across all sites)

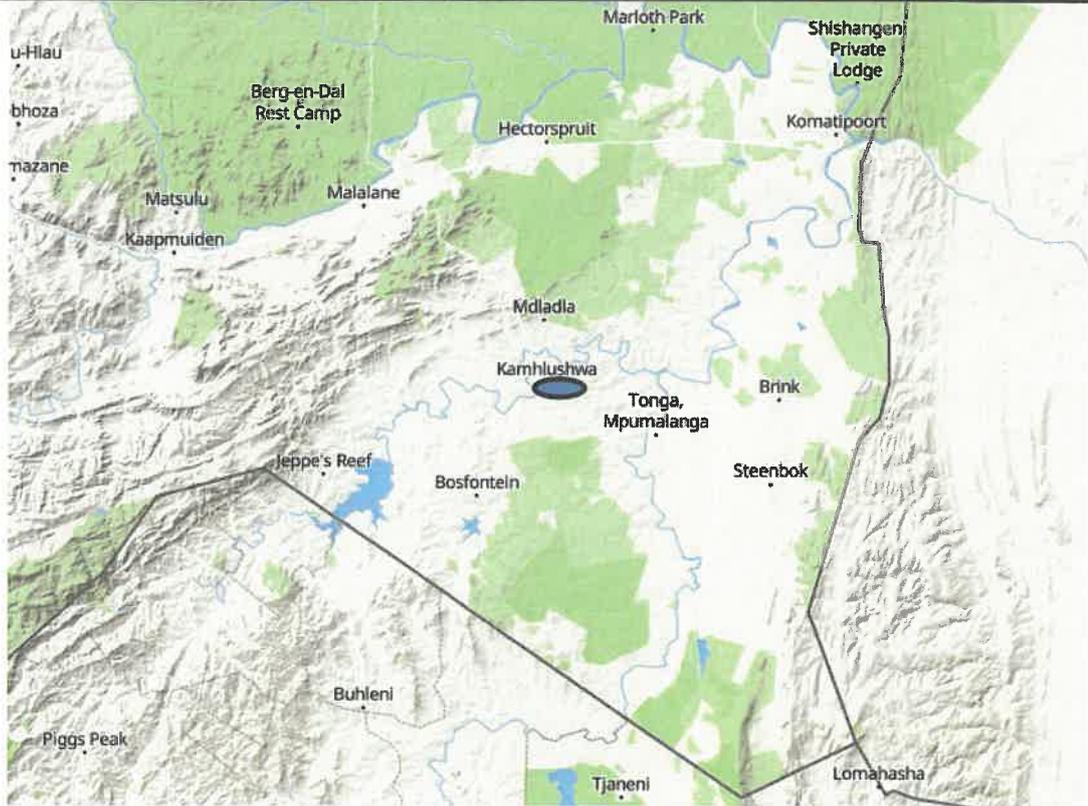
Humidity: Up to saturation point

Atmosphere: Ambient air may contain high dust content

Solar: Lengthy periods of sunshine cause high temperature in outdoor enclosures. High breakdown occurrence due to effect of ultra violet rays on outdoor synthetic materials

Lightning: High lightning rate.

PART C4 ANNEX A: LOCALITY PLAN



List of drawings:

The Engineer will provide the Contractor with one full set of drawings, which will be used exclusively for the recording of as built information by the Contractor.

Only dimensions, positions, levels, co-ordinates etc. that change from the original values, will be required to be entered on these drawings. These drawings, fully marked up, will be handed to the Engineer at the issue of the Certificate of completion, which will not be issued until the as-built information has been received.

Civil Engineering drawings

- Water layout drawings
- Water typical drawings
- Sewer layout drawings
- Seer Pum Station Drawings
- Sewer long section profile drawings
- Sewer typical drawings
- Road and stormwater layout drawings
- Road long section profile drawings
- Typical road drawings
- Typical stormwater drawings

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (R)
		SECTION 1:PRELIMINARY AND GENERAL				
1.1	SANS 1200 A	<u>FIXED-CHARGE ITEMS</u>				
1.1	8.3.1	Contractual Requirements	Sum	1		
1.2.1	8.3.2	Establish Facilities on the Site :				
	8.3.2.2	Facilities for Contractor				
1.2.1.1		a) Offices and storage sheds	Sum	1		
1.2.1.2		b) Workshops	Sum	1		
1.2.1.3		c) laboratories	Sum	1		
1.2.1.4		d) Living accomodation	Sum	1		
1.2.1.5		e) Ablution and latrine facilities	Sum	1		
1.2.1.6		f) Tools and equipment	Sum	1		
1.2.1.7		g) Water supplies, electric power and communications	Sum	1		
1.2.1.8		h) Dealing with water (Subclause 5.5)	Sum	1		
1.2.1.9		f) Access (Subclause 5.8)	Sum	1		
1.2.1.10		j) Plant	Sum	1		
		Facilities for Engineer				
1.2.1.11		a) Furnished offices	m ²	80		
1.2.1.12		b) Telecommunication Services	Sum	12		
1.2.1.13		c) Name boards (2No.)	No.	1		
1.2.2	PSA 2.3	Other fixed-charge obligations	Sum	1		
1.2.3	8.3.4	Remove Contractor's Site establishment on completion	Sum	1		
1.2.4	PSA8.9	Compliance with Health & Safely including Covid 19 regulations	Sum	1		
1.2.5		Compliance with Enviromental Management Plan	Sum	1		
1.3	PSA 2.3 c	TIME-RELATED ITEMS				
1.3.1	8.4.1	Contractual Requirements	Month	36		
	8.4.2	Operate and maintain facilities on the Site:				
	8.4.2.2	Facilities for the Contractor for duration of construction, except where otherwise listed				
1.3.2.1		a) Offices and storage sheds	Month	36		
1.3.2.2		b) Workshops	Month	36		
1.3.2.3		c) Laboratories	Month	36		
1.3.2.4		d) Living accomodation	Month	36		
1.3.2.5		e) Ablution and latrine facilities	Month	36		

1.3.2.6		f) Tools and equipment	Month	36		
1.3.2.7		g) Water supplies, electric power and communication	Month	36		
TOTAL CARRIED FORWARD						-
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (R)
TOTAL BROUGHT FORWARD						-
1.3.2.8		h) Dealing with water (Subclause 5.5)	Month	36		
1.3.2.9		i) Access (Subclause 5.8)	Month	36		
1.3.2.10		j) Plant	Month	36		
1.3.3	8.3.4	Supervision for duration of construction per month	Month	36		
1.3.4	8.4.4	Company and head office overhead costs for duration of contract	Month	36		
1.3.5	8.4.5	Other time related obligations	Month	36		
	SANS 1200 A					
1.4	8.5	SUMS STATED PROVISIONALLY BY ENGINEER				
1.4.1.1		a) Additional Tests Required by the Engineer	Prov. Sum	1	400,000.00	400,000.00
						-
						-
1.4.1.4		b) Provision for 2 x Trainee Technicians/ Students	Prov. Sum	1	720,000.00	720,000.00
1.4.1.5	SDA8-9	Relocation of existing services where required	Prov Sum	1	100,000.00	100,000.00
1.4.1.7		Allow for repairs to damaged / unknown services which could not have been reasonably foreseen or prevented by the contractor	Prov Sum	1	20,000.00	20,000.00
1.4.1.8	PS.25	Allow for the employment of the Community Liaison Officer	Prov Sum	1	360,000.00	360,000.00
1.4.1.12		Allow for as-built survey to include line and invert levels as ordered by the Engineer	Prov Sum	1	150,000.00	150,000.00
1.4.1.14		Allow a provisional sum for taking and submitting progress photographs during the Contract	Prov Sum	1	50,000.00	50,000.00
1.4.1.16		Contractors markup on the above item	%			-
1.4.1.6		c) Time-related obligations for Health and Safety file and the Health and Safety plan, and for full compliance with all Health and Safety	Month	36		
1.5.2.3						
		OVERHAUL				
1.6		Overhaul on material hauled in excess of a free-haul	KMm³	500		
1.6.1		Overhaul on material hauled in excess of 1.0km (ordinary overhaul)	m³-km	350		
1.6.2						
		Provision for Sub Consultants				
1.6.3						
1.6.3.1		Provisional Sum for monitoring of Occupational Health & Safety and full compliance with all Health and Safety Regulations (OHS Agent)	Prov Sum	1	720,000.00	720,000.00

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1.6.3.3		Contractors markup on the above item	%			-
TOTAL CARRIED FORWARD						
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (R)
TOTAL BROUGHT FORWARD						
A7		DAYWORKS				
A7.1		Personnel during normal working hours				
		(a) Unskilled labour	hr	60		
		(b) Semi-skilled labour	hr	60		
		(c) Skilled labour	hr	60		
		(d) Ganger	hr	60		
		(e) Flagmen	hr	60		
A7.2		Personnel outside normal working hours				
		(a) Outside normal working hours and Saturdays				
		(i) Unskilled labour	hr	45		
		(ii) Semi-skilled labour	hr	45		
		(iii) Skilled labour	hr	45		
		(iv) Ganger	hr	45		
		(v) Flagmen	hr	45		
A7.3		(b) Sundays and public holidays				
		(i) Unskilled labour	hr	42		
		(ii) Semi-skilled labour	hr	50		
		(iii) Skilled labour	hr	40		
		(iv) Ganger	hr	40		
		(v) Flagmen	hr	40		
A7.4		Plant				
		(i) Excavator Tracked 80 to 200 kW with up to 2m ³ load capacity	hr	1		
		(i) Backhoe loader 55-70 kW 0.5m ³ bucket	hr	20		
		(b) Pedestrian Roller (Bomag BW 90 or similar)	hr	20		
		(c) Water truck (5000 litres)	hr	20		
		(d) Tipper truck, 10.0 m ³	hr	20		
		(e) Backhoe TLB type (Cat 428 or equivalent)	hr	20		
		(f) Dewatering pump including generators and accessories (50 mm pump, 600 litres per minute)	hr	20		
		(g) Compressor including hoses and tools (180cfm)	hr	20		
TOTAL CARRIED FORWARD TO SUMMARY						

KAMHLUSHWA BULK SERVICES ROADS AND STORMWATER BOQ

Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 1500				
	ACCOMMODATION OF TRAFFIC				
B15.01	Accommodating traffic and maintaining temporary deviations	km	20		
B15.03	Temporary traffic control facilities				
(a)	Flagman	day	4000		
(b)	Portable STOP and GO-RY signs	N°	20		
(e)	Road signs, R-and TR-series, (1200mm diameter)	N°	30		
(f)	Road signs, TW-series	N°	20		
(g)	Road signs, STW-, DTG-, TGS- and TG-series (excluding delineators and barricades)	N°	30		
(h)	Delineators (DTG50J) (200mm x 800mm)				
	1 Single	N°	20		
	2 Mounted back to back	N°	20		
(j)	Traffic cones (500mm)	N°			
(l)	Movable barriers (Water filled 2000mm x 1000mm high)	N°	10		
15.05	Graveling and repair of temporary deviations and existing gravel shoulders used as temporary deviations				
(b)	Existing gravel shoulders	m³	3000		
15.06	Watering of temporary deviations	kl	3500		
Carried forward to Summary of Schedules					-

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Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 1600				
	OVERHAUL				
	Restricted overhaul				
16.01	Overhaul on material hauled in excess of a free haul distance of 5km, for haul up to or through 10,0 km	m³	2,000		
	Ordinary overhaul				
16.02	Overhaul on material hauled in excess of 10,0 km	m³/km	3,000		
Carried forward to Summary of Schedules					-

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE

Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 1700 CLEARING AND GRUBBING				
17.01	Clearing and grubbing	ha	24		
17.02	Removal and grubbing of large trees and tree stumps:				
	(a) Girth exceeding 1m up to and including 2m	N°	10		
17.06	Removal and storage of selected vegetation:				
	(a) Cost of removal, storing, protection and replanting in a protected and fenced area of selected vegetation	Prov Sum	1	30,000.00	30,000.00
	(b) Charges on provisional sum	%			-
	REMOVAL OF EXISTING SERVICES				
	Dismantle remove and spoil, relocate pipelines, powerlines, cables, etc (excavation and removal of concrete, etc measured elsewhere)				
	(a) Water pipelines of all diameters	Prov Sum	1.0	10,000.00	10,000.00
	(b) Electrical services (Eskom, Fibre, etc.)	Prov Sum	1.0	180,000.00	180,000.00
Carried forward to Summary of Schedules					

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Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 2100 DRAINS				
21.01	Excavation for open drains:				
	(a) Excavating soft material situated within the following depth ranges below the surface level:				
	(i) 0m up to 1,5m	m³	4500		
	(ii) 1,5 m up to 3m	m³	1500		
	(b) Extra over subitem 21.01(a) for excavation in hard material, irrespective of depth	m³	1550		
21.02	Concrete lining for open drains (with reinforcing mesh 395 centrally placed and sealed surface joints)				
	(a) Cast in situ concrete lining (class 20/19) for open v drains	m³	1200		
21.03	Excavation for subsoil drainage system				-
	(a) Excavating soft material situated within the following depth ranges below the surface level:				-
	(i) 0m up to 1,5m	m³	1200		-
	(ii) 1,5m to 3m	m³	800		-
	(b) Extra over item 21.03(a) for excavation in hard material irrespective of depth	m³	430		-
21.04	Impermeable backfilling to subsoil drainage systems:				-
	(a) Unstabilised natural gravel	m³	450		-
	(b) Soilcrete	m³	115		-
21.06	Natural permeable material in subsoil drainage systems (crushed stone):				
	(b) Crushed stone obtained from commercial sources Grade A	m³	300		
21.07	Natural permeable material in subsoil drainage systems (sand)				-
	(a) Sand obtained from approved sources on site (river sand)	m³	125		-
21.08	Pipes in subsoil drainage systems:				
	(b) Normal duty uPVC pipes and fittings complete with couplings				
Total Carried Forward					-

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Section	Description	Unit	Qty	Rate (R)	Amount (R)
Total Brought Forward					-
	Perforated pipes				
	(v) 160mm Diameter perforated pipe	m	2800		
21.1	Synthetic-fibre filter fabric				
	(ii) Bidim U24	m ²	3000		
21.12	Concrete outlet structures, manhole boxes, junction boxes and cleaning eyes for subsoil drainage systems:				
	(a) Outlet structures	N ^o	10		
	(b) Manhole boxes	N ^o	14		
	(c) Junction boxes	N ^o	18		
	(d) Cleaning eyes	N ^o	20		
21.13	Concrete caps for subsoil drainpipes	N ^o	6		
21.14	Repairing or replacing existing drainage systems	Prov Sum	1		
21.15	Overhaul for material hauled in excess of 1,0 km free haul (normal overhaul)	m ² /km	5000		
21.19	Selected backfill material under concrete lined side drains compacted to 93% mod AASHTO density	m ³	5		
Carried forward to Summary of Schedules					-

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Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 2200				
	PREFABRICATED CULVERTS				
22.01	Excavation:				
	(a) Excavating soft material situated within the following depth ranges below the surface level:				
	(i) 0m up to 1,5m	m³	250		
	(ii) 1,5m up to 3m	m³	80		
	(iii) Exceeding 3,0m and up to 4,5m	m³	30		
22.01	(b) Extra over subitem 22.01(a) for excavation in hard material irrespective of depth	m³	70		
22.02	Backfilling:				
	(a) Using the excavated material	m³	150		
	(b) Using imported selected material	m³	20		
	(c) Extra over subitem 22.02(a)&(b) for soil cement backfilling with (5% OPC)	m³	60		
22.03	Concrete pipe stormwater drains:				
	(b) On class B bedding				
	(i) 900mm Ø type IJ Class 100D	m	4000		
	(ii) 750mm Ø type IJ Class 100D	m	1000		
	(iii) 600mm Ø type IJ Class 100D	m	1000		
22.05	Portal and rectangular culverts:				
	(b) Without prefabricated floor slabs				
	(i) 2000mm x 1500mm Class 75S	m	90		
	(ii) 3000mm x 3000mm Class 75S	m	45		
22.07	Cast in situ concrete and formwork:				
	(a) In class A bedding, screeds, and the encasing for pipes, including formwork				
	(i) Class 15/19				
	(i) Bedding	m³	82		
	(ii) Pipe encasement	m³	126		
Total Carried Forward					

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Section	Description	Unit	Qty	Rate (R)	Amount (R)
Total Brought Forward					-
	(b) In floor slabs for portal or rectangular culverts, including formwork, joints and class U2 surface finish				
	(i) Class 25/19				
	(i) Floor slabs	m ³	198		
	(c) In inlet and outlet structures, skewed ends, catchpits, manholes, thrust and anchor blocks excluding formwork but including class U2 surface finish				
	(i) Class 25/19				
	(i) Inlet structures	m ³	170		
	(ii) Outlet structures	m ³	84		
	(d) Formwork of concrete under subitem 22.07(c) above				
	(i) Class F2 (smooth finish)				
	(i) Horizontal				
	(ii) Head wall soffit	m ²	180		
	(ii) Vertical				
	(i) Sides of floor slabs	m ²	82		
	(iii) Walls	m ²	65		
	(iv) Head walls	m ²	84		
	(v) Wing walls	m ²	225		
22.08	Concrete backfill for culverts:				
	(i) Class 20/19	m ³	22		
22.1	Steel reinforcement:				
	(a) Mild steel bars				
	(i) All sizes	ton	3.2		
	(b) High tensile steel bars				
	(i) All sizes	ton	9.4		
Total Carried Forward					-

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Section	Description	Unit	Qty	Rate (R)	Amount (R)
Total Brought Forward					
	(c) Welded steel fabric				
	(i) Ref no.193	m ²	4250		
	(ii) Ref no. 245	m ²	150		-
Carried forward to Summary of Schedules					
					-

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Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 2300 CONCRETE KERBING, CONCRETE CHANNELING, CHUTES & DOWNPIPES & CONCRETE LININGS FOR OPEN DRAINS				
23.01	Precast concrete kerbing Class 25/19:				
	(a) Straight sections				
	(i) Figure 8C Mountable Kerb	m	14000		
	(ii) Figure 3 Barrier Kerb	m	14000		
	(iii) Fig 10 Edge Beam	m	28000		
	(b) Circular sections and bellmouths				
	(i) Figure 8C Mountable Kerb	m	500		
	(ii) Figure 3 Barrier Kerb	m	400		
	(iii) Fig 10 Edge Beam	m	400		
23.03 LI	Concrete chutes (typical design)				-
	(a) 300mm precast concrete chute	m	100		-
23.07	Trimming of excavation for concrete lined open drains:				
	(a) In Soft material	m ²	18000		
	(b) In hard material	m ²	1500		
23.08	Concrete lining for open drains:				
	(a) Cast in-situ concrete class 25/19	m ³	1500		
	(b) Class U2 surface finish to cast in-situ concrete	m ²	15000		
23.09	Formwork to cast-in-situ concrete lining for open drains (class F2 surface finish):				
	(a) To sides with formwork on the internal face only	m ²	1000		
	(b) To sides with formwork on both internal and external faces	m ²	2000		
	(c) To ends of slabs	m ²	1500		
Carried forward to Summary of Schedules					-

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Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 3100 BORROW MATERIALS				
31.01	Excess overburden	m³	100		
31.03	Finishing off borrow areas in				
	(a) Hard material	ha	2		
	(b) Intermediate material	ha	0.5		
	(c) Soft material	ha	0.7		
31/B17.07	Removal of topsoil and unsuitable material and temporary stockpiling thereof in				
	Topsoil				
	(a) Windrows on the edges of borrowpits or spoil areas	m³	1000		
	Unsuitable material				
	(a) Temporary stockpiles at borrow pits	m³	300		
B31/12.04	Provision for compensation to land owners				
	(a) Provisional sum for royalties of borrow pit material	Prov Sum	1	150,000.00	150,000.00
Carried forward to Summary of Schedules					

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE

Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 3300				
	MASS EARTHWORKS				
33.01	Cut and borrow to fill, including free-haul up to 1.0km:				
	(a) Material in compacted layer thickness of 200mm and less				
	(i) Compacted to 93% mod.AASHTO density	m ³	1000		
	(c) Rockfill (as specified in subclause 3209(c))	m ³	300		
33.03	Extra over item 33.01 for excavating and breaking down material in:				
	(a) Intermediate excavation	m ³	700		
	(b) Hard excavation	m ³	300		
33.04	Cut to spoil including freehaul up to 0.5km with material obtained from:				
	(a) Soft excavation	m ³	40000		
	(b) Intermediate excavation	m ³	10000		
	(c) Hard excavation	m ³	5000		
33.10	Roadbed preparation and the compaction of material:				
	(b) Compaction to 90% mod AASHTO density	m ³	18000		
Carried forward to Summary of Schedules					

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Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 3400				
	PAVEMENT LAYERS OF GRAVEL MATERIAL				
34.01	Pavement layers constructed from gravel taken from cut or borrow including free-haul up to 5,0 km				
	(a) Gravel selected layer compacted to:				
	(i) 93% Mod. AASHTO density				
	(i) 150mm Thick	m ³	18000		
	(d) Gravel s compacted to:				
	(i) G5 Sub base Compacted to 95% Mod. AASHTO density				
	(i) 150mm Thick	m ³	18000		
	(ii) G2 compacted to 88% Relative Density .				
	(i) 150mm Thick	m ³	15000		
Carried forward to Summary of Schedules					

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Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 5100				
	PITCHING, STONEMWORK AND PROTECTION AGAINST EROSION				
51.01 LI	Stone pitching:				
	(c) Grouted stone pitching on and including concrete 20Mpa/19mm bed to a total thickness of 100 mm	m ²	842		
51.06	Provision only of approved herbicide and ant poison:				
	(a) Provision of materials	PC sum	1	80,000.00	80,000.00
	(b) Overheads, charges, and profit on the above	%	80,000.00	10%	8,000.00
51.05LI	Concrete edge beams				-
	(a) Class 25/19	m ³	32		-
51.07	Foundation trench excavations and backfilling	m ³	132		-
51.08L	Construction of 3.0 wide speed hump including all markings on the speed hump and traffic signs (danger plates and speed hump warning signs)	N ^o	10		
51.15LI	Concrete drifts, 150mm thick				
	(a) Class 25/19	m ³	5		
	(b) Steel reinforcement, REF 245	m ²	15		
Carried forward to Summary of Schedules					

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 5200: GABIONS				
52.01	Foundation trench excavation and backfilling:				
	(a) In solid rock (material which requires blasting)	m ³	18		
	(b) In all other classes of materials	m ³	182		
	GABIONS				
52.02	Surface preparation for bedding of gabions	m ²	1360		
52.03	Gabions:				
	(a) Galvanized gabion boxes of the following sizes				
	(i) 2,0 x 1,0 x 1,0m Box of 80mm mesh size	m ³	285		
	(c) Galvanized gabion mattresses				
	(i) 2,0 x 1,0 x 0,3m Mattress of 50mm mesh size	m ³	314		
52.04	Synthetic-fibre filter fabric type:				
	(i) Bidim U14	m ²	682		
Carried forward to Summary of Schedules					

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 5400				
	GUARDRAILS				
54.01	Guardrails on timber posts:				
	(a) Galvanized	m	20		
54.04	End treatments:				
	(a) End wings	Nº	8		
	(b) End treatments where single guardrail section are used	Nº	4		
	(c) End treatments where double guardrail sections are used	Nº	2		
54.06	Reflective plates	Nº	32		
Carried forward to Summary of Schedules					

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 5600				
	ROAD SIGNS				
56.01	Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class I retro-reflective material, where the board is constructed from:				
	(c) Prepainted galvanized steel plate (chromadec or approved equivalent):				
	(i) Area not exceeding 2 m ²	m ²	400		
56.02	Extra over item 56.01 for using:				
	(a) Background of retro reflective material:				
	.2 Class II	m ²	400		
	(b) Lettering, symbols, numbers, arrows, emblems and borders of retro-reflective material				
	.1 Class II	m ²	300		
	.2 Class III	m ²	200		
56.03	Road sign supports (overhead road sign structures excluded):				
	(a) Steel tubing				
	.1 76mm D-section with 3mm wall thickness	ton	15		
	(b) CCA treated timber posts				
	.1 150mm Diameter	m	350		
56.05	Excavation & backfilling for road sign supports (not applicable to kilometer posts)	m ³	30		
56.06	Extra over item 56.05 for cement-treated soil backfill with 5% OPC	m ³	30		
Carried forward to Summary of Schedules					

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 5700				
	ROAD MARKINGS				
57.02	Retro-reflective road-marking paint:				
	(a) White lines (broken or unbroken)				
	(i) 100mm Wide	km	15		
	(ii) 150mm Wide	km	1		
	(iv) 300mm Wide	km	1		
	(b) Yellow lines (broken or unbroken)				
	(i) 100mm Wide	km	15		
	(c) White lettering and symbols	m ²	300		
	(d) Yellow lettering and symbols	m ²	310		
	(e) Transverse lines, painted island and arrestor bed markings (any colour)	m ²	80		
57.04	Variations in rate of application:				
	(a) White paint	litre	25		
	(b) Yellow paint	litre	50		
57.05	Road studs				
	(a) Stimsonite 88 or similar approved				
	(iv) Yellow/red	N°	500		
57.06	Setting out and pre-marking the lines (excl. traffic-island markings lettering and symbols)	km	15		
57.07	Re-establishing the painting unit at the end of the maintenance period	L/Sum	1		
Carried forward to Summary of Schedules					

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE

Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 5900 FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS				
59.01	Finishing the road and road reserve:				
	(b) Single carriageway road	km	15		
Carried forward to Summary of Schedules					

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE

Section	Description	Unit	Qty	Rate (R)	Amount (R)
	SECTION 7300				
	CONCRETE BLOCK PAVING FOR ROADS				
73.01	Concrete block paving				
	(a) Grey interlocking precast concrete paving blocks type SA (SABS approved), including all cutting of units to fit between edge restraints, laid on and including 20mm river sand, compacted and plaster sand broomed into joints on completion, including treating areas with herbicide and ant-poison (provision of herbicide and ant-poison measured elsewhere)				
	(i) 80mm to roads	m ²	80000		
	(ii) 60mm to side walks	m ²	30000		
73.02	Cast in situ concrete edge and intermediate beams				
	(a) Class 25/19 concrete	m ³	15		
73.03	Provision of approved herbicide and ant poison:				
	(a) Provision of materials	PC/sum	1	70,000.00	70,000.00
	(b) Contractor's charges and profit added to the prime cost sum	%	70,000	10%	7,000.00
Carried forward to Summary of Schedules					

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA PROVINCE

Section	Description	Unit	Qty	Rate (R)	Amount (R)
	<u>SECTION 8100</u>				
	<u>TESTING MATERIALS AND WORKMANSHIP</u>				
81.02	(a) Special tests requested by the Engineer	Prov sum	1	300,000.00	300,000.00
	(b) Overheads, charges, and profit on the above	%	300,000.00	10%	30,000.00
Carried forward to Summary of Schedule					

KAMHLUSHWA BULK SERVICES ROADS AND STORMWATER BOQ SUMMARY

SUMMARY		
COTO SECTION REFERENCE	DESCRIPTION	TENDER AMOUNT
1500	ACCOMMODATION OF TRAFFIC	
1600	OVERHAUL	
1700	CLEARING AND GRUBBING	
2100	DRAINS	
2200	PREFABRICATED CULVERTS	
2300	CONCRETE KERBING, CONCRETE CHANNELING AND CONCRETE LININGS FOR OPEN DRAINS	
3100	BORROW MATERIALS	
3300	MASS EARTHWORKS	
3400	PAVEMENT LAYERS OF GRAVEL MATERIAL	
5100	PITCHING, STONEMWORK AND PROTECTION AGAINST EROSION	
5200	GABIONS	
5400	GUARDRAILS	
5600	ROAD SIGNS	
5700	ROAD MARKINGS	
5900	FINISHING THE ROAD AND ROAD RESERVE	
7300	CONCRETE BLOCK PAVING	
8100	TESTING MATERIALS AND WORKMANSHIP	
TOTAL VALUE OF WORK:		



DEPT OF CO-OPERATIVE GOVERNANCE, HUMAN SETTLEMENTS AND TRADITIONAL AFFAIRS

KAMHLUSHWA EXT 2 AND 3 INTEGRATED HOUSING SCHEME DEVELOPMENT BULK INFRASTRUCTURE SERVICES

BULK SEWER PIPELINE

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (R)
		<u>SECTION 1:SITE CLEARANCE</u>				
2.0	SABS 1200 C	CLEARING AND GRUBBING				
2.1	8.2.1	Clearing and grubbing	m2	10000		
2.2		Strips, 2 m wide for pipelines outside road reserves	m	16300		
2.3		Removal and grubbing of large trees and tree stumps:				
2.3.1		(a) Girth exceeding 1 m up to and including 2 m	No	10		
2.4		Removal and storage of selected vegetation:				
2.5						
TOTAL CARRIED FORWARD TO SUMMARY						-

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (R)
3	SANS 1200 DB	<u>SECTION 2: EARTHWORKS (PIPE TRENCHES)</u>				
		TRENCHES FOR SEWER PIPES				
3.1	8.3.2	Excavate in all materials for trenches, manholes, backfill, compact and dispose of surplus material:				
		Pipes up to 200 mm dia for depths:				
3.1.1		Up to 1,5 m	m	9780		
3.1.1.1		Over 1,5 m up to 3,0 m	m	3260		
3.1.1.2		Over 3,0 m up to 4,5 m	m	1630		
3.1.1.3		Over 4,5 m up to 6,5 m	m	1630		
3.1.1.4		Extra over item 8.3.2 above for:				
		Intermediate material	m ³	1850		
3.1.1.5		Hard rock excavation	m ³	3950		
3.1.1.6		Boulder material, Class A	m ³	200		
3.1.1.7		Boulder material, Class B	m ³	200		
3.1.1.8		Extra over Items 8.3.2 for excavation and carting away of unsuitable and contaminated material from trench bottom and disposal at an approved landfill, as instructed by Engineer	m ³	1295		
3.1.1.9	SABS 1200DB 8.3.2	Extra over Items 3.3 to 3.8 for backfill stabilised with 3% cement as instructed by Engineer	m ³	100		
3.1.1.10	SABS 1200D 8.3.3	Extra over Items 3.3 to 3.8 for restricted excavation	m ³	200		
3.1.1.11	8.3.3.1	Make up deficiency in backfill material:				
3.2		from other necessary excavations on site	m ³	100		
3.2.1		by importation from designated borrow pits	m ³	100		
3.2.2		by importation from Commercial sources	m ³	100		
3.2.3						
TOTAL CARRIED FORWARD						-

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (R)
TOTAL BROUGHT FORWARD						-
ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (R)
4	SANS 1200 LB	<u>SECTION 3 : BEDDING (PIPES)</u>				
		BEDDING FOR SEWER PIPES				
4.1	8.2.1	Provision of bedding from trench excavations:				
4.1.1		Selected granular material	m ³	600		
4.1.1.1		Selected fill material	m ³	860		
4.1.1.2	8.2.2	Supply only of bedding by importation:				
4.1.2	8.2.2.1	From Commercial sources:				
4.1.2.1		Selected granular material	m ³	400		
4.1.2.2		Selected fill material	m ³	640		
4.2	8.2.3	Concrete Bedding Cradle (30Mpa/19mm)	m ³	90		
4.3	8.2.4	Encasing of pipes in concrete (30Mpa/19mm), anchor blocks and supports	m ³	100		
4.4	8.2.3	Supply & lay filter fabric lining to subsoil drains: Geotextile bidim (u14 or similar)	m ²	100		
4.5		Provision of bedding from commercial sources				
4.5.1		7mm crushed stone used as selected granular material	m ³	35		
4.5.2		7mm crushed stone used as selected fill blanket	m ³	35		
4.5.3		19mm crushed stone used as selected granular material	m ³	35		
4.5.4		Filter sand used as selected fill blanket	m ³	50		
4.6	8.2.4	Supply, lay and joint uPVC Class 9 pipes, complete with coupling				
4.6.1		110mm internal diameter perforated or slotted	m	100		
4.6.2		160mm internal diameter perforated or slotted	m	50		
TOTAL CARRIED FORWARD TO SUMMARY						-

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (R)
5	SANS 1200 LD	<u>SECTION 4: SEWERS</u>				
		SEWER PIPES				
		Supply of PVC-U pipes, lay, joint, bed on class C bedding and test pipeline:(400 Kpa Heavy Duty) (Class 34)				
5.1						
5.1.1		250 mm diameter	m	1600		
		315 mm diameter	m	4000		
		400 mm diameter	m	0		
4.1	8.2.1	Supply, handle, lay, and bed in Class C bedding, the uPVC Class 16				
		a) 200mm diam.	m	600		
5.1.2		STEEL PIPES				
5.2	8.2.1	Supply, lay, bed & test pipes complete with all flanged joints and repairs to coating and lining for the following grade				
		Plate thickness as specified, flanged jointing (SANS 1123 Table 2500/3), Visco-elastic Polyisobutene Coating (Two Layer Polyethylene Coating System) and cement mortar lining				
	PCS 7 PSL 3	a) 273.1mm dia, 6mm plate thickness	m	250		
5.3.3	SABS 1200 L	Supply and install 1.25m diam Manholes complete with the benching as per drawings, including covers:All rings shall be 250mm in depth. Manhole depths:				
5.4	8.2.3	Depth up to 1,5 m	No.	202		
5.4.1		Depth 1,5 m up to 3,0 m	No.	72		
5.4.2		Depth 3,0 m up to 4,5 m	No.	9		
5.4.3		Depth 4,5 m up to 6,0 m	No.			RATE ONLY
5.4.4						
5.5	8.2.3	Supply and install 1.5m diam Manholes complete with the benching as per drawings, including covers:All rings shall be 250mm in depth. Manhole depths:				
5.5.1		Depth up to 1,5 m	No.	12		
5.5.2		Depth 1,5 m up to 3,0 m	No.	4		
5.5.3		Depth 3,0 m up to 4,5 m	No.	2		
5.5.4		Depth 4,5 m up to 6,0 m	No.			RATE ONLY
TOTAL CARRIED FORWARD						-

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (R)
		TOTAL BROUGHT FORWARD				-
5.6	8.2.3	Supply Material and Construct Non Standard Manholes				
		Concrete				
5.6		200mm Thick 25MPA reinforced concrete for base slab	m ³	90		
5.6.1		200mm Thick 25MPA reinforced concrete for cover slab	m ³	62		
5.6.2		Rough Horizontal Shuttering to soffit of slab	m ²	205		
5.6.3		Rough Vertical Shuttering to slab	m ²	300		
5.6.4		Form 600x600 void in slab	no.	20		
5.6.5		Blinding, gr 15Mpa/19mm, under slab	m ³	40		
5.6.6		Masonry				
5.4.2		230mm Thick to external walls	m ²	400		
5.4.2.1		230mm Thick to internal walls	m ²	150		
5.4.2.2		110mm Thick to internal walls	m ²	60		
5.4.2.3		20mm resistant plaster (Sikalite or similar approved)	m ²	400		
5.4.2.4		Steel				
5.4.3		Y12 reinforcing steel bars	ton	1.2		
5.4.3.1		Y16 reinforcing steel bars	ton	0.86		
5.4.3.2		R10 reinforcing steel bars	ton	2.1		
5.4.3.3		Heavy duty cast iron manhole cover to detail with locking mechanism	No.	3		
5.4.3.4		Heavy duty manhole covers for road traffic application				
5.4.4		a) Circular, 760mm diameter, with ventilation openings	No.	3		
5.4.4.1		Spacer Rings to circular manhole covers				
5.4.4.2		a) 500mm high	No.	20		
5.4.4.2.1		b) 250mm high	No.	20		
5.4.4.2.2	8.2.11	Connect into existing Sewer Manhole and make good	No	5		
5.5						
		TOTAL CARRIED FORWARD TO SUMMARY				-

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (R)
7	SANS 1200 LG	SECTION 6 : SEWER PUMPSTATION - GUARDROOM AND OPERATOR ROOM Clear site for the whole area around perimeter of existing house of all vegetation, rubble,debris etc and cart away to dump site.	m ²	24		
7.1	8.2.1	Excavate for foundation trenches 0.6m deep	m ³	18		
7.1.1		Backfill trenches with excavated material.	m ³	12		
7.1.2		Imported filling under concrete beds in layers not exceeding 150mm,compacted to 90% Mod AASHTO, to a maximum of 400mm thick	m ³	36		
7.2		Soil poisoning to protect against termites,	l	2		
7.2.1		Supply and install SABS approved 250 micron proof membrane selead at joints with SABS joints tape.	m ²	21		-
7.2.2		Supply and fix mesh reinforcement (ref193) in surface bed.	m ²	21		-
7.2.3		Construct 1m x 0.75m thick concrete apron@10Mpa all around	m ³	12		
7.3		Supply Concrete 25Mp/19mm in footing	m ³	12		
7.3.1		Reinforce Concrete 25Mp/19mm to floors	m ³	15		
7.4	8.2.1 PCS 7 PSL 3	Test concrete Strength at 7 and 28 days.	Sum	1		
7.4.1		Iron-floated surface finishes	m ²	21		
7.4.1		Build 230mm blockwork in foundation with brickforce for every corner and conjunction	m ²	52		
7.4.1		Supply SABS approved 375 micro damp proof of course under all walls and window cills	m	100		
7.4.2	8.2.9	Build 230mm brickwork in superstructure (slab to roof height) with brick at every corner and junction(Internal and external walls)	m ²	100		-
7.4.2.1		Supply prestressed precast concrete lintels 230m wide x 1500mm long for W1	No	1		
7.4.2.2		Supply prestressed precast concrete lintels 230m wide x 1500mm long for W2	No	1		
7.4.2.3	PSLG	Supply and fix Internal and external (concrete) air vent	No	4		
7.4.2.4	8.2.10	Fit external steel door frame for door size 813x2032mm and door	No	1		
	8.2.11	Fit external steel security frame for door size 813x2032mm	No	1		

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

7.4.2.5		Supply and install steel window frame (W1) including 4mm clear float window panes and putty.	No	3		-
7.4.2.6	8.2.12	Supply and install steel window frame (W2) including 4mm clear float window panes and putty.	No	1		
7.4.2.7		Supply and install window cills bedded in cement mortar	m	6		
7.5		Fix wallplate 38mmx114mm treated rafter fixed to blockwork	m	12		-
7.6		Supply and install 0.6mm thick galvanized Chromadek or IBR roof sheeting	m ²	24		
7.7		Supply and install 114 x 38mm prefabricated Roof Trusses at 1100mm centres and purlins at maximum of 1050 centres (supply for roof trusses from reputable source) per unit	No	8		
7.8		Supply ridge capping to match the roof covering.	m	7		
7.9		Supply and install 12mm plaster to internal walls including preparations and paint to walls with SABS approved PVA	m ²	72		
7.1		Prepare surface and apply adhesive cement mortar and lay 300x300mm ceramic floor tiles including grouting of tiles and cleaning of the finished work.	m ²	21		-
7.11		Prepare surfaces and remove all loose material, apply one coat primer and 2 coats acrylic PVA paint.				-
7.11.1		on ceilings and cornices	m ²	21		-
7.11.2		on internal walls	m ²	21		
7.11.3		on external walls	m ²	21		
7.11.4		On roofing sheet.	m ²	21		
7.12		Supply and fix 100 x 75mm eaves gutters	m	12		
7.13		Supply and fix 100mm eaves gutter stopend	No	4		
7.14		Supply and fix gutter down pipes fixed to walls with wall plugs.	No	4		
7.15		Supply and fix front flush Toilet include pan, cistern, basin, pedestal, toilet seat, mechanism, basin tap.	No	1		
7.16		Supply and fix shower head	No	1		
7.17		Plumbing accessories	Sum	1		
7.18		Supply and fix electrical wiring	Sum	1		
7.19		Supply and install 100l geyser	Sum	1		
	SANS 1200G	Deliver and erect 2.4m high concrete palisade fence complete as per manufacturers specifications	m	120		

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

		Gate				
		Install 6m sliding vehicle gate complete	no	1		
		Install 1.2m pedestrian Gate	no	1		
		TOTAL CARRIED FORWARD TO SUMMARY				

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

ITEM NO	PAYMENT REFERS	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (R)
8		SECTION 7: SEWER LIFT PUMPSTATION				
8.1		SITE CLEARANCE				-
8.2		EARTHWORKS				-
8.2.1		Bulk excavation:				-
8.2.1.1		Excavate in all materials and use for backfill	m³	100		-
8.2.1.2		Inlet Structure Concrete works 30MPA				
8.2.1.3		Construction of concrete Inlet Structure	m3	60		
8.2.1.4		Formwork with smooth finish on the Inle Structure	m2	150		
8.2.1.5		Supply and install 1800.0m diam Manholes complete with the benching as per drawings, including covers:All rings shall be 250mm in depth. Manhole depths: SUMP DEPTH +/-4m	No	16		
8.3		Supply material and construct brick shelter to house the pumping units	sum	1		-
8.4		SURFACE PUMPING UNITS				-
8.4.1		Supply, delivery and installation of surface pumping units				-
8.4.2		Surface puming units with all mechanical accessories Q= 6l/s TDH- 30m, valves, control panel, overflow protector as per engineer specifications				-
8.4.3		Pump unit complete with electrical motor	No	2		
8.4.4		Base frame, steel supporting frames and fixed gantry beam including chain block 2ton	No	2		
8.4.5		Rising steel pipe 160mm and flanges	m	8		
8.4.6		Rising pump supports	no	8		
8.5		ELECTRICAL WORK				
8.5.1		Draw power supply for the lift pumpstation- 100KVA	sum	1		
8.5.2		Mechanical Works				-
8.5.3		Supply and install steel access ladder in the inlet structure 5m stainless steel	no	2		-
8.5.4		Supply and install mechanical locking devices on the inlet structure	no	2		
8.5.5		Testing and commissioning of a submersible pumps	Sum	1		
8.6		Miscellaneous Works				
8.6.2		Supply material and install concrete palisade concrete reserrior and paving	sum	1		
		TOTAL CARRIED FORWARD TO SUMMARY				-

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

9	SECTION 7: SUPPLY OF STANDBY POWER-GENERATOR				-
9.1	Supply and delivery of 110kva Generator, fuel tank and Container for shelter as per specification	No	1		-
9.2	Concrete works	m3	20		
9.3	Installation of the generator, fuel tank and Container	No	1		
9.4	Testing and commissioning of generator	Sum	1		
TOTAL CARRIED FORWARD TO SUMMARY					



DEPT OF CO-OPERATIVE GOVERNANCE, HUMAN SETTLEMENTS AND TRADITIONAL AFFAIRS

SCHEDULES OF QUANTITIES FOR SEWER WORKS

KAMHLUSHWA EXT 2 AND 3 INTEGRATED HOUSING SCHEME DEVELOPMENT BULK INFRASTRUCTURE SERVICES

SECTION	DESCRIPTION	AMOUNT
1	SECTION 1 :SITE CLEARANCE	
2	SECTION 2: EARTHWORKS (PIPE TRENCHES)	
3	SECTION 3 : BEDDING (PIPES)	
4	SECTION 4: SEWERS	
5	SECTION 6 : SEWER PUMPSTATION - GUARDROOM AND OPERATOR ROOM	
6	SECTION 7: SEWER LIFT PUMPSTATION	
7	SECTION 8: STANDBY POWER GENERATOR	
SUB - TOTAL FOR CONSTRUCTION		

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE.



DEPT OF CO-OPERATIVE GOVERNANCE, HUMAN
SETTLEMENTS AND TRADITIONAL AFFAIRS

KAMHLUSHWA EXT 2 AND 3 HOUSING SCHEME DEVELOPMENT BULK INFRASTRUCTURE SERVICES

BULK WATER PIPELINE

SANS 1200

SECTION A: TRENCH EXCAVATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
2	SANS 1200	<u>SECTION A: TRENCH EXCAVATION</u>				
	SANS 1200 C	<u>SITE CLEARANCE</u>				
2.1	8.2.1	Clear vegetation and trees of girth up to 1 m for a 3 m wide strip along pipelines (PS C 5.1)	m	3,500		
	8.2.2	Remove and grub large trees and tree stumps of girth (PS C 5.2.3.2)				
2.2		a) over 1m and up to and including 2m	No	5		
2.3		b) over 2m and up to and including 3m	No	5		
2.4	PS C 8.2.2	c) Remove plants, lawn, flowers, etc., and reinstate to its original state after completion of the works	m ²	800		
2.5	PS C 8.2.5	a) Take down existing fences and boundary walls and reinstate to its original state after completion of the works	m	200		
2.6		b) Remove paving blocks, concrete slabs, asphalt paving etc., and reinstate to its original state after completion of the works	m ²	350		
	SANS 1200DB	<u>EXCAVATION</u>				
	8.3.2	a) Excavate in all materials except hard, including sieving and backfilling, compacted to 93% MAASHTO density and dispose of surplus material (erf connctions excluded)				
2.7		i) Excavate by hand up to 1.0m deep and dispose as per Engineer specifications (Local Labour)	m	1,500		
2.8		ii) Excavate with machinery up to 1.5 m deep	m	3,350		
TOTAL CARRIED FORWARD						

SECTION A: TRENCH EXCAVATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
BROUGHT FORWARD						
2.9		iii) Excavate with machinery over 1.5m to 2.5m deep	m	150		
		b) Extra-over item 8.3.2 (a) for				
2.11		i) Hard rock excavation (Provisional)	m³	2,350		
2.12		ii) Boulder excavation Class B (SANS 1200D, 3.1.2)	m³	400		
2.13	8.3.2	c) Excavate and dispose of unsuitable material from trench bottom (Provisional)	m³	1,050		
2.14	8.3.3.1c)	Import backfill material from commercial or off-site sources selected by the contractor (Provisional)	m³	1,900		
		"TAKE-UP ITEM"				
	PS DB 8.3.2	d) Excavate in existing backfilled trench, including sieving and backfilling, compacted to 93% MAASHTO density to expose existing pipe for connection purposes	m³	780		
2.15	8.3.3.1	c) Import backfill material from commercial or off-site sources selected by the contractor (inclusive of all costs)	m³	960		
2.16	8.3.3.3	Compacting in road reserves	m³	350		
2.17	8.3.4	Limited Overhaul (provisional)	m³	700.0		
		Long Overhaul (provisional)	m³km	1,400.0		
2.18	PS DB 8.3.5	Existing Services that intersect or adjoin a pipe trench				
2.19		a) Services that intersect a trench	No	20		
		b) Services that adjoin a trench	m	150		
2.20	PS DB 8.3.6.1	Reinstate road surfaces complete with all courses				
2.21		a) Gravel on shoulders	m²	200		
2.22		b) Asphalt of thickness 20 mm in parking areas	m²	250		
2.23		c) Asphalt of thickness 30 mm in roadway	m²	250		
2.24		d) Concrete drains	m³	50		
		e) Kerbs and edge beams	m	150		
TOTAL CARRIED FORWARD						
SECTION A: TRENCH EXCAVATION						
2.25						
	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
2.26		TOTAL BROUGHT FORWARD				
		f) Crack sealing with Colseal of 'Colas'	m	40		
		g) Apply 4 mm thick slurry over existing seal	m²	20		
	SANS 1200D	EXISTING SERVICES				
2.28	8.3.8.1	Location of services by:				
		c) Excavate by hand in soft material to expose	m³	50		
TOTAL CARRIED FORWARD TO SUMMARY						

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE.

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
3						
		SECTION B: PIPE BEDDING				
	SANS 1200LB	SECTION B: PIPE BEDDING				
3.1		Class C Bedding for Flexible pipes				
3.2	8.2.1	Provision of bedding from trench excavation				
		a) Selected granular material for cradle	m³	850		
		b) Selected fill material for blanket	m³	1,105		
3.3	8.2.2	Supply only of bedding by importation				
3.4	8.2.2.3	From commercial sources (Provisional)				
		a) Selected granular material for cradle	m³	510		
		b) Selected fill material for blanket	m³	1,000		
		"TAKE-UP ITEM"				
	PSLB1200	From commercial sources for "Take-Up" spots on				
		a) Selected granular material for cradle	m³	720		
		b) Selected fill material for blanket	m³	936		
TOTAL CARRIED FORWARD TO SUMMARY						

4		KAMHLUSHWA EXT 2 AND 3 BULK WATER PIPELINE			SECTION C: PIPES AND FITTINGS	
ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
	SANS	SECTION C: PIPES AND FITTINGS				
4.1	8.2.1	Supply, handle, lay, and bed in Class C bedding, the uPVC Class 16				
		a) 250mm diam.	m	1,678		
		b) 315mm diam.	m	1846		
4.1		"TAKE-UP ITEM"				
		uPVC Class 12				
		a) 110mm diam.	m			Rate Only
		b) 160mm diam.	m			Rate Only
4.2	8.2.2	Extra-over 8.2.1 for the supplying,				
	8.2.2.1	11,25 deg. bends (uPVC class 16)				
4.3		a)250mm	No	6		
4.4	8.2.2.2	22,5 deg. bends (uPVC class 16)				
		a)250mm	No	6		
4.5	8.2.2.3	45 deg. bends (uPVC class 16)				
		a) 250mm	No	3		
4.6	8.2.2.4	90 deg. bends (uPVC class 16)				
4.7		a) 250mm	No	4		
4.8	8.2.2.5	T-Piece (Cast iron) for uPVC				
		a) 250mm x 110mm x 250mm	No			Rate Only
4.9		b)250mm x 75mm x250mm	No			Rate Only
	8.2.2.6	Reducers (Cast iron) for uPVC				
		a) 250mm x 110mm	No			Rate Only
		b) 250mm x160mm	No			Rate Only
TOTAL CARRIED FORWARD						

ITEM NO		KAMHLUSHWA EXT 2 AND 3 BULK WATER PIPELINE				
BROUGHT FORWARD		SECTION C: PIPES AND FITTINGS				
PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R	
4.10	8.2.2.7	End caps (Cast iron) for uPVC pipes				
	a) 315mm	No			Rate Only	
4.11	8.2.2.10	Flange Adaptors for uPVC				
4.12	a) 250mm	No	10	3,500.00		
4.13	b) 110mm	No			Rate Only	
	b) 160mm	No			Rate Only	
4.14	L	Extra-over 8.2.1 for the supplying, fixing and bedding				
4.15	a) On newly installed uPVC pipes					
4.16	i) 250mm	No	3			
4.17	ii) 160mm	No			Rate Only	
4.18	PS L	Anchor/thrust blocks and pedestals -Concrete 25MPA	m ³	15		
4.19	PS L	Valve chambers for gate valves as per drawing	No	8		
	8.2.13					
4.20	PS L 8.2.16	Supply,deliver and install air release and scour valves complete with manhole chambers as shown on	No	3		
		Supply,deliver and construct tie in chambers complete	No	2		
4.21	PS L	Pipe markers	No	15		
4.22	PS L	Cut and connect onto existing water				
	a) Onto uPVC pipe	No	1			
	b) Onto steel pipe	No	1			
TOTAL CARRIED FORWARD TO SUMMARY						

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT, MPUMALANGA

PROVINCE: SECTION D: COMMAND RESERVOIR & ELEVATED STEEL TANKS

NO	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
D.1	SABS 1200C	SITE CLEARANCE				
D.1.1	8.2.1	Clear and grub for tank footings. Remove top soil to nominal depth of 100mm and stockpile for later use as directed by Engineer.	m ²	35		
D.2	SABS 1200D	EARTHWORKS				
D.2.1		Excavations for structures: Bulk excavation in all material for tank footings up to design levels, use for backfill, compacted to 93% Mod AASHTO density, or embankment or dispose of surplus material where instructed.	m ³	200		
D.2.2	8.3.2	Importation of material from an open borrow pit within 1,0km freehaul distance, place in backfill and compact to 93% mod AASHTO density.	m ³	50		
D.2.3	8.3.2b)	Extra over for above items for Hard rock excavation	m ³	15		
D.3	SABS 1200G	CONCRETE (STRUCTURAL)				
D.3.1	8.3	REINFORCING				
D.3.1.1	8.3.1	Steel bars				
D.3.1.1.1		Mild steel in: Foundation	t	2.6		
D.3.1.1.2		High-tensile steel in: Foundation	t	6		
D.3.1.1.3		High-Tensile welded mesh				
D.3.1.3		Ref. 395	m ²	280		
D.3.1.4		Ref. 617	m ²	100		
D3.2	8.4	CONCRETE				
D3.2.1	8.4.2	Blinding layer Blinding layer, class 15 MPa/19mm concrete, 50mm thick for all levels where reinforced concrete will be placed, including the necessary shuttering and finishing	m ²	160		
D.3.2.2		Concrete filling, class 15 MPa/19mm concrete for anchor blocks, filling where ordered by Engineer	m ³	12		
D.3.2.3		Strength concrete class 30 MPa/19mm for the following:				
D.3.2.3	8.4.3	Foundation	m ³	30		
D.3.2.4		Concrete base	m ³	12		
D.4		MISCELLANEOUS				
D.4.1		The supply, deliver and erection of an elevated storage tank. The rate shall include the supply of all relevant inlet and outlet pipe work valves, valve boxes, including a control valve at the inlet as well as one for the outlet. Complete with scour outlet pipes, fixed to the main structure, associated valves and integrated with the supply source MMC and PLC.				
D.4.1.1		a) 1000kl	Prov Sum	1	R 8,943,959.94	R 8,943,959.94
D.4.1.2		b) Handling Cost	%			
D.4.2		Supply, deliver, fit, install and test complete Pneumatic Telemetric System (to be approved by the Engineer) between bulk supply pipeline and float control valve in the elevated tank.	Sum	1		
D.4.3		Supply deliver and install a Catladder with lockable door for the elevated tank	No.	1		
D.4.4		Provide a level indicator to indicate the level of water in the elevated tank.	No.	1		
D.5	SABS 1200L	MEDIUM PRESSURE PIPELINES				
D.5.1	8.2.1	Supply, handle, lay, joint, cut pipes to length, bed and test Schedule 10 steel pipes, including one coupling per pipe				
D.5.1.1		a) 350mm dia. NB to inlet	m	1		
D.5.1.2		b) 350mm dia. NB from bottom outlet	no	2		
D.5.1.3		c) 150mm Flanged overflow	no	2		
D.5.1.4		d) 150mm flanged scour	no	2		
		Allow Provisional Sum for the construction of command reservoir 10 Mega-Litre	Prov.sum	1	R 48,000,000.00	R 48,000,000.00
TOTAL SECTION D TO SUMMARY						

APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE

DEPT OF CO-OPERATIVE GOVERNANCE, HUMAN SETTLEMENTS AND TRADITIONAL AFFAIRS

KAMHLUSHWA EXT 2 AND 3 INTEGRATED HOUSING SCHEME DEVELOPMENT BULK

SECTION	DESCRIPTION	AMOUNT
A	TRENCH EXCAVATION	
B	PIPE BEDDING	
C	PIPES AND FITTINGS	
D	COMMON RESEVOIR AND ELEVATED STEEL TANK	
SUB - TOTAL FOR CONSTRUCTION		

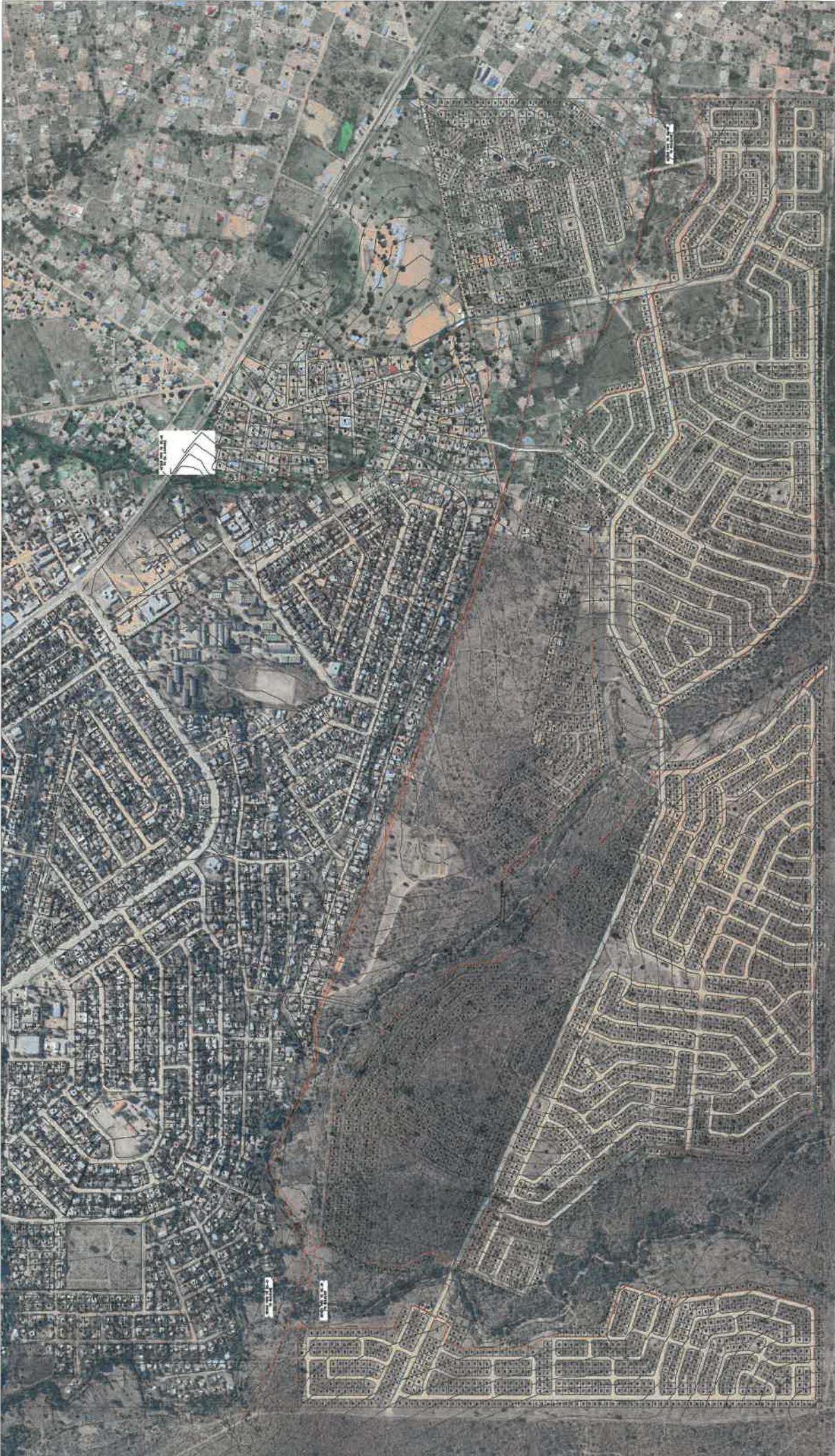
APPOINTMENT OF A CONTRACTOR FOR THE PROVISION OF BULK INFRASTRUCTURE IN KAMHLUSHWA EXTENSION 2 3 UNDER NKOMAZI LOCAL MUNICIPALITY IN EHLANZENI DISTRICT,MPUMALANGA PROVINCE



DEPT OF CO-OPERATIVE GOVERNANCE, HUMAN SETTLEMENTS AND

KAMHLUSHWA EXT 2 AND 3 INTEGRATED HOUSING SCHEME DEVELOPMENT BULK

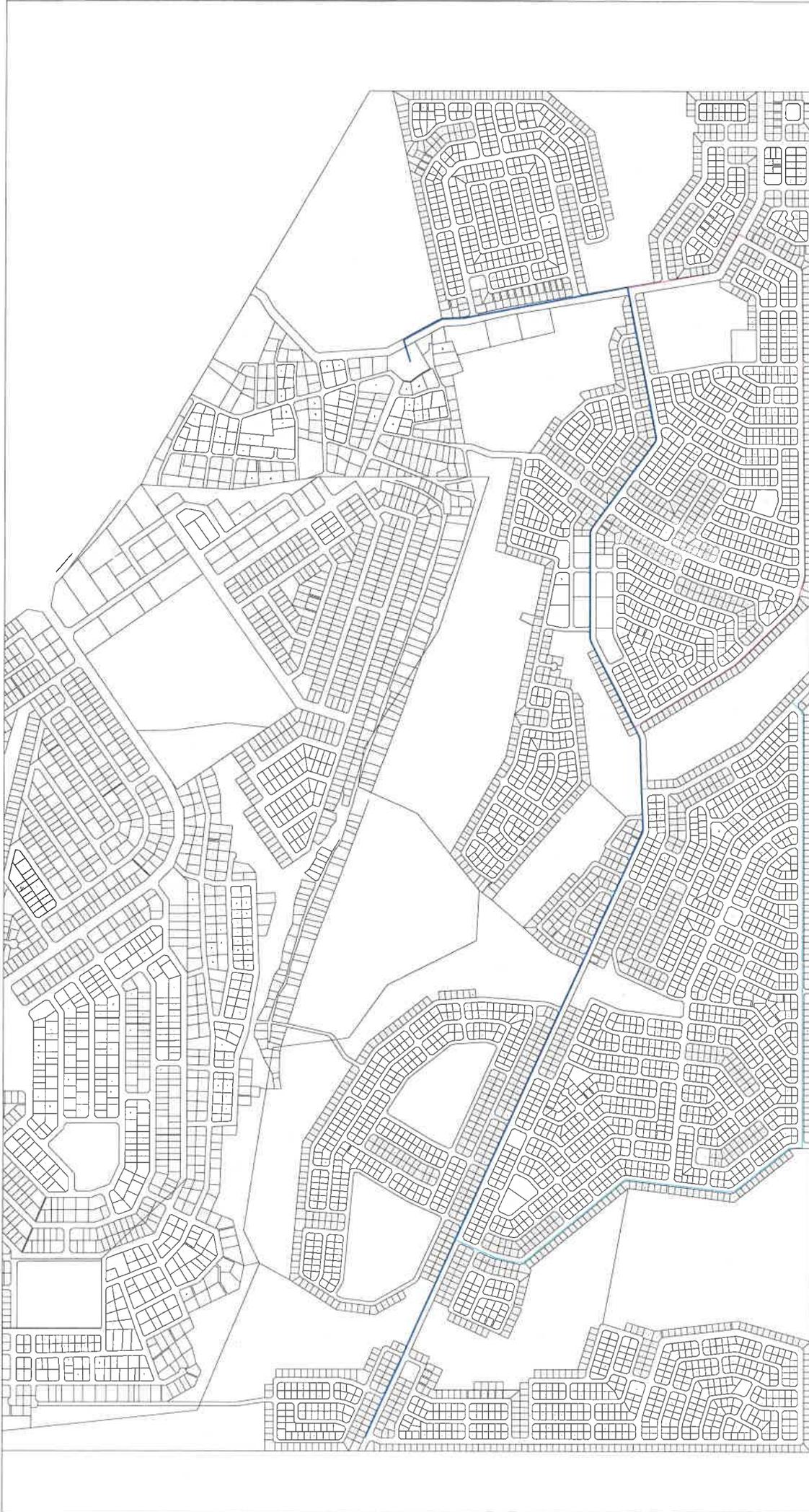
SECTION	DESCRIPTION	AMOUNT
2	PRELIMINARY AND GENERAL	
3	WATER WORKS	
4	SEWER WORKS	
5	ROADS AND STORMWATER	
SUB - TOTAL FOR CONSTRUCTION		
ADD 10% CONTINGENCIES		
SUBTOTAL		
ADD 10% CPA		
GRAND TOTAL CONSTRUCTION COST ESTIMATE		



SCALE	AS SHOWN
DISCIPLINE	CIVIL ENGINEERING
PROJECT TITLE	KAMHLUSWA EXT. 2 & 3 INTERGRATED HUMAN SETTLEMENT IN NKOMAZI LOCAL MUNICIPALITY
DRAWING TITLE	SEWER & WATER BULKLINE LAYOUT

SEWER & WATER BULKLINE LAYOUT

No.	DATE	REVISION	RECORDED	DATE	PRINCIPAL CONSULTANT	 PERAZZI CONSULTING Project Management 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	DRAWN CHECKED APPROVED DATE	CONSULTANT FOR CONSULTING DESIGNER DATE	RECOMMENDED CLIENT DATE	CLIENT IN FIELD OF SETTLEMENT DATE	AS SHOWN REFUSION	SCALE AS SHOWN	DISCIPLINE CIVIL ENGINEERING	PROJECT TITLE KAMHLUSWA EXT. 2 & 3 INTERGRATED HUMAN SETTLEMENT IN NKOMAZI LOCAL MUNICIPALITY	DRAWING TITLE SEWER & WATER BULKLINE LAYOUT	PROJECT No. TBA
																SHEET 1 OF 1 DRAWING No. KAM_SW_100



LEGEND	
SYMBOL	DESCRIPTION
[Line symbol]	OFF BOUNDARY
[Line symbol]	100MM WATER PIPELINE
[Line symbol]	150MM WATER PIPELINE
[Line symbol]	200MM WATER PIPELINE
[Line symbol]	300MM WATER PIPELINE

WATER BULK LINE LAYOUT

 <p>FEROZZ CONSULTING Engineering and Project Management 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999</p>		<p>PRINCIPAL CONSULTANT</p> <p>CLAUDIUS FERREZ CONSULTING Engineering and Project Management 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999</p>	<p>CLIENT</p> <p>COGHSTA KAMHLUSWA EXT. 2 & 3 INTERGRATED HUMAN SETTLEMENT IN NKOMAZI LOCAL MUNICIPALITY WATER BULKLINE LAYOUT</p>	<p>RECOMMENDED</p> <p>DATE:</p>	<p>CONSULTANT</p> <p>DATE:</p>	<p>SCALE</p> <p>AS SHOWN</p>	<p>PROJECT TITLE</p> <p>WATER BULKLINE LAYOUT</p>	<p>DISCIPLINE</p> <p>CIVIL ENGINEERING</p>	<p>PROJECT No.</p> <p>TBA</p>
<p>NO.</p> <p>DATE</p> <p>REVISION</p>	<p>DATE</p> <p>REVISION</p>	<p>PROJECT No.</p> <p>TBA</p>	<p>SHEET 1 OF 1</p> <p>DRAWING No.</p> <p>KAMI_WTR_100</p>						



Application for a Tax Clearance Certificate

Purpose

Select the applicable option Tenders | Good standing

If "Good standing", please state the purpose of this application

Particulars of applicant

Name/Legal name
(Initials & Surname
or registered name)

Trading name
(if applicable)

ID/Passport no

Company/Close Corp.
registered no

Income Tax ref no

PAYE ref no 7

VAT registration no 4

SDL ref no L

Customs code

UIF ref no U

Telephone no

Fax
no

E-mail address

Physical address

Postal address

Particulars of representative (Public Officer/Trustee/Partner)

Surname

First names

ID/Passport no

Income Tax ref no

Telephone no

Fax
no

E-mail address

Physical address

Particulars of tender (If applicable)

Tender number

Estimated Tender amount R

Expected duration of the tender year(s)

Particulars of the 3 largest contracts previously awarded

Date started	Date finalised	Principal	Contact person	Telephone number	Amount
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Audit

Are you currently aware of any Audit investigation against you/the company? YES NO
If "YES" provide details

[Empty box for providing details if YES]

Appointment of representative/agent (Power of Attorney)

I the undersigned confirm that I require a Tax Clearance Certificate in respect of Tenders or Goodstanding.

I hereby authorise and instruct to apply to and receive from SARS the applicable Tax Clearance Certificate on my/our behalf.

	Signature of representative/agent	Date
	Name of representative/agent	

Declaration

I declare that the information furnished in this application as well as any supporting documents is true and correct in every respect.

	Signature of applicant/Public Officer	Date
	Name of applicant/Public Officer	

Notes:

1. It is a serious offence to make a false declaration.
2. Section 75 of the Income Tax Act, 1962, states: Any person who
 - (a) falls or neglects to furnish, file or submit any return or document as and when required by or under this Act; or
 - (b) without just cause shown by him, refuses or neglects to-
 - (i) furnish, produce or make available any information, documents or things;
 - (ii) reply to or answer truly and fully, any questions put to him ...
 As and when required in terms of this Act ... shall be guilty of an offence ...
3. SARS will, under no circumstances, issue a Tax Clearance Certificate unless this form is completed in full.
4. Your Tax Clearance Certificate will only be issued on presentation of your South African Identity Document or Passport (Foreigners only) as applicable.

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

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

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

2. Bidder's declaration

2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest¹ in the enterprise, employed by the state? **YES/NO**

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

Full Name	Identity Number	Name of State institution

2.2 Do you, or any person connected with the bidder, have a relationship

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

with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:

.....
.....

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

2.3.1 If so, furnish particulars:

.....
.....

3 DECLARATION

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

- 3.1 I have read and I understand the contents of this disclosure;
- 3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
- 3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium² will not be construed as collusive bidding.
- 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
- 3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
- 3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring

² Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

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

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

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

.....
Signature	Date
.....
Position	Name of bidder

**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**

(delete whichever is not applicable for this tender).

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

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

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

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

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	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 OR 90/10 PREFERENCE POINT SYSTEMS

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

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

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:

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

Where

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

4. POINTS AWARDED FOR SPECIFIC GOALS

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

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

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

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

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

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

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

POINTS FOR CONTRACTING AN ENTERPRISE OWNED BY HISTORICALLY DISADVANTAGED PERSONS OR INDIVIDUALS			
HISTORICALLY DISADVANTAGED PERSONS OR INDIVIDUALS	POINTS ALLOCATION	Number of points claimed (90/10 system)	SOURCE DOCUMENTS REQUIRED TO CLAIM POINTS
Female	2,0		Attach a copy of a Full CSD report printed after advert date
Youth	2,0		
People living with disability	2,0		A copy of a valid Medical Certificate to confirm disability
Military Veterans	1,0		A certified copy of military veteran certificate
Locality: within relevant areas	3,0		Attach a certified copy of business registration document or lease agreement together with Proof of municipal levies and or rates and taxes account or water and or Electricity accounts) Points will be allocated as follows. <ul style="list-style-type: none"> • 1 x point business is within Mpumalanga Province • 1 x point business is within Ehlanzeni District. • 1 x point is within Nkomazi Local Municipality
TOTAL PREFERENCE POINTS TO BE CLAIMED	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.

<p>.....</p> <p>SIGNATURE(S) OF TENDERER(S)</p>
<p>SURNAME AND NAME:</p>
<p>DATE:</p>
<p>ADDRESS:</p> <p>.....</p> <p>.....</p> <p>.....</p>

DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS

This Standard Bidding Document (SBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2017, the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:2011 (Edition 1) and the Guidance on the Calculation of Local Content together with the Local Content Declaration Templates [Annex C (Local Content Declaration: Summary Schedule), D (Imported Content Declaration: Supporting Schedule to Annex C) and E (Local Content Declaration: Supporting Schedule to Annex C)].

1. General Conditions

- 1.1. Preferential Procurement Regulations, 2017 (Regulation 8) make provision for the promotion of local production and content.
- 1.2. Regulation 8.(2) prescribes that in the case of designated sectors, organs of state must advertise such tenders with the specific bidding condition that only locally produced or manufactured goods, with a stipulated minimum threshold for local production and content will be considered.
- 1.3. Where necessary, for tenders referred to in paragraph 1.2 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.
- 1.4. A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.
- 1.5. The local content (LC) expressed as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 2011 as follows:

$$LC = [1 - x / y] * 100$$

Where

- x is the imported content in Rand
y is the bid price in Rand excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by South African Reserve Bank (SARB) on the date of advertisement of the bid as indicated in paragraph 3.1 below.

The SABS approved technical specification number SATS 1286:2011 is accessible on http://www.thedti.gov.za/industrial_development/ip.jsp at no cost.

A bid may be disqualified if this Declaration Certificate and the Annex C (Local Content Declaration: Summary Schedule) are not submitted as part of the bid documentation;

2. The stipulated minimum threshold(s) for local production and content (refer to Annex A of SATS 1286:2011) for this bid is/are as follows:

No	Designated Items	Designated Minimum percentage
1	Construction Material and Components	100%
2	Cement	100%
3	Steel and Prefabricated Steel material	100%
4	Joining/Connecting Components	100%
5	Fasteners	100%
6	Electrical cables	90%
7	steel value added products	100%
8	Valves	70%
9	Pumps	70%
10	Motor	70%
11	PVC Pipes	100%

3. Does any portion of the goods or services offered have any imported content?

(Tick applicable box)

YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

- 3.1 If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.5 of the general conditions must be the rate(s) published by SARB for the specific currency on the date of advertisement of the bid.

The relevant rates of exchange information is accessible on www.resbank.co.za

Indicate the rate(s) of exchange against the appropriate currency in the table below (refer to Annex A of SATS 1286:2011):

Currency	Rates of exchange
US Dollar	
Pound Sterling	
Euro	
Yen	
Other	

NB: Bidders must submit proof of the SARB rate (s) of exchange used

4. Where, after the award of a bid, challenges are experienced in meeting the stipulated minimum threshold for local content the dti must be informed accordingly in order for the dti to verify and in consultation with the AO/AA provide directives in this regard.

LOCAL CONTENT DECLARATION

(REFER TO ANNEX B OF SATS 1286:2011)

LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF BID NO.

ISSUED BY: (Procurement Authority / Name of Institution):
.....

NB

- 1 The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.
- 2 Guidance on the Calculation of Local Content together with Local Content Declaration Templates (Annex C, D and E) is accessible on http://www.thedti.gov.za/industrial_development/ip.jsp. Bidders should first complete Declaration D. After completing Declaration D, bidders should complete Declaration E and then consolidate the information on Declaration C. **Declaration C should be submitted with the bid documentation at the closing date and time of the bid in order to substantiate the declaration made in paragraph (c) below.** Declarations D and E should be kept by the bidders for verification purposes for a period of at least 5 years. The successful bidder is required to continuously update Declarations C, D and E with the actual values for the duration of the contract.

I, the undersigned, (full names),

do hereby declare, in my capacity as

of(name of bidder entity), the following:

- (a) The facts contained herein are within my own personal knowledge.
- (b) I have satisfied myself that:
 - (i) the goods/services/works to be delivered in terms of the above-specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286:2011; and
- (c) The local content percentage (%) indicated below has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 3.1 above and the information contained in Declaration D and E which has been consolidated in Declaration C:

Bid price, excluding VAT (y)	R
Imported content (x), as calculated in terms of SATS 1286:2011	R
Stipulated minimum threshold for local content (paragraph 3 above)	
Local content %, as calculated in terms of SATS 1286:2011	

If the bid is for more than one product, the local content percentages for each product contained in Declaration C shall be used instead of the table above.

The local content percentages for each product has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 3.1 above and the information contained in Declaration D and E.

- (d) I accept that the Procurement Authority / Institution has the right to request that the local content be verified in terms of the requirements of SATS 1286:2011.
- (e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286:2011, may result in the Procurement Authority / Institution imposing any or all of the remedies as provided for in Regulation 14 of the Preferential Procurement Regulations, 2017 promulgated under the Preferential Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____

DATE: _____

WITNESS No. 1 _____

DATE: _____

WITNESS No. 2 _____

DATE: _____

Annex E

Local Content Declaration - Supporting Schedule to Annex C

(E1)	Tender No.	<input style="width: 95%;" type="text"/>
(E2)	Tender description:	<input style="width: 95%;" type="text"/>
(E3)	Designated products:	<input style="width: 95%;" type="text"/>
(E4)	Tender Authority:	<input style="width: 95%;" type="text"/>
(E5)	Tendering Entity name:	<input style="width: 95%;" type="text"/>

Note: VAT to be excluded from all calculations

Local Products (Goods, Services and Works)	Description of items purchased	Local suppliers	Value
	(E6)	(E7)	(E8)
(E9) Total local products (Goods, Services and Works)			<input style="width: 95%;" type="text"/>

(E10)	Manpower costs (Tenderer's manpower cost)	<input style="width: 95%;" type="text"/>
(E11)	Factory overheads (Rental, depreciation & amortisation, utility costs, consumables etc.)	<input style="width: 95%;" type="text"/>
(E12)	Administration overheads and mark-up (Marketing, insurance, financing, interest etc.)	<input style="width: 95%;" type="text"/>
(E13) Total local content		<input style="width: 95%;" type="text"/>

This total must correspond with Annex C - C24

Signature of tenderer from Annex B

Date: _____

THE NATIONAL TREASURY

Republic of South Africa



**GOVERNMENT PROCUREMENT:
GENERAL CONDITIONS OF CONTRACT**

July 2010

GOVERNMENT PROCUREMENT
GENERAL CONDITIONS OF CONTRACT
July 2010

NOTES

The purpose of this document is to:

- (i) Draw special attention to certain general conditions applicable to government bids, contracts and orders; and
- (ii) To ensure that clients be familiar with regard to the rights and obligations of all parties involved in doing business with government.

In this document words in the singular also mean in the plural and vice versa and words in the masculine also mean in the feminine and neuter.

- The General Conditions of Contract will form part of all bid documents and may not be amended.
- Special Conditions of Contract (SCC) relevant to a specific bid, should be compiled separately for every bid (if applicable) and will supplement the General Conditions of Contract. Whenever there is a conflict, the provisions in the SCC shall prevail.

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General Conditions of Contract

1. Definitions

1. The following terms shall be interpreted as indicated:
 - 1.1 "Closing time" means the date and hour specified in the bidding documents for the receipt of bids.
 - 1.2 "Contract" means the written agreement entered into between the purchaser and the supplier, as recorded in the contract form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.
 - 1.3 "Contract price" means the price payable to the supplier under the contract for the full and proper performance of his contractual obligations.
 - 1.4 "Corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value to influence the action of a public official in the procurement process or in contract execution.
 - 1.5 "Countervailing duties" are imposed in cases where an enterprise abroad is subsidized by its government and encouraged to market its products internationally.
 - 1.6 "Country of origin" means the place where the goods were mined, grown or produced or from which the services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.
 - 1.7 "Day" means calendar day.
 - 1.8 "Delivery" means delivery in compliance of the conditions of the contract or order.
 - 1.9 "Delivery ex stock" means immediate delivery directly from stock actually on hand.
 - 1.10 "Delivery into consignees store or to his site" means delivered and unloaded in the specified store or depot or on the specified site in compliance with the conditions of the contract or order, the supplier bearing all risks and charges involved until the supplies are so delivered and a valid receipt is obtained.
 - 1.11 "Dumping" occurs when a private enterprise abroad market its goods on own initiative in the RSA at lower prices than that of the country of origin and which have the potential to harm the local industries in the

RSA.

- 1.12 "Force majeure" means an event beyond the control of the supplier and not involving the supplier's fault or negligence and not foreseeable. Such events may include, but is not restricted to, acts of the purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.
- 1.13 "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any bidder, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the bidder of the benefits of free and open competition.
- 1.14 "GCC" means the General Conditions of Contract.
- 1.15 "Goods" means all of the equipment, machinery, and/or other materials that the supplier is required to supply to the purchaser under the contract.
- 1.16 "Imported content" means that portion of the bidding price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or his subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs such as landing costs, dock dues, import duty, sales duty or other similar tax or duty at the South African place of entry as well as transportation and handling charges to the factory in the Republic where the supplies covered by the bid will be manufactured.
- 1.17 "Local content" means that portion of the bidding price which is not included in the imported content provided that local manufacture does take place.
- 1.18 "Manufacture" means the production of products in a factory using labour, materials, components and machinery and includes other related value-adding activities.
- 1.19 "Order" means an official written order issued for the supply of goods or works or the rendering of a service.
- 1.20 "Project site," where applicable, means the place indicated in bidding documents.
- 1.21 "Purchaser" means the organization purchasing the goods.
- 1.22 "Republic" means the Republic of South Africa.
- 1.23 "SCC" means the Special Conditions of Contract.
- 1.24 "Services" means those functional services ancillary to the supply of the goods, such as transportation and any other incidental services, such as installation, commissioning, provision of technical assistance, training, catering, gardening, security, maintenance and other such

obligations of the supplier covered under the contract.

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

2. Application

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

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

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

3. General

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

3.2 With certain exceptions, invitations to bid are only published in the Government Tender Bulletin. The Government Tender Bulletin may be obtained directly from the Government Printer, Private Bag X85, Pretoria 0001, or accessed electronically from www.treasury.gov.za

4. Standards

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

5. Use of contract documents and information; inspection.

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

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

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

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

6. Patent rights

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

7. Performance security

- 7.1 Within thirty (30) days of receipt of the notification of contract award, the successful bidder shall furnish to the purchaser the performance security of the amount specified in SCC.
- 7.2 The proceeds of the performance security shall be payable to the purchaser as compensation for any loss resulting from the supplier's failure to complete his obligations under the contract.
- 7.3 The performance security shall be denominated in the currency of the contract, or in a freely convertible currency acceptable to the purchaser and shall be in one of the following forms:
 - (a) a bank guarantee or an irrevocable letter of credit issued by a reputable bank located in the purchaser's country or abroad, acceptable to the purchaser, in the form provided in the bidding documents or another form acceptable to the purchaser; or
 - (b) a cashier's or certified cheque
- 7.4 The performance security will be discharged by the purchaser and returned to the supplier not later than thirty (30) days following the date of completion of the supplier's performance obligations under the contract, including any warranty obligations, unless otherwise specified in SCC.

8. Inspections, tests and analyses

- 8.1 All pre-bidding testing will be for the account of the bidder.
- 8.2 If it is a bid condition that supplies to be produced or services to be rendered should at any stage during production or execution or on completion be subject to inspection, the premises of the bidder or contractor shall be open, at all reasonable hours, for inspection by a representative of the Department or an organization acting on behalf of the Department.
- 8.3 If there are no inspection requirements indicated in the bidding documents and no mention is made in the contract, but during the contract period it is decided that inspections shall be carried out, the purchaser shall itself make the necessary arrangements, including payment arrangements with the testing authority concerned.
- 8.4 If the inspections, tests and analyses referred to in clauses 8.2 and 8.3 show the supplies to be in accordance with the contract requirements, the cost of the inspections, tests and analyses shall be defrayed by the purchaser.
- 8.5 Where the supplies or services referred to in clauses 8.2 and 8.3 do not comply with the contract requirements, irrespective of whether such supplies or services are accepted or not, the cost in connection with these inspections, tests or analyses shall be defrayed by the supplier.
- 8.6 Supplies and services which are referred to in clauses 8.2 and 8.3 and which do not comply with the contract requirements may be rejected.
- 8.7 Any contract supplies may on or after delivery be inspected, tested or

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

8.8 The provisions of clauses 8.4 to 8.7 shall not prejudice the right of the purchaser to cancel the contract on account of a breach of the conditions thereof, or to act in terms of Clause 23 of GCC.

9. Packing

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

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

10. Delivery and documents

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

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

11. Insurance

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

12. Transportation

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

13. Incidental services

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

- (a) performance or supervision of on-site assembly and/or commissioning of the supplied goods;
- (b) furnishing of tools required for assembly and/or maintenance of the supplied goods;
- (c) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied goods;

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

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

14. Spare parts

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

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

15. Warranty

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

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

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

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

15.5 If the supplier, having been notified, fails to remedy the defect(s) within the period specified in SCC, the purchaser may proceed to take

such remedial action as may be necessary, at the supplier's risk and expense and without prejudice to any other rights which the purchaser may have against the supplier under the contract.

- 16. Payment**
- 16.1 The method and conditions of payment to be made to the supplier under this contract shall be specified in SCC.
- 16.2 The supplier shall furnish the purchaser with an invoice accompanied by a copy of the delivery note and upon fulfillment of other obligations stipulated in the contract.
- 16.3 Payments shall be made promptly by the purchaser, but in no case later than thirty (30) days after submission of an invoice or claim by the supplier.
- 16.4 Payment will be made in Rand unless otherwise stipulated in SCC.
- 17. Prices**
- 17.1 Prices charged by the supplier for goods delivered and services performed under the contract shall not vary from the prices quoted by the supplier in his bid, with the exception of any price adjustments authorized in SCC or in the purchaser's request for bid validity extension, as the case may be.
- 18. Contract amendments**
- 18.1 No variation in or modification of the terms of the contract shall be made except by written amendment signed by the parties concerned.
- 19. Assignment**
- 19.1 The supplier shall not assign, in whole or in part, its obligations to perform under the contract, except with the purchaser's prior written consent.
- 20. Subcontracts**
- 20.1 The supplier shall notify the purchaser in writing of all subcontracts awarded under this contracts if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the supplier from any liability or obligation under the contract.
- 21. Delays in the supplier's performance**
- 21.1 Delivery of the goods and performance of services shall be made by the supplier in accordance with the time schedule prescribed by the purchaser in the contract.
- 21.2 If at any time during performance of the contract, the supplier or its subcontractor(s) should encounter conditions impeding timely delivery of the goods and performance of services, the supplier shall promptly notify the purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the supplier's notice, the purchaser shall evaluate the situation and may at his discretion extend the supplier's time for performance, with or without the imposition of penalties, in which case the extension shall be ratified by the parties by amendment of contract.
- 21.3 No provision in a contract shall be deemed to prohibit the obtaining of supplies or services from a national department, provincial department, or a local authority.
- 21.4 The right is reserved to procure outside of the contract small quantities or to have minor essential services executed if an emergency arises, the

supplier's point of supply is not situated at or near the place where the supplies are required, or the supplier's services are not readily available.

21.5 Except as provided under GCC Clause 25, a delay by the supplier in the performance of its delivery obligations shall render the supplier liable to the imposition of penalties, pursuant to GCC Clause 22, unless an extension of time is agreed upon pursuant to GCC Clause 21.2 without the application of penalties.

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

22. Penalties

22.1 Subject to GCC Clause 25, if the supplier fails to deliver any or all of the goods or to perform the services within the period(s) specified in the contract, the purchaser shall, without prejudice to its other remedies under the contract, deduct from the contract price, as a penalty, a sum calculated on the delivered price of the delayed goods or unperformed services using the current prime interest rate calculated for each day of the delay until actual delivery or performance. The purchaser may also consider termination of the contract pursuant to GCC Clause 23.

23. Termination for default

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

- (a) if the supplier fails to deliver any or all of the goods within the period(s) specified in the contract, or within any extension thereof granted by the purchaser pursuant to GCC Clause 21.2;
- (b) if the Supplier fails to perform any other obligation(s) under the contract; or
- (c) if the supplier, in the judgment of the purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the contract.

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

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

23.4 If a purchaser intends imposing a restriction on a supplier or any

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

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

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

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

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

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

24. Anti-dumping and countervailing duties and rights

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

may be due to him

25. Force Majeure

- 25.1 Notwithstanding the provisions of GCC Clauses 22 and 23, the supplier shall not be liable for forfeiture of its performance security, damages, or termination for default if and to the extent that his delay in performance or other failure to perform his obligations under the contract is the result of an event of force majeure.
- 25.2 If a force majeure situation arises, the supplier shall promptly notify the purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the purchaser in writing, the supplier shall continue to perform its obligations under the contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the force majeure event.

26. Termination for insolvency

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

27. Settlement of Disputes

- 27.1 If any dispute or difference of any kind whatsoever arises between the purchaser and the supplier in connection with or arising out of the contract, the parties shall make every effort to resolve amicably such dispute or difference by mutual consultation.
- 27.2 If, after thirty (30) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the purchaser or the supplier may give notice to the other party of his intention to commence with mediation. No mediation in respect of this matter may be commenced unless such notice is given to the other party.
- 27.3 Should it not be possible to settle a dispute by means of mediation, it may be settled in a South African court of law.
- 27.4 Mediation proceedings shall be conducted in accordance with the rules of procedure specified in the SCC.
- 27.5 Notwithstanding any reference to mediation and/or court proceedings herein,
- (a) the parties shall continue to perform their respective obligations under the contract unless they otherwise agree; and
 - (b) the purchaser shall pay the supplier any monies due the supplier.

28. Limitation of liability

- 28.1 Except in cases of criminal negligence or willful misconduct, and in the case of infringement pursuant to Clause 6;
- (a) the supplier shall not be liable to the purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the supplier to pay penalties and/or damages to the purchaser; and

- (b) the aggregate liability of the supplier to the purchaser, whether under the contract, in tort or otherwise, shall not exceed the total contract price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.
- 29. Governing language** 29.1 The contract shall be written in English. All correspondence and other documents pertaining to the contract that is exchanged by the parties shall also be written in English.
- 30. Applicable law** 30.1 The contract shall be interpreted in accordance with South African laws, unless otherwise specified in SCC.
- 31. Notices** 31.1 Every written acceptance of a bid shall be posted to the supplier concerned by registered or certified mail and any other notice to him shall be posted by ordinary mail to the address furnished in his bid or to the address notified later by him in writing and such posting shall be deemed to be proper service of such notice
- 31.2 The time mentioned in the contract documents for performing any act after such aforesaid notice has been given, shall be reckoned from the date of posting of such notice.
- 32. Taxes and duties** 32.1 A foreign supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the purchaser's country.
- 32.2 A local supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted goods to the purchaser.
- 32.3 No contract shall be concluded with any bidder whose tax matters are not in order. Prior to the award of a bid the Department must be in possession of a tax clearance certificate, submitted by the bidder. This certificate must be an original issued by the South African Revenue Services.
- 33. National Industrial Participation Programme (NIP)** 33.1 The NIP Programme administered by the Department of Trade and Industry shall be applicable to all contracts that are subject to the NIP obligation.
- 34 Prohibition of Restrictive practices** 34.1 In terms of section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, an agreement between, or concerted practice by, firms, or a decision by an association of firms, is prohibited if it is between parties in a horizontal relationship and if a bidder (s) is / are or a contractor(s) was / were involved in collusive bidding (or bid rigging).
- 34.2 If a bidder(s) or contractor(s), based on reasonable grounds or evidence obtained by the purchaser, has / have engaged in the restrictive practice referred to above, the purchaser may refer the matter to the Competition Commission for investigation and possible imposition of administrative penalties as contemplated in the Competition Act No. 89 of 1998.

- 34.3 If a bidder(s) or contractor(s), has / have been found guilty by the Competition Commission of the restrictive practice referred to above, the purchaser may, in addition and without prejudice to any other remedy provided for, invalidate the bid(s) for such item(s) offered, and / or terminate the contract in whole or part, and / or restrict the bidder(s) or contractor(s) from conducting business with the public sector for a period not exceeding ten (10) years and / or claim damages from the bidder(s) or contractor(s) concerned.

Js General Conditions of Contract (revised July 2010)