TENDER DOCUMENT

BID No: ALMT 15/2025

CONSTRUCTION OF CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5

ISSUED BY	PREPARED BY
MUNICIPAL MANAGER	**CLIENT REPRESENTATIVE**
CHIEF ALBERT LUTHULI MUNICIPALITY PRIVATE BAG X719 CAROLINA 1185	KUFANIKIWA CONSULTING (PTY) LTD 11 DERBY PLACE WESTVILLE 3629
Tell: +27 17 843 4000 Fax: +27 17 843 4001	Tell: +27 31 701 1038 Fax:

***CIDB GRADING*: 7CE OR HIGHER**

REGISTERED NAME OF TENDERER: _____

_____

TENDERED AMOUNT (**INCL. VAT**): _____

CLOSING DATE: **20th JULY 2026** TIME: **12H00**

TENDER AND CONTRACT

CONTENTS:

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Description	**Number**	**Heading**
Tendering Procedures	**Tendering Procedures**	
	T1.1	Tender Notice and Invitation to Tender (White)
	T1.2	Tender Data (Pink)
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The Contract	**Part 1: Agreement and Contract Data**	
	C1.1	Form of Offer and Acceptance (Yellow)
	C1.2	Contract Data (Yellow)
	C1.3	Forms of Securities (White)
	Part 2: Pricing Data	
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	Part 3: Scope of Work	
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Drawings		Drawings (White)

TENDERING PROCEDURES

T1.1: TENDER NOTICE AND INVITATION TO TENDER

The Municipality hereby invites reputable and well experienced service providers to submit tenders for the below-mentioned projects. The service providers must comply with the VAT Act. Tender documents will be available on e-tender, municipal website and also at Carolina Municipal Offices from 23 June 2026 at cashiers point during office hours upon payment of a non-refundable printing fee of R1 012.15 and can also be downloaded on the municipal website or e-tenders free of charge.

Ref No	Description	Evaluation Criteria	Compulsory Briefing	CIDB Grading	Closing Date
ALMT 15/2025	Construction of Carolina Bulk water Supply to Silobela, Extension 5	Functionality, the lowest acceptable tender will determine the Preferential point system to be used: 90/10	Compulsory, Date: 25 June 2026, Time: 11AM Venue: Chief Albert Luthuli Municipality, Supply Chain Boardroom.	7CE or Higher	20 July 2026 @ 12:00

Sealed envelopes must be addressed to: The Municipal Manager,
Chief Albert Luthuli Municipality
PO Box 24, CAROLINA, 1185

marked with the correct bid number or deposit it in the **'TENDER BOX'** situated at Chief Albert Luthuli Municipality Offices, 28 Church Street, CAROLINA, **no later than 12H00 on the specified closing date per tender.**

A preferential point system shall apply whereby this contract will be allocated to a bidder in accordance with the Preferential Procurement Regulation 2022 and as defined in the conditions of bid in the bid document, read in conjunction with the Preferential Procurement of Chief Albert Luthuli Municipality, where 90 points will be allocated in respect of price and 10 points in respect of the Chief Albert Luthuli Municipal objectives.

Chief Albert Luthuli Municipality reserves the right to accept and/or not to accept the lowest priced or any other tender. No late, telephonic, facsimile or e-mail tenders will be accepted.

According to the Municipality Supply Chain Regulations issued by the Minister of Finance in terms of Section 168 of the Municipal Finance Management Act, Act 56 of 2003, persons within the organs of the state, like Councillors, and other elected representatives, full time employees and other directors of the public and municipal entities are prohibited from being eligible to bid or be awarded a contract to provide any services to the municipality.

If you do not hear from the Municipality within 90 working days, please consider your tender unsuccessful.

All administrative matters may be addressed to the Supply Chain Manager Mr. J Nkosi Tel no: 017 843 4025.

Procurement Enquiries:	Mr. JA Nkosi	Email: nkosija@albertluthuli.gov.za
	Ms. AT Mamba	Email: mambaat@albertluthuli.gov.za
Technical Enquiries:	Mr. B Thela	Email: bonganit@albertluthuli.gov.za
	Ms. S Mngadi	Email: water@kufanikiwa.co.za

Employer

Municipal Manager
CHIEF ALBERT LUTHULI Municipality
PO Box 24,
CAROLINA,
1185
Website: www.albertluthuli.gov.za

T1.2 TENDER DATA

The conditions of tender are those contained in the latest edition of SANS 10845-3, *Construction Procurement – Part 3: Standard conditions of tender.*

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.

Each item of data given below is cross-referenced to the clause in SANS 10845-3 to which it mainly applies.

Clause number **TENDER DATA**

F.1.1 The employer is **Chief Albert Luthuli Local Municipality**

F.1.2 The tender documents issued by the employer comprise:

(a) The Tender Document consists of the following:

TENDER
T1: Tendering Procedures
T1.1: Tender Notice and Invitation to Tender
T1.2: Tender Data

T2: Returnable Documents
T2.1: List of Returnable Documents

CONTRACT
Part 1: Agreements and Contract Data
C1.1: Form of Offer and Acceptance
C1.2: Contract Data
C1.3: Forms of Security

Part 2: Pricing Data
C2.1: Pricing Instructions
C2.2: Bill of Quantities

Part 3: Scope of Work
C3: Scope of Work

Part 4: Site Information
C4: Site information

Drawings

The Tender Document and the drawings shall be obtained from the Employer or his authorized representative at the physical addresses stated in the Tender Notice, upon payment of the deposit stated in the Tender Notice.

F.1.4 **The employer's agent is:**

Name: Kufanikiwa Consulting (Pty) Ltd
Address: 11 Derby Place, Derby
Westville
3629
Tel: 031 701 1038
Fax:
E-mail: Water@kufanikiwa.co.za

The language for communications is English.

F.2.1 **Eligibility**

Only those tenderers who satisfy the following eligibility criteria and who provide the required evidence in their tender submissions are eligible to submit tenders and have their tenders evaluated:

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 7CE class of construction work, are eligible to have their tenders evaluated.

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 7CE class of construction work; and

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

The following tenderers who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated:

a) contractors who have a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) of 25(7A) of the Construction Industry Development Regulations, for an 7CE class of construction work; and

b) contractors registered as Potentially Emerging enterprises with the CIDB who are registered in one contractor grading designation lower than that required in terms of a) above and who satisfy the following criteria:

   1) the employer is satisfied that such a contractor has the potential to develop and qualify to be registered in that higher grade as determined in accordance with the provisions of the *CIDB Specification for Social and Economic Deliverables in Construction Works Contracts*; and

2) the employer agrees to provide the financial, management or other support that is considered appropriate to enable the contractor to successfully execute that contract.

Subcontracting

The tenderer shall achieve a minimum Contract Participation Goal (CPG) of 30% of the value of the works through subcontracting.

It is the intention of the Employer that specific portions of the Works be subcontracted to specialist subcontractors

Site visit and clarification meeting

The arrangements for a compulsory site inspection visit and clarification meeting are as stated in the Tender Notice and Invitation to Tender.

Tenderers must sign the attendance list in the name of the tendering entity. Addenda will be issued and tenders will be received only from those tendering entities appearing on the attendance list.

F.2.10 **Pricing the tender offer**

(a) Value Added Tax

The Valued Added Tax (VAT) rate shall be 15% or as otherwise provided for by legislation.

(b) The successful Tenderer shall be required to produce a VAT invoice that shall only be prepared once measurements and valuations for work done in terms of the contract offer have been agreed with the Employers agent and a certificate of payment issued.

(c) Payment of VAT to non-VAT vendors shall be processed from the month in which the Tenderers liability with the South African Revenue Services is effective.

F.2.11 **Alterations to documents**

A Tender offer shall not be considered if alterations have been made to the forms of tender data or contract data (unless such alterations have been duly authenticated by the Tenderer) or if any particulars required therein have not been completed in all respects.

F.2.12 **Alternative tenders**

No alternative tender offers will be considered

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 employer's agent.

Calculations, drawings and all other pertinent technical information and characteristics as well as modified or proposed Pricing Data must be submitted with the alternative tender offer to enable the employer to evaluate the efficacy of the alternative and its principal elements, to take a view on the degree to which the alternative complies with the employer's standards and requirements and to evaluate the acceptability of the pricing proposals. Calculations must be set out in a clear and logical sequence and must clearly reflect all design assumptions. Pricing Data must reflect all assumptions in the development of the pricing proposal.
Acceptance of an alternative tender offer will mean acceptance in principle of the offer. It will be an obligation of the contract for the 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 Pricing Data must include an amount equal to 5% of the amount tendered for the alternative offer to cover the employer's costs in confirming the acceptability of the detailed design.

F2.13 Submitting a Tender Offer

F.2.13.1 The Tenderer may not make an offer for only part of the services as defined in the Scope of Work.

F.2.13.3 Tender offers shall be submitted as an original only.
Parts of each tender offer communicated on paper shall be submitted as original, plus 0 copies.
Under no circumstances whatsoever may the tender forms be retyped or redrafted.

F.2.13.5 The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are:

Location of tender box: As mentioned on the tender advertisement.

F.2.15 **Closing time**

The closing time for submission of Tender Offers is: **12H00 on 20 July 2026, no late tenders will be accepted.** Telephonic, telegraphic, telex, electronic or emailed tenders will not be accepted.

F.2.16 **Tender Offer Validity**

The tender offer validity period is **90 days.**

F.2.23 **Certificates**

The following original or certified certificates must be provided with the tender:

- Record of Addenda to Tender Documents
- Proposed amendments and qualifications
- Preferencing Schedule: Broad Based Black Economic Empowerment Status
- Compulsory Declaration
- Municipal declaration and returnable documents
- Certificate of Attendance at a Tender Site Meeting
- Certificate of Authority of Joint Ventures/ Close corporations/ Partnership/ Company/ Sole proprietor (Certified Copies of the Identity Documents in the Case of sole proprietor)
- Registration Certificates of Entities – Joint Ventures/ Close corporations/ partnership/ Company/ Sole Proprietor
- Schedule of Tenderer's Experience
- Schedule of Key Personnel (Together with complete CV as per attached template, with **certified** qualifications)
- Format of Curriculum Vitae (CV)
- Schedule of Sub-Contractors
- Schedule of plant and equipment
- Copy of Workmen's Compensation Registration Certificate (or proof of payment of contributions in terms of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993)
- Competence Achievement Schedule
- BBBEE Certificate / Sworn Affidavit
- Form of Intent **(project specific)** to offer a Performance Guarantee
- A copy of Tax Clearance Certificate issued by the South African Revenue Services and PIN valid for three 3 months
- Execution Programme
- Contractor's Health and Safety Declaration
- Contractor's Safety Plan
- Proforma Notification form in terms of the Occupational Health and Safety Act 1993, Construction Regulations, 2014.

F.3.4 **Opening of Tender Submissions**

F.3.4.2 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.

F.3.5 **Two-Envelope System**

A two-envelope procedure will **not** be followed.

F.3.11 **Evaluation of Tender Offers**

Tenders will be evaluated for Functionality. Tenderers who qualify for Functionality will be evaluated further for Price and Preference only. Points for Functionality will not contribute to further evaluation. Tenderers who do not qualify will not be evaluated further.

Functionality will be scored out of 80 points. A Tenderer who scores less than **55%** for Functionality, that is, less than **44 points** will automatically be disqualified.

The 90/10 evaluation criteria will be used where Price will be allocated 90 points and Preference will be scored out of 10 points.

F.3.11.1 The procedure for evaluation of responsive Tender Offers will be Method 4: Financial Offer, Functionality and Preferences. The responsive tender with the highest total points as defined below is the preferred tender

F.3.11.2 The financial offer will be scored in terms of Formula 2, Option 1 of Table F.1 of SANS 294: 2004, which reads as follows:

$$Nfo = W1 \times A$$

Where:

Nfo	=	number of tender evaluation points awarded for the financial offer;
W1	=	90 points for rand value more than R50 000 000;
A	=	[1-(P-Pm)/Pm] (a negative A will be regarded as unrealistically high)

Where

Pm	=	the rand value of the lowest comparative offer;
P	=	the rand value of the Tender Offer under consideration.

F.3.11.3 (a) Functionality will include the following:

The quality criteria and maximum score in respect of each of the criteria are as follows:

COMPETENCE ACHIEVEMENT SCHEDULES

TABLE A1: PERSONNEL

TARGETED GOALS Name reference with contact details	SIMILAR PROJECTS	POINT ALLOCATION	MAX POINTS	MIN POINTS
1 x Contracts Manager (20 points)	BSc/B-Tech or higher in civil Engineering	5	20	10
	Labour Intensive Construction (LIC) method NQF Level 5	5		
	Valid Professional registration with SACPCMP or Pr. Eng or Pr. Tech Eng	5		
	At Least 10 years' experience in Construction industry	5		
1 x Site Agents	National Diploma Civil or higher in Civil Engineering	5	15	10
	Labour-Intensive Construction (LIC) NQF Level 5	5		
	At least 10 years' experience in construction industry	5		

Points can only be claimed upon submission of key personnel CVs. Certified qualifications and registrations MUST be attached. The experience of the Key Personnel must be stated clearly in the CV. Please file your POE appropriately for ease of Evaluation

TABLE A2: EXPERIENCE AND REFERENCES

TARGETED GOALS Name reference with contact details	SIMILAR PROJECTS	POINT ALLOCATION	MAX POINTS	MIN POINTS
Bulk Water Services Infrastructure System Construction and completion of a combination of bulk water projects	Five bulk water projects valued at a minimum of R50 million or more	25	**25**	**15**
	Three to Four bulk water projects valued at a minimum of R50 million or more	15		
	One to Two bulk water projects valued at a minimum of R50 million or more	5		
SUB-TOTAL: Reputation and References				

All information provided should have traceable references.
Completion Certificates or a letter from previous project Clients must be attached.

TABLE A3: FINANCIAL REFERENCES

	TARGETED GOALS	TENDERED GOAL	MAX POINTS	MIN POINTS
1	Bank rating of "C" or better (proof attached)	4	**10**	**4**
2	Proof of guarantee/letter of intent from a registered financial institution to the value of 10% of the offer shall be submitted	6		
	SUB-TOTAL: Financial references	**10**		

Note: Bank rating and proof of guarantee must be attached to qualify.

TABLE A4: PLANT AND EQUIPMENT

	TARGETED GOALS	TENDERED GOAL	POINTS CLAIMED BY TENDERER	POINTS CLAIMED BY TENDERER	ALLOCATED POINTS
1	1 TLB	3			
2	1 Tipper Trucks	2			
3	1 Mechanical Vibrating Roller Man-Operated	1			
4	Excavator	4			
	SUB-TOTAL: Plant and Equipment	**10**			

Note: Proof of ownership or letter of intent from a hiring company must be attached.

		Maximum Points to be Allocated	Minimum required points	Points Claimed by Tenderer	Allocated Points
Functionality and Quality (80 Points)	Table A1	35	20		
	Table A2	25	15		
	Table A3	10	4		
	Table A4	10	5		
	Sub Total	**80**	**44**		

The minimum number of evaluation points for Functionality & Quality is 44 points.

Scoring Quality

1. PERSONNEL (Table A1) - (Maximum 35 Points)

Point Allocation

- To achieve the full 20 points, the Contracts Manager must satisfy all four requirements. If some requirements are not met, only the corresponding points are awarded.
- The minimum acceptable score is 10 points. If the Contracts Manager scores less than 10, the tenderer will be regarded as non-responsive

2. EXPERIENCE AND REFERENCES (Table A2) - (Maximum 25 Points)

- Experience on previous contracts of a similar project/scope (over last five years)

Note: Where appointed project values received from tenderers for consideration, exceed the value of that of the Employers Agent and/or the tendered amount under consideration the maximum number of points is awarded. Should the project values be of a lower value, points will be pro-rated using the tender value against the Employers Agent estimate.

3. FINANCIAL REFERENCES (Table A3) - (Maximum 10 Points)

- Proof Of Banking Details and Bank Rating Letter of "C" or better
- Proof of guarantee/letter of intent from a registered financial institution to the value of 10% of the offer shall be submitted.

Point Allocation

0 points (0%) - Failure to Submit Details
0 points (0%) – Bank Rating of E or F
5 points (50%) – Bank Rating D
10 points (100%) – Bank Rating C or higher

4. PLANT AND EQUIPMENT (Table A4) - (Maximum 10 Points)

Points are allocated for the availability of required plant and equipment for the project (proof of ownership to be attached). There will be no pro-rated points allocated for this section.

Where letters of intent from a hiring company are be to attached, they should not be:

- Generic letters issued to satisfy the Tender requirements,
- Letters should not be dated older than 1 month prior to closing of tender,
- Frequently obtained and where the supplier is unaware of the tenderers request to supply the said equipment.

F.3.13 **Acceptance of Tender Offer**

F.3.13.1 Tender offers will only be accepted if:

a) the tenderer is registered on the Central Supplier Database (CSD) for the South African government (see https://secure.csd.gov.za/) unless it is a foreign supplier with no local registered entity

b) The tenderer must provide up-to-date municipal rates account for the company or director(s) (not older than 90 days and not in arrears for more than 90 days). In the case of a lease, the lease agreement must be accompanied by the landlord's municipal rates account;

c) the tenderer is in good standing with SARS according to the Central Supplier Database during evaluation;

d) the tenderer submits a letter of intent from an approved insurer undertaking to provide the Performance Bond to the format included in Part C1.3 of this procurement document

e) the tenderer is registered with the Construction Industry Development Board (CIDB) in an appropriate contractor grading designation;

f) the tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector;

g) the tenderer has not:

i) abused the Employer's Supply Chain Management System; or
ii) failed to perform on any previous contract and has been given a written notice to this effect;

h) the tenderer has completed the Compulsory Declaration and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process;

i) the tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer;

j) the employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2003, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely.

F.3.18 The number of paper copies of the signed contract provided by the employer is **ONE**

Annex: Standard Conditions of Tender

(As contained in Annexure F of the CIDB Standard for Uniformity in Construction Procurement)

F.1 General

F.1.1 Actions

The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in F.2 and F.3, timeously and with integrity, and behave equitably, honestly and transparently.

F.1.2 Tender Documents

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

F.1.3 Interpretation

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

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

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

a) **comparative offer means** the tenderer's financial offer after the factors of non-firm prices, all unconditional discounts and any other tendered parameters that will affect the value of the financial offer have been taken into consideration

b) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process; and

c) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels

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

F.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be read, copied and recorded. Writing shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

F.1.5 The employer's right to accept or reject any tender offer

F.1.5.1 The employer may accept or reject any variation, deviation, tender offer, or alternative tender offer, and may cancel the tender process and reject all tender offers at any time before the formation of a contract. The employer shall not accept or incur any liability to a tenderer for such cancellation and rejection, but will give written reasons for such action upon written request to do so.

F.1.5.2 The employer may not subsequent to the cancellation or abandonment of a tender process or the rejection of all responsive tender offers re-issue a tender covering substantially the same scope of work within a period of six months unless only one tender was received, and such tender was returned unopened to the tenderer.

F.2 Tenderer's obligations

F.2.1 Eligibility

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

F.2.2 Cost of tendering

Accept that the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer satisfy requirements.

F.2.3 Check documents

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

F.2.4 Confidentiality and copyright of documents

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

F.2.5 Reference documents

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

F.2.6 Acknowledge addenda

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

F.2.7 Clarification meeting

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

F.2.8 Seek clarification

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

F.2.9 Insurance

Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

F.2.10 Pricing the tender offer

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

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

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

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

F.2.11 Alterations to documents

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

F.2.12 Alternative tender offers

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

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

F.2.13 Submitting a tender offer

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

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

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

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

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

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

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

F.2.13.8 Accept that the employer will not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

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

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

F.2.15 Closing time

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

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

F.2.16 Tender offer validity

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

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

F.2.17 Clarification of tender offer after submission

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

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

F.2.18 Provide other material

F.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer’s commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment. Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employer’s request, the employer may regard the tender offer as non-responsive.

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

F.2.19 Inspections, tests and analysis

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

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

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

F.2.21 Check final draft

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

F.2.22 Return of other tender documents

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

F.2.23 Certificates

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

F.3 The employer's undertakings

F.3.1 Respond to clarification

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

F.3.2 Issue Addenda

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

F.3.3 Return late tender offers

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

F.3.4 Opening of tender submissions

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

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

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

F.3.5 Two-envelope system

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

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

F.3.6 Non-disclosure

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

F.3.7 Grounds for rejection and disqualification

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

F.3.8 Test for responsiveness

F.3.8.1 Determine, on opening and before detailed evaluation, whether each tender offer properly received:

a) complies with the requirements of these Conditions of Tender,

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

c) is responsive to the other requirements of the tender documents.

F.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer*'s* opinion, would:

a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work*,*

b) change the Employer*'s* or the tenderer's risks and responsibilities under the contract, or

c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

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

F.3.9 Arithmetical errors

F.3.9.1 Check responsive tender offers for arithmetical errors, correcting them in the following manner:

a) Where there is a discrepancy between the amounts in figures and in words, the amount in words shall govern.

b) If bills of quantities (or schedule of quantities or schedule of rates) apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.

c) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

F.3.9.2 Consider the rejection of a tender offer if the tenderer does not correct or accept the correction of his arithmetical errors in the manner described in F.3.9.1.

F.3.10 Clarification of a tender offer

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

F.3.11 Evaluation of tender offers

F.3.11.1 General

Appoint an evaluation panel of not less than three persons. Reduce each responsive tender offer to a comparative offer and evaluate it using the tender evaluation method that is indicated in the Tender Data and described below:

Method 1: Financial offer	1) Rank tender offers from the most favourable to the least favourable comparative offer. 2) Recommend highest ranked tenderer for the award of the contract, unless there are compelling and justifiable reasons not to do so.
Method 2: Financial offer and preferences	1) Score tender evaluation points for financial offer. 2) Confirm that tenderers are eligible for the preferences claimed and if so, score tender evaluation points for preferencing. 3) Calculate total tender evaluation points. 4) Rank tender offers from the highest number of tender evaluation points to the lowest. 5) Recommend tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
Method 3: Financial offer and quality	1) Score quality, rejecting all tender offers that fail to score the minimum number of points for quality stated in the Tender data. 2) Score tender evaluation points for financial offer. 3) Calculate total tender evaluation points. 4) Rank tender offers from the highest number of tender evaluation points to the lowest. 5) Recommend tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
Method 4: Financial offer, quality and preferences	1) Score quality, rejecting all tender offers that fail to score the minimum number of points for quality stated in the Tender data. 2) Score tender evaluation points for financial offer. 3) Confirm that tenderers are eligible for the preferences claimed, and if so, score tender evaluation points for preferencing. 4) Calculate total tender evaluation points. 5) Rank tender offers from the highest number of tender evaluation points to the lowest. 6) Recommend tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.

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

F.3.11.2 Scoring Financial Offers

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

N_{FO} = W_1 x A where:

N_{FO} = the number of tender evaluation points awarded for the financial offer.

W_1 = the maximum possible number of tender evaluation points awarded for the financial offer as stated in the Tender Data.

A = a number calculated using either formulas 1 or 2 below as stated in the Tender Data.

Formula	Comparison aimed at achieving	Option 1	Option 2
1	Highest price or discount	$A = (1+ \frac{(P - Pm)}{Pm})$	A = P / Pm
2	Lowest price or percentage commission / Fee	$A = (1 - \frac{(P - Pm)}{Pm})$	A = Pm / P

where:

Pm = the comparative offer of the most favourable tender offer.

P = the comparative offer of tender offer under consideration.

F.3.11.3 Scoring quality (functionality)

Score quality in each of the categories stated in the Tender Data and calculate total score for quality.

F.3.12 Insurance provided by the employer

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

F.3.13 Acceptance of tender offer

F.3.13.1 Accept tender offer only if the tenderer complies with legal requirements stated in the Tender Data.

F.3.13.2 Notify the successful tenderer of the employer's acceptance of his tender offer by completing and returning one copy of the form of offer and acceptance before the expiry of the validity period stated in the tender data, or agreed additional period. Providing the form of offer and acceptance does not contain any qualifying statements, it will constitute the formation of a contract between the employer and the successful tenderer as described in the form of offer and acceptance.

F.3.14 Notice to unsuccessful tenderers

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

F.3.15. Prepare contract documents

If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

a) addenda issued during the tender period,

b) inclusion of some of the returnable documents,

c) other revisions agreed between the employer and the successful tenderer, and

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

F.3.16 Issue final contract

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

F.3.17 Complete adjudicator's contract

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

F.3.18 Provide copies of the contracts

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

RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS

The tenderer must complete the following returnable documents:

1. Returnable Schedules required only for tender evaluation purposes

FORM A1. Invitation to Bid (**MBD1**)
FORM A2.1 Record of Addenda to Tender Documents
FORM A2.2 Proposed amendments and qualifications
FORM A3.1. Preferencing Schedule: B-BBEE Status (**MBD 6.1**)
FROM A3.2. B-BBEE Compulsory Declaration (In case of a JV)
FORM A4. Compulsory Enterprise Questionnaire
FORM A5. Certificate of Attendance at a Tender Site Meeting
FORM A6. Certificate of Authority of Joint Ventures/ Close corporations/ Partnership/ Company/ Sole proprietor (Certified Copies of the Identity Documents in the Case of sole proprietor)
FORM A7. Registration Certificate of Entity and Bank rating
FORM A8. Schedule of Tenderer's Experience
FORM A9.1. Schedule of Key Personnel
FORM A9.2. Format of Curriculum Vitae (CV)
FORM A10. Schedule of Sub-Contractors
FORM A11. Schedule of plant and equipment
FORM A12. Certificate of Registration with CIDB
FORM A13. Declaration certificate for local production and content for designated sectors (**MBD 6.2**)
FORM A14. Competence Achievement Schedule
FORM A15. Registration on National Treasury Central Supplier Database
FORM A16. Form of Intent to offer a Performance Guarantee
FORM A17. An Original Tax Clearance Certificate issued by the South African Revenue Services (**MBD 2**)
FORM A18 Declaration of Interest (**MBD 4**)
FORM A19. Declaration for Procurement above R10 Million (**MBD 5**)
FORM A20. Declaration of Bidder's Past Supply Chain Management Practices (**MBD8**)
FORM A21. Certificate of Independent Bid Determination (**MBD 9**)

2. Other documents that will be incorporated into the contract

FORM B1. Authority of Signatory
FORM B2. Execution Programme
FORM B3. Contractor's Health and Safety Declaration
FORM B4. APPLICATION FOR A PERMIT TO DO CONSTRUCTION WORK, Regulation 3(2) of Construction Regulations, 2014.

FORM A1: PART A - INVITATION TO BID

MBD 1

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF CHIEF ALBERT LUTHULI LOCAL MUMICIPALITY					
BID NUMBER:	**ALMT15/2025**	CLOSING DATE:	**20/07/2026**	CLOSING TIME:	**12H00**
DESCRIPTION	**CONSTRUCTION OF CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5**				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM.					

BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT *(STREET ADDRESS)*

Chief Albert Luthuli Municipal Offices, 28 Church Street, Carolina					
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					
TAX COMPLIANCE STATUS	TCS PIN:		**OR**	CSD No:	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE [TICK APPLICABLE BOX]	☐ Yes ☐ No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT	☐ Yes ☐ No	
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]					
ARE YOU THE ACCREDITED REPRESENTATIVE **IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?**	☐Yes ☐No [IF YES ENCLOSE PROOF]		ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES /WORKS OFFERED?**	☐Yes ☐No [IF YES, ANSWER PART B:3]	
TOTAL NUMBER OF ITEMS OFFERED			**TOTAL BID PRICE**	**R**	
SIGNATURE OF BIDDER	……		**DATE**		
CAPACITY UNDER WHICH THIS BID IS SIGNED					

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:		**TECHNICAL INFORMATION MAY BE DIRECTED TO:**	
DEPARTMENT	SUPPLY CHAIN UNIT	CONTACT PERSON	Mr. M. Mlotshwa
CONTACT PERSON	Mr. JA Nkosi	TELEPHONE NUMBER	031 701 1038
TELEPHONE NUMBER	017 843 4084	FACSIMILE NUMBER	
FACSIMILE NUMBER		E-MAIL ADDRESS	Water@kufanikiwa.co.za
E-MAIL ADDRESS			

FORM A1: PART B - TERMS AND CONDITIONS FOR BIDDING

MBD 1(Cont.)

1.	**BID SUBMISSION:**
1.1.	BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
1.2.	**ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED–(NOT TO BE RE-TYPED) OR ONLINE**
1.3.	THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.
2.	**TAX COMPLIANCE REQUIREMENTS**
2.1	BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
2.2	BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.
2.3	APPLICATION FOR THE TAX COMPLIANCE STATUS (TCS) CERTIFICATE OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA.
2.4	FOREIGN SUPPLIERS MUST COMPLETE THE PRE-AWARD QUESTIONNAIRE IN PART B:3.
2.5	BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
2.6	IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
2.7	WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.
3.	**QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS**
3.1.	IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)? ☐ YES ☐ NO
3.2.	DOES THE ENTITY HAVE A BRANCH IN THE RSA? ☐ YES ☐ NO
3.3.	DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA? ☐ YES ☐ NO
3.4.	DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA? ☐ YES ☐ NO
3.5.	IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION? ☐ YES ☐ NO
	IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.
NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE.

SIGNATURE OF BIDDER: ……

CAPACITY UNDER WHICH THIS BID IS SIGNED: ……

DATE:

FORM A2.1: Record of Addenda to tender documents

We confirm the following communications received from the Employer OR Employers Agent before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer		
	Date	**Title or Details**
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Attach additional pages if more space is required.

Signed ---------- Date _____

Name ---------- Position _____

Tenderer_____

FORM A2.2: Proposed amendments and qualifications

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.

Page	Clause or item	Proposal

Signed _____ Date_____

Name_____ Position_____

*Tenderer*_____

MBD 6.1

FORM A3.1: Preferencing schedule: Municipal Objectives

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.**

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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 Preference Points System to be applied (tick whichever is applicable).

☐ The applicable preference point system for this tender is the **80/20** preference point system.

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

☐ 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 shall be awarded for:

1.3.1 Price; and

1.3.2 Municipal Objectives

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

CHOOSE APPLICABLE PREFERENCE POINT SCORING SYSTEM	☐ 80/20	☒ 90/10
PRICE	80	90
MUNICIPAL OBJECTIVES	20	10
Total points for Price and Specific Goals	100	100

1.5 Breakdown Allocation of Specific Goals Points

1.5.1 For Procurement transactions with rand value greater than R2 000.00 and up to R1 Million (Inclusive of all applicable taxes), the specific goals as listed in table 1 below are applicable.

All Acquisitions
Table 1

Serial No	Specific Goals	Preference Points allocated out of 20	Documentation to be submitted by bidders to validate their claim for points
1.	An EME or QSE which is at least 51% owned by **black people**	10	• ID Copy Or • SANAS Accredited BBBEE Certificate or sworn affidavit where applicable Or • CSD Report Or • CIPC (company registration)
2.	**Located** in a specific Local Municipality or District Municipality or Metro or Province area for work to be done or services to be rendered in that area	2	• ID Copy (Mandatory) • Office Municipal Rates Statement Or • Permission To Occupy from local chief in case of rural areas (PTO) Or • Lease Agreement
3.	An EME or QSE which is at least 51% owned by **women**	4	• ID Copy Or • CSD Report Or • CIPC (company registration)
4.	An EME or QSE which is at least 51% owned by people with **disability**	2	• ID Copy (Mandatory) Or • Medical Certificate Or • South African Social Security Agency (SASSA) registration Or • National Council for Persons with Physical Disability in South Africa registration (NCPPDSA) Or • CSD Report Or • CIPC (company registration)
5.	An EME or QSE which is at least 51% owned by **youth**.	2	• ID Copy Or • CSD Report Or • CIPC (company registration)

1.5.2 **For procurement transactions with rand value greater than R1 Million and up to R50 Million (Inclusive of all applicable taxes) the specific goals as listed in table 2 below are applicable:**

All Acquisitions
Table 2

Serial No	Specific Goals	Preference Points allocated out of 20	Documentation to be submitted by bidders to validate their claim for points
1.	An EME or QSE or any entity which is at least 51% owned by **Historically Disadvantaged Individuals** (HDI)	10	• ID Copy Or • SANAS Accredited BBBEE Certificate or sworn affidavit where applicable Or • CSD Report Or • CIPC (company registration)
2.	**Located** in a specific Local Municipality or District Municipality or Metro or Province area for work to be done or services to be rendered in that area	2	• ID Copy (Mandatory) Or • Office Municipal Rates Statement Or • Permission To Occupy from local chief in case of rural areas (PTO) Or • Lease Agreement
3.	An EME or QSE or any entity which is at least 51% owned by **women**	4	• ID Copy Or • CSD Report Or • CIPC (company registration)

4.	An EME or QSE or any entity which is at least 51% owned by people with **disability**	2	• ID Copy (Mandatory) Or • Medical Certificate Or • South African Social Security Agency (SASSA) registration Or • National Council for Persons with Physical Disability in South Africa registration (NCPPDSA) Or • CSD Report Or • CIPC (company registration)
5.	An EME or QSE or any entity which is at least 51% owned by **youth**.	2	• ID Copy Or • CSD Report Or • CIPC (company registration)

1.5.3 For procurement transactions with rand value greater than R50 Million (Inclusive of all applicable taxes) the specific goals as listed in table 3 below are applicable

All Acquisitions
Table 3

Serial No	Specific Goals	Preference Points allocated out of 10	Documentation to be submitted by bidders to validate their claim for points
1.	An EME or QSE or any entity which is at least 51% owned by **Historically Disadvantaged Individuals** (HDI)	4	• ID Copy Or • SANAS Accredited BBBEE Certificate or sworn affidavit where applicable Or • CSD Report Or • CIPC (company registration)
2.	**Located** in a specific Local Municipality or District Municipality or Metro or Province area for work to be done or services to be rendered in that area	2	• ID Copy (Mandatory) Or • Office Municipal Rates Statement Or • Permission To Occupy from local chief in case of rural areas (PTO) Or • Lease Agreement
3.	An EME or QSE or any entity which is at least 51% owned by **women**	2	• ID Copy • CSD Report Or • CIPC (company registration)
4.	An EME or QSE or any entity which is at least 51% owned by people with **disability** OR An EME or QSE or any entity which is at least 51% owned by **youth**.	2	• ID Copy (Mandatory) Or • Medical Certificate Or • South African Social Security Agency (SASSA) registration Or • National Council for Persons with Physical Disability in South Africa registration (NCPPDSA) • ID Copy • CSD Report Or • CIPC (company registration)

1.6 Failure on the part of the tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals, if the service provider/ tenderer did not submit proof or documentation required to claim for specific goals will be interpreted to mean that preference points for specific goals are not claimed.

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

2. DEFINITIONS

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

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

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

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

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

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

3.1.1. THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

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

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

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

Where:

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

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

3.2.1. POINTS AWARDED FOR PRICE

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

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

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

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 1,2 and 3 above as may be supported by proof/ documentation stated in the conditions of this tender:

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

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

(b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,

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

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

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

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

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by the organ of state)	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)
1. An EME or QSE or any entity which is at least 51% owned by **Historically Disadvantaged Individuals** (HDI)	4	10		
2. **Located** in a specific Local Municipality or District Municipality or Metro or Province area for work to be done or services to be rendered in that area	2	2		
3. An EME or QSE or any entity which is at least 51% owned by **women**	2	4		
4. An EME or QSE or any entity which is at least 51% owned by people with **disability** **or**	2	2		
5. An EME or QSE or any entity which is at least 51% owned by **youth**.* (only one specific goal is applicable between specific goal number 4 and specific goal number 5 under 90/10 Preference Point System)	2	2		

**Note: ***in respect of the 90/10 point system a selection of either disability or youth may be made with an allocation of 2 points for either of them.

5. DECLARATION WITH REGARD TO COMPANY/FIRM

5.1. Name of company/firm…….

5.2. Company registration number: ……...

5.3. TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

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

i) The information furnished is true and correct;

ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;

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

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

(a) disqualify the person from the tendering process;

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

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

(e) forward the matter for criminal prosecution, if deemed necessary.

.....

SIGNATURE(S) OF TENDERER(S)

SURNAME AND NAME: .....

DATE: .....

ADDRESS: .....

.....

.....

8. SUB-CONTRACTING

8.1 Will any portion of the contract be sub-contracted?

YES		**NO**	

8.1.1 If yes, indicate:

i) what percentage of the contract will be subcontracted? _____ %

ii) the name of the sub-contractor? _____

iii) The B-BBEE status level of the sub-contractor? _____

iv) whether the sub-contractor is an EME?

YES		**NO**	

9. DECLARATION WITH REGARD TO COMPANY/FIRM

9.1 Name of firm:

_____

9.2 VAT registration number

_____

9.3 Company Registration number

_____

9.4 **TYPE OF FIRM** (Tick Applicable Box)

	Partnership/Joint venture / consortium
	One Person business / sole propriety
	Close Corporation
	Company
	(Pty) Ltd
	Other: Specify

9.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

_____

_____

9.6 MUNICIPAL INFORMATION

Municipality where business is situated

_____

Registered Account Number

_____

Stand Number

_____

9.7 TOTAL NUMBER OF YEARS THE COMPANY/FIRM HAS BEEN IN BUSINESS? _____

9.8 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBEE status level of contribution indicated in paragraph 7 of the foregoing certificate, qualifies the company / firm for the preference(s) shown and I / we acknowledge that:

The information furnished is true and correct;

(ii) The preference points claimed are in accordance with the 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 paragraph 7, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

(iv) If the B-BBEE status level of contribution has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –

(a) disqualify the person from the bidding process;

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

(d) restricted the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, 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

WITNESSES:

1. ……

2. ……..

……

SIGNATURE(S) OF BIDDER(S)

ADDRESS:

_____

_____

_____

FORM A3.2: B-BBEE Compulsory Declaration (In case of a JV)

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:	*State Not Registered if not registered for VAT*

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** *(tick appropriate column)*	
		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 of 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_____

*Enterprise name*_____

NOTE 1 The Standard Conditions of Tender contained in SANS 10845-3 prohibits anticompetitive practices (clause 3.1) and requires that tenderers avoid conflicts of interest, only submit a tender offer if the tenderer or any of his principals is not under any restriction to do business with 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.

FORM A4: COMPULSORY ENTERPRISE QUESTIONNAIRE

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

Section 1: Name of enterprise: . . . . . .

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

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

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	**Identity number***	**Personal income tax number***

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

Section 5: Particulars of companies and close corporations

Company registration number . . . . . .

Close corporation number . . . . . .

Tax reference number . . . . . .

Section 6: Record of service of the state

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

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

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

Name of sole proprietor, partner, director, manager, principal shareholder or stakeholder	**Name of institution, public office, board or organ of state and position held**	**Status of service (tick appropriate column)**	
		current	**Within last 12 months**

*insert separate page if necessary

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

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

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

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

*insert separate page if necessary

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

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

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

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

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

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

Signed _____ Date .....

Name _____

Identity number

Position _____ .....

Enterprise name .....

FORM A5: Certificate of Attendance at a tender site meeting

I / We acknowledge that the tender briefing was attended by a company representative able to relay the presentation of the works and/ or matters incidental to doing the works in the tender document in order for me/ us to take account of everything necessary when compiling our rates and prices included in the tender.

I/we acknowledge that the attendance register will be used to confirm our company's presence and if found to be absent, will lead to our tender being disqualified.

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

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

FORM A6: Certificate of Authority of Joint Ventures/ Close corporations/ Partnership/ Company/ Sole proprietor (Certified Copies of the Identity Documents in the Case of sole proprietor)

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

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

(I) CERTIFICATE OF COMPANY

I, ……, chairperson of the Board of Directors of ....., hereby confirm that by resolution of the Board (copy attached) taken on ……..... 20....., Mr/Ms ....., acting in the capacity of……....., was authorized to sign all documents in connection with the tender for Contract No. ALMT15/2025 and any contract resulting from it on behalf of the company.

Chairman: .....

As Witnesses: 1.....

2.....

Date: .....

(II) CERTIFICATE FOR CLOSE CORPORATION

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

..... hereby authorize Mr/Ms ……..... , acting in the capacity of....., to sign all documents in connection with the tender for Contract No. ALMT15/2025 and any contract resulting from it on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

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

(III) CERTIFICATE FOR PARTNERSHIP

We, the undersigned, being the key partners in the business trading as, ...……..…., hereby authorize Mr/Ms .....…… ,

acting in the capacity of …….. , to sign all documents in connection with the tender for Contract No. ALMT15/2025 and any contract resulting from it on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

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

(IV) CERTIFICATE FOR JOINT VENTURE

This Returnable Schedule is to be completed by joint ventures.

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

NAME OF FIRM	ADDRESS	DULY AUTHORISED SIGNATORY
Lead partner		Signature. . . . . . Name …… Designation…… ……
		Signature. . . . . . Name …… Designation…… ……
		Signature. . . . . . Name …… Designation…… ……
		Signature. . . . . . Name …… Designation…… ……

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

(V) CERTIFICATE FOR SOLE PROPRIETOR

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

trading as …….....

Signature of Sole owner: .....

As Witnesses: Date:

1..... .....

2. ....

FORM A7: Registration Certificate of an Entity

Important note to Tenderer:

1. ***Registration Certificates for Companies, Close Corporations and Partnerships, and ID documents for Sole Proprietors, must be attached here. In the case of a Joint Venture, a copy of a duly signed Joint Venture Agreement must be included***

2. ***Bank letter to be attached here. To be specific to this project and not older than 30 days. The letter shall state the tenderers ability to finance working capital requirements before the first claim is to be paid by the client.***

FORM A8: Schedule of the Tenderer's Experience

EMPLOYER: CONTACT PERSON AND TELEPHONE NUMBER	CONSULTING ENGINEER: CONTACT PERSON AND TELEPHONE NUMBER	NATURE OF WORK	VALUE OF WORK (inclusive of VAT)	DATE COMPLETED OR EXPECTED TO BE COMPLETED

Signed..... Date .....

Name ..... Position.....

Tenderer
.....

FORM A9.1: Schedule Key Personnel

In terms of the Project Specification and the Conditions of Tender, unskilled workers may only be brought in from outside the local community if such personnel are not available locally.

The Tenderer shall list below the personnel which he intends to utilize on the Works, including key personnel which may have to be brought in from outside if not available locally.

CATEGORY OF EMPLOYEE	NUMBER OF PERSONS					
	KEY PERSONNEL, PART OF THE CONTRACTOR'S ORGANISATION		KEY PERSONNEL TO BE IMPORTED IF NOT AVAILABLE LOCALLY		UNSKILLED PERSONNEL TO BE RECRUITED FROM LOCAL COMMUNITY	
	HDI	NON-HDI	HDI	NON-HDI	HDI	NON-HDI
Site Agent, Project Managers						
Foremen, Quality Control and Safety Personnel						
Technicians, Surveyors, etc						
Artisans and other Skilled workers						
Plant Operators						
Unskilled Workers						
Others:						

Signed ---------- Date ----------

Name ---------- Position ----------

Tenderer ----------

FORM A9.2: Format of Curriculum Vitae of Key Personnel

Provide separate forms for each position listed in the Form: Key Personnel

Project Manager

Name:	**Date of birth:**
Profession:	**Nationality:**
Qualifications:	
Professional Registration Number:	
Name of Employer (firm):	
Current position:	**Years with firm:**
Employment Record:	
Experience Record Pertinent to Required service:	

Certification:

I, the undersigned, certify that, to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience.

.....…… …….....
Signature of person named in the schedule *Date*

Provide separate forms for each position listed in the Form: Key Personnel

Construction Supervisor

Name:	**Date of birth:**
Profession:	**Nationality:**
Qualifications:	
Professional Registration Number:	
Name of Employer (firm):	
Current position:	**Years with firm:**
Employment Record:	
Experience Record Pertinent to Required service:	

Certification:

I, the undersigned, certify that, to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience.

.....…… ……......
Signature of person named in the schedule *Date*

Provide separate forms for each position listed in the Form: Key Personnel

Safety Officer

Name:	**Date of birth:**
Profession:	**Nationality:**
Qualifications:	
Professional Registration Number:	
Name of Employer (firm):	
Current position:	**Years with firm:**
Employment Record:	
Experience Record Pertinent to Required service:	

Certification:

I, the undersigned, certify that, to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience.

.....…… …….....
Signature of person named in the schedule *Date*

FORM A10: Schedule of Proposed Subcontractors

We notify you that it is our intention to employ the following Subcontractors for work in this contract.

Tenderers or contractors must submit proof of subcontracting arrangement between the main tenderer and the subcontractor.

Tenders that do not meet subcontracting requirements are considered as being not acceptable tenders and must be disqualified and may not be considered for further evaluation or award.

Name and address of proposed Subcontractor	Nature and extent of work	Previous experience with Subcontractor.

Signed ---------- Date _____

Name ---------- Position _____

Tenderer ----------

FORM A11: Schedule of Plant and Equipment

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

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

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

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

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

Signed ..... Date .....

Name ..... Position .....

Tenderer.....

FORM A12: Certificate of Registration with CIDB

The tenderer shall provide a printed copy of the Active Contractor's Listing off the CIDB website. (www.cidb.org.za). 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 F.2.1). 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: .....

MBD 6.2

FORM A13: DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT FOR DESIGNATED SECTORS

This Municipal Bidding Document (MBD) 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, 2011 and 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, 2011 (Regulation 9) makes provision for the promotion of local production and content.

1.2. Regulation 9.(1) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

1.3. Where necessary, for bids 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 the South African Reserve Bank (SARB) at 12:00 on the date of advertisement of the bid as required in paragraph 4.1 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.

1.6. A bid may be disqualified if –

(a) this Declaration Certificate and the Annex C (Local Content Declaration: Summary Schedule) are not submitted as part of the bid documentation; and

(b) the bidder fails to declare that the Local Content Declaration Templates (Annex C, D and E) have been audited and certified as correct.

2. Definitions

2.1. **"bid"** includes written price quotations, advertised competitive bids or proposals;

2.2. **"bid price"** price offered by the bidder, excluding value added tax (VAT);

2.3. **"contract"** means the agreement that results from the acceptance of a bid by an organ of state;

2.4. **"designated sector"** means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production, where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;

2.5. **"duly sign"** means a Declaration Certificate for Local Content that has been signed by the 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).

2.6. **"imported content"** means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and which costs are inclusive of the costs abroad (this includes labour and intellectual property costs), plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;

2.7. **"local content"** means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;

2.8. **"stipulated minimum threshold"** means that portion of local production and content as determined by the Department of Trade and Industry; and

2.9. **"sub-contract"** means the primary contractor's assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract.

3. 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:

Description of services, works or goods	Stipulated minimum threshold
_____	_____%
_____	_____%
_____	_____%

4. Does any portion of the services, works or goods offered have any imported content?
(***Tick applicable box***)

YES		NO	

4.1 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 the SARB for the specific currency at 12:00 on the date of advertisement of the bid.
The relevant rates of exchange information is accessible on **www.reservebank.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.

5. Were the Local Content Declaration Templates (Annex C, D and E) audited and certified as correct?
(***Tick applicable box***)

YES		NO	

5.1. If yes, provide the following particulars:
(a) Full name of auditor: ……
(b) Practice number: ……..
(c) Telephone and cell number: …….
(d) Email address: ……..

(Documentary proof regarding the declaration will, when required, be submitted to the satisfaction of the Accounting Officer / Accounting Authority)

6. 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 Accounting Officer / Accounting Authority 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 Municipality / Municipal Entity):
.....

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
(ii) the declaration templates have been audited and certified to be correct.

(c)The local content percentages (%) indicated below has been calculated using the formula given in clause 3 of SATS 1286:2011, the rates of exchange indicated in paragraph 4.1 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 4.1 above and the information contained in Declaration D and E.

(d) I accept that the Procurement Authority / Municipality /Municipal Entity 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 / Municipal / Municipal Entity imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement Regulations, 2011 promulgated under the Preferential Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____ **DATE:** _____

WITNESS No. 1 _____ **DATE:** _____

WITNESS No. 2 _____ **DATE:** _____

FORM A14: Competence Achievement Schedules

The quality criteria and maximum score in respect of each of the criteria are as follows:

COMPETENCE ACHIEVEMENT SCHEDULES

TABLE A1: PERSONNEL

TARGETED GOALS Name reference with contact details	SIMILAR PROJECTS	POINT ALLOCATION	MAX POINTS	MIN POINTS
1 x Contracts Manager (20 points)	BSc/B-Tech or higher in civil Engineering	5	20	10
	Labour Intensive Construction (LIC) method NQF Level 5	5		
	Valid Professional registration with SACPCMP or Pr Eng or Pr Tech Eng	5		
	At Least 10 years' experience in Construction industry	5		
1 x Site Agents	National Diploma Civil or higher in Civil Engineering	5	15	10
	Labour-Intensive Construction (LIC) NQF Level 5	5		
	At least 10 years' experience in construction industry	5		

Points can only be claimed upon submission of key personnel CVs. Certified qualifications and registrations MUST be attached. The experience of the Key Personnel must be stated clearly in the CV. Please file your POE appropriately for ease of Evaluation

TABLE A2: EXPERIENCE AND REFERENCES

TARGETED GOALS Name reference with contact details	SIMILAR PROJECTS	POINT ALLOCATION	MAX POINTS	MIN POINTS
Bulk Water Services Infrastructure System Construction and completion of a combination of bulk water projects	Five bulk water projects valued at a minimum of R50 million or more	25	**25**	**15**
	Three to Four bulk water projects valued at a minimum of R50 million or more	15		
	One to Two bulk water projects valued at a minimum of R50 million or more	5		
SUB-TOTAL: Reputation and References				

All information provided should have traceable references.
Completion Certificates or a letter from previous project Clients must be attached.

TABLE A3: FINANCIAL REFERENCES

	TARGETED GOALS	TENDERED GOAL	MAX POINTS	MIN POINTS
1	Bank rating of "C" or better (proof attached)	4	**10**	**4**
2	Proof of guarantee/letter of intent from a registered financial institution to the value of 10% of the offer shall be submitted	6		
	SUB-TOTAL: Financial references	**10**		

Note: Bank rating and proof of guarantee must be attached to qualify.

TABLE A4: PLANT AND EQUIPMENT

	TARGETED GOALS	TENDERED GOAL	POINTS CLAIMED BY TENDERER	POINTS CLAIMED BY TENDERER	ALLOCATED POINTS
1	1 TLB	3			
2	1 Tipper Trucks	2			
3	1 Mechanical Vibrating Roller Man-Operated	1			
4	Excavator	4			
	SUB-TOTAL: Plant and Equipment	**10**			

Note: Proof of ownership or letter of intent from a hiring company must be attached.

TABLE A5: SUPPLY CHAIN POLICY USING 90/10 PREFERENCE POINT SYSTEM

		Maximum Points to be Allocated	Minimum required points	Points Claimed by Tenderer	Allocated Points
Functionality and Quality (80 Points)	Table A1	35	20		
	Table A2	25	15		
	Table A3	10	4		
	Table A4	10	5		
	Sub Total	**80**	**44**		

The minimum number of evaluation points for Functionality & Quality is 44 points.

Scoring Quality

1. PERSONNEL (Table A1) - (Maximum 35 Points)

Point Allocation

- To achieve the full 20 points, the Contracts Manager must satisfy all four requirements. If some requirements are not met, only the corresponding points are awarded.
- The minimum acceptable score is 10 points. If the Contracts Manager scores less than 10, the tenderer will be regarded as non-responsive

2. EXPERIENCE AND REFERENCES (Table A2) - (Maximum 25 Points)

- Experience on previous contracts of a similar project/scope (over last five years)

Note: Where appointed project values received from tenderers for consideration, exceed the value of that of the Employers Agent and/or the tendered amount under consideration the maximum number of points is awarded. Should the project values be of a lower value, points will be pro-rated using the tender value against the Employers Agent estimate.

3. FINANCIAL REFERENCES (Table A3) - (Maximum 10 Points)

- Proof Of Banking Details and Bank Rating Letter of "C" or better
- Proof of guarantee/letter of intent from a registered financial institution to the value of 10% of the offer shall be submitted.

Point Allocation

0 points (0%) - Failure to Submit Details
0 points (0%) – Bank Rating of E or F
5 points (50%) – Bank Rating D
10 points (100%) – Bank Rating C or higher

4. PLANT AND EQUIPMENT (Table A4) - (Maximum 10 Points)

Points are allocated for the availability of required plant and equipment for the project (proof of ownership to be attached). There will be no pro-rated points allocated for this section.

Where letters of intent from a hiring company are be to attached, they should not be:

- Generic letters issued to satisfy the Tender requirements,
- Letters should not be dated older than 1 month prior to closing of tender,
- Frequently obtained and where the supplier is unaware of the tenderers request to supply the said equipment.

FORM A15: Registration on National Treasury Central Supplier Database

The tenderer shall provide a printed copy of the Active Supplier Listing on the National Treasury Central Supplier Database. (www.treasury.gov.za). Tenderers who are not registered on the Central Supplier Database should attach proof of their application for registration. In the case of a Joint Venture, a printed copy of the Active Supplier Listing must be provided for each member of the Joint Venture.

Name of Contractor: .....

Central Supplier Database Supplier Number: .....

Expiry Date: .....

FORM A16: Form of Intent to Provide a Performance Guarantee

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

PRO-FORMA FOR A PERFORMANCE GUARANTEE

PERFORMANCE GUARANTEE

Employer: (N*ame and Address*) ……

……

Bid No: ……

(*Contract title*) ……..

WHEREAS
……..

(hereinafter referred to as "the Employer") entered into, a Contract with

……
.

(hereinafter called "the Contactor") on the ……..……..….day of …….……. 20……..
for the construction of (*Contract Title*)

……
.

at
……...

AND WHEREAS it is provided by such Contract that the Contractor shall provide the Employer with security by way of a guarantee for the due and faithful fulfilment of such Contract by the Contractor;

AND WHEREAS …… (hereinafter referred to as "the Guarantor") Has/have at the request of the Contractor, agreed to give such guarantee;

NOW THEREFORE WE,
……..

Do hereby guarantee and bind ourselves jointly and severally as Guarantor and Co-Principal Debtors to the Employer under renunciation of the benefits of division and exclusion for the due and faithful performance by the Contractor of all the terms and conditions of the said Contract, subject to the following conditions:

Pro-forma

1. The Employer shall, without reference and/or notice to us, have complete liberty of action to act in any manner authorized and/or contemplated by the terms of the said Contract, and/or to agree to any modifications, variations, alterations, directions or extensions of the Completion Data of the Works under the said Contract, and that its rights under this guarantee shall in no way be prejudiced nor our liability hereunder be affected by reason of any steps which the Employer may take under such Contract, or of any modification, variation, alterations of the Completion Date which the Employer may make, give, concede or agree to under the said Contract.

2. This guarantee shall be limited to the payment of a sum of money

3. The Employer shall be entitled, without reference to us, to release any guarantee held by it, and to give time to or compound or make any other arrangement with the Contractor. However, upon receipt by us of an authenticated copy of the Certificate of Completion in terms of the Contract, the amount of liability shall be reduced by 50%, which shall be in force until the issue of the Final Approval Certificate at expiry of the Defects Liability Period

4. This guarantee shall remain in full force and effect until the issue of the Certificate of Completion in terms of the Contract, unless we are advised in writing by the Employer before the issue of the said Certificate of his intention to institute claims, and the particulars thereof, in which event this guarantee shall remain in full force and effect until all such claims have been paid or liquidated.

5. Our total liability hereunder shall not exceed the sum of

   ……..

   ……

   ……..….(in words)

   R …….. (in figures)

   (10 % of the tender sum) which amount I/we agree to hold at your disposal.

6. The Guarantor reserves the right to withdraw from this guarantee by depositing the Guaranteed Sum with the beneficiary, whereupon the Guarantor's liability hereunder shall cease.

   I/We declare that I/we, on behalf of the Guarantor, waive the legal exceptions available to a guarantor and undertake to pay the said amount or such portion thereof as may be demanded, immediately on receipt of a written demand from you.

   A certificate under your hand shall be sufficient and satisfactory evidence as to the amount of the Guarantor's liability for the purpose of enabling provisional sentence or any similar relief to be obtained against the Guarantor.

   This guarantee is neither negotiable nor transferable, and must be surrendered to the Guarantor in the event of the full amount of the Guarantee being paid to the Employer.

Pro-forma

7. I/We hereby choose our address for the serving of all notices for all purposes arising here from as

……

……

IN WITNESS WHEREOF this guarantee has been executed by us at
……

on this …… day of …… 20.....

As witnesses:

1. …… Signature ……

2. …… . Signature ……

Duly authorized to sign on behalf of (*Guarantor*)……

Address

……..

……

……

Pro-forma

MBD 2

FORM A17: Tax Clearance Certificate

Tax Clearance Certificate obtained from SARS to be inserted here.

IMPORTANT NOTES:

1 The tenderer shall attach to this page an original current Tax Clearance certificate and VAT Registration certificate which is valid for the duration of the Tender offer validity period and which shall be obtained by the tenderer from the South African Revenue Service (SARS).

In the event of a joint venture, each member shall comply with the above requirement.

Where such certificates are no longer issued by SARS the tenderer shall complete the declaration below.

I, ... (name)

the undersigned in my capacity as ..... (position)

on behalf of ..... (name of company)

herewith grant consent that SARS may disclose to Chief Albert Luthuli Local Municipality our tax compliance status. For this purpose, our unique security personal identification number (PIN) is .....

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

Failure to submit a valid Tax Clearance Certificate ISSUED BY SARS WITH YOUR BID DOCUMENT AT THE TIME OF CLOSING will invalidate the tender.

(ST 5.1) March 1999

APPLICATION FORM FOR TAX CLEARANCE CERTIFICATE

(IN RESPECT OF TENDER)

1. NAME OF TAXPAYER/TENDERER: ……..…….....

2. TRADE NAME: ……..……..…

3. IDENTIFICATION No. (if applicable) : | | | | | | | | | | | | | |

4. COMPANY/CLOSE CORPORATION REG No. : | | | | | | | | | | |

5. INCOME TAX REFERENCE No. : | | | | | | | | | | |

6. VAT REGISTRATION No. : | | | | | | | | | | |

7. PAYE EMPLOYERS REG No. (if applicable) : | | | | | | | | | | |

NB : Copy of the tender request must be attached to this application.

CONTACT PERSON REQUIRING TAX CLEARANCE CERTIFICATE:

SIGNATURE: .....

NAME : .....

TELEPHONE NUMBER : CODE: ..... NUMBER: .....

ADDRESS : .....

.....

DATE : 20...../...../.....

Please note that the Commissioner for the South African Revenue Service (SARS) will not exercise his discretionary powers in favour of any person with regard to any interest, penalties and/or additional tax leviable due to the late or underpayment of taxes, duties or levies or the rendition of returns by any person.

NAME OF PERSON RESPONSIBLE FOR CONTRACT : .....

NB: This is a pro forma application form that has to be submitted to SARS to enable them to issue the required Tax Clearance Certificate. The valid Tax Clearance Certificate furnished by the Receiver of Revenue must be submitted with the tender (to be attached to the next page).

TAX CLEARANCE CERTIFICATE

[Tax Clearance Certificate obtained from SARS to be attached here]

MBD 4

FORM A18: Declaration of Interest

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

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

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

3.1 Full Name: ……

3.2 Identity Number: ……

3.3 Company Registration Number: ……

3.4 Tax Reference Number: ……

3.5 VAT Registration Number: ……

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

3.6.1 If so, furnish particulars.

……

……

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

3.7.1 If so, furnish particulars.

……

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

3.8.1 If so, furnish particulars.

……

……

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

3.9.1 If so, furnish particulars

……

……

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

3.10.1 If so, furnish particulars.

……

……

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

3.11.1 If so, furnish particulars.

……

……

***** MSCM Regulations: "in the service of the state" means to be –

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

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

MBD 5

FORM A19: Declaration FOR Procurement above R10 Million

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

1 Are you by law required to prepare annual financial statements for auditing? ***YES / NO**

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

……

……

2 Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days? ***YES / NO**

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

2.2 If yes, provide particulars.
……
……
……
……..

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

3.1 If yes, furnish particulars
……
……

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

4.1 If yes, furnish particulars

……..……..

CERTIFICATION

I, THE UNDERSIGNED (NAME)

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

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

Signed ---------- Date ----------

Name ---------- Position ----------

Tenderer

MBD 8

FORM A20: Declaration of Bidder's Past Supply Chain Management Practices

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

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

3 The bid of any bidder may be rejected if that bidder, or any of its directors have:

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

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

5

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's database as a company or person prohibited from doing business with the public sector? **(Companies or persons who are listed on this database were informed in writing of this restriction by the National Treasury after the *audi alteram partem* rule was applied).**	Yes ☐	No ☐
4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? **(To access this Register enter the National Treasury's website, www.treasury.gov.za, click on the icon "Register for Tender Defaulters" or submit your written request for a hard copy of the Register to facsimile number (012) 3265445).**	Yes ☐	No ☐
4.2.1	If so, furnish particulars:		
4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐
4.3.1	If so, furnish particulars:		
Item	**Question**	**Yes**	**No**

4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		
4.5	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.7.1	If so, furnish particulars:		

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME) ……..…….....……..……

CERTIFY THAT THE INFORMATION FURNISHED ON THIS

DECLARATION FORM TRUE AND CORRECT.

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

……... ……..

Signature Date

……. ……..

Position Name of Bidder

MBD 9

FORM A21: Certificate of Independent Bid Determination

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

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

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

a. take all reasonable steps to prevent such abuse;

b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and

c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

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

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

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

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

MBD 9(Cont.)

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

_____

(Bid Number and Description)

in response to the invitation for the bid made by:

_____

(Name of Municipality / Municipal Entity)

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

I certify, on behalf of:_____that:

(Name of Bidder)

1. I have read and I understand the contents of this Certificate;

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

3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;

4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;

5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
   (a) has been requested to submit a bid in response to this bid invitation;

   (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and

   (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder

6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium[3] will not be construed as collusive bidding.

MBD 9(Cont.)

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

   (a) prices;
   (b) geographical area where product or service will be rendered (market allocation)
   (c) methods, factors or formulas used to calculate prices;

   (d) the intention or decision to submit or not to submit, a bid;

   (e) the submission of a bid which does not meet the specifications and conditions of the bid; or

   (f) bidding with the intention not to win the bid.

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

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

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

Signature	Date
Capacity under which Bid is Signed	Name of Bidder

FORM B1: 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

……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 .....

AS WITNESSES: 1. ……..

2. ……

Pro-forma

FORM B2: Execution Programme

The Tenderer shall attach a preliminary programme reflecting the proposed sequence and tempo of execution of the various activities comprising the work for this Contract. The programme shall be in accordance with the information supplied in the Contract, requirements of the Project Specifications and with all other aspects of the Tender.

Specific reference is made to the Clause 5.8.1 in the Contract Data for allowances of special non-working days. Allowance for inclement weather days shall base on the historical weather data supplied in PART C4: SITE INFORMATION contained in this document.

[Note: The programme must be based on the completion time as specified in the Contract Data. No other completion time that may be indicated on this programme will be regarded as an alternative offer.]

SIGNATURE:.....……DATE: …….....
(of person authorized to sign on behalf of the Tenderer)

FORM B3: Contractor's Health and Safety Declaration

In terms of Clause 4(4) of the OHSA 1993 Construction Regulations 2014 (referred to as "the Regulations" hereafter), a Contractor may only be appointed to perform construction work if the Employer is satisfied that the Contractor has the necessary competencies and resources to carry out the work safely in accordance with the Occupational Health and Safety Act No 85 of 1993 and the OHSA 1993 Construction Regulations 2014.

To that effect a person duly authorized by the tenderer must complete and sign the declaration hereafter in detail.

Declaration by Tenderer

1. I, the undersigned hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act No 85 of 1993 (as amended by the Occupational Health and Safety Amendment Act No 181 of 1993), and the OHSA 1993 Construction Regulations 2014.
2. I hereby declare that my company has the competence and the necessary resources to safely carry out the construction work under this contract in compliance with the Construction Regulations and the Employer's Health and Safety Specifications.
3. I hereby confirm that adequate provision has been made in my tendered rates and prices in the Bill of Quantities to cover the cost of all resources, actions, training and all health and safety measures envisaged in the OHSA 1993 Construction Regulations 2014, including the cost of the specific items listed in the tables hereafter.

(Tables to be completed by Tenderer)

TABLE 1: COST OF SAFETY PERSONNEL

PERSONNEL	COSTS AS ALLOWED IN TENDER	NOMINATED PERSON/S
Construction Supervisor		
Construction Safety Officer		
Health and Safety Representatives		
Health and Safety Committee		

TABLE 2: COST OF SAFETY EQUIPMENT

EQUIPMENT	STATE YES or NO	COST ALLOWED FOR IN TENDER
Hard hats		
Safety boots		
Gloves		
Dust Masks		
Safety jackets		
Add items as per risk assessment:		

4. I hereby undertake, if my tender is accepted, to provide, before commencement of the works under the contract, a suitable and sufficiently documented Health and Safety Plan in accordance with Regulation 5(1) of the Construction Regulations, which plan shall be subject to approval by the Employer.

5. I confirm that copies of my company's approved Health and Safety Plan, the Employer's Safety Specifications as well as the OHSA 1993 Construction Regulations 2014 will be provided on site and will at all times be available for inspection by the Contractor's personnel, the Employer's personnel, the Engineer and his Agents, visitors, and officials and inspectors of the Department of Labour.

6. I hereby confirm that I will be liable for any penalties that may be applied by the Employer in terms of the said Regulations (Regulation 30) for failure on the Contractor's part to comply with the provisions of the Act and the Regulations.

7. I agree that my failure to complete and execute this declaration to the satisfaction of the Employer will mean that I am unable to comply with the requirements of the OHSA 1993 Construction Regulations 2014 and accept that my tender will be prejudiced and may be rejected at the discretion of the Employer.

SIGNATURE: ..... DATE: .....
(of person authorized to sign on behalf of the Tenderer)

The Tenderer shall submit separately before commencement of the works his Health and Safety Plan as required in terms of Regulation 5 of the Occupational Health and Safety Act 1993 Construction Regulations 2014, and referred to in T2.1

FORM B4: APPLICATION FOR A PERMIT TO DO CONSTRUCTION WORK, Regulation 3(2) of Construction Regulations, 2014

[This form must be completed and forwarded, prior to commencement of work on site, by all Contractors that qualify in terms of Regulation 3 of the Construction Regulations 2014, to the office of the Provincial Director, Department of Labour]

This application must be submitted with the following documents:

1. Health and Safety specifications
2. Health and Safety Plan
3. Baseline risk assessment

1. Name, postal address and telephone numbers of client:

Name.....

Postal address .....

.....

Telephone .....

2. Details of Agent

Title, Surname and Initials .....

ID/Passport No.....

Registration no. with SACPCMP .....

Office Tel/Mobile .....

Postal address .....

.....

3. Name, postal address and telephone numbers of the appointed principal contractor:

.....

.....

4. Name, postal address and telephone numbers of designer of project:

.....

.....

5. Name, postal address and telephone numbers of the following persons:

Construction Manager .....

Construction Health and Safety Manager .....

Construction Health and Safety Officer: .....

6. Exact physical address of construction and site office:

.....

.....

7. Nature of construction work:

.....

8. Expected commencement date:

.....

9. Expected completion date:

.....

10. Estimated maximum number of people on the construction site:

.....

11. Planned number of constructors on site accountable to principal contractor:

.....

12. Name(s) of contractors appointed:

.....

.....

.....

13. Signature of Client/Client's Agent:

.....

14. Signature of Principal Contractor:

.....

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

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

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

CONTRACT

PART 1: AGREEMENT AND CONTRACT DATA

C1.1 FORM OF OFFER AND ACCEPTANCE (Agreement)

OFFER

The TENDERER is to complete and sign the Form of Offer

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

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

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

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

AMOUNT	AMOUNT IN WORDS
R……	

(firm)* (adjustable)*
*(delete which does not apply)

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

Signature(s) _____ _____

Name(s) _____ _____

Capacity _____ _____

For the Tenderer _____ _____

(Name and address of organisation)

Name and signature of witness _____ **Date** _____

Acceptance

The EMPLOYER will complete and sign the form of Acceptance

By signing this part of the 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 1 Agreement and Contract Data, (which includes this Agreement)

Part 2 Pricing Data

Part 3 Scope of Work

Part 4 Site Information

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

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

The Tenderer shall within two weeks after receiving a completed copy of this Agreement, including the Schedule of Deviations (if any), contact the employer's agent (whose details are given in the Contact Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data at, or just after, the date of 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 the Contractor) within five (5) days after 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 binding contract between the parties,

Signature(s) _____ _____

Name(s) _____ _____

Capacity _____ _____

For the Employer _____ _____

(Name and address of organisation)

Name and signature of witness _____ **Date** _____

SCHEDULE OF DEVIATIONS

Notes:

1. The extent of deviations from the tender documents issued by the employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender,
2. A Tenderer's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of offer and acceptance, the outcome of such agreement shall be recorded here,
3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here,
4. Any change or addition to the tender documents arising from the above arrangements and recorded here shall also be incorporated into the final draft of the Contract,

1 **Subject** _____

Details _____

2 **Subject** _____

Details _____

3 **Subject** _____

Details _____

4 **Subject** _____

Details _____

5 **Subject** _____

Details _____

6 **Subject** _____

Details _____

7 **Subject** _____

Details _____

8 **Subject** _____

Details _____

By the duly authorised representatives signing this Schedule of Deviations, the Employer and the Tenderer agree to and accept the foregoing Schedule of deviations as the only deviations from and amendments to the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Tenderer and the Employer during the 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 and 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(s)

_____ _____

Name(s) _____ _____

Capacity _____ _____

_____

(Name and address of organisation)

Name and signature of witness _____ **Date** _____

For the Employer:

Signature(s)

_____ _____

Name(s) _____ _____

Capacity _____ _____

_____

(Name and address of organisation)

Name and signature of witness _____ **Date** _____

C1.2 CONTRACT DATA

PART 1: DATA PROVIDED BY THE EMPLOYER

CONDITIONS OF CONTRACT

This Contract will be based on the “General Conditions of Contract for Construction Works – 3rd Edition 2015", issued by the South African Institution of Civil Engineering. (Short title: “General Conditions of Contract”) and can be obtained from:

SAICE Waterfall
Park Howick
Gardens
Vorna Valley Half way House
Becker Street
MIDRAND
1685
www.saice.org.za

Gauteng Province
Tel: (011) 805-5947/8
Fax:(011) 805-5971.

It is agreed that the only variations from the General Conditions of Contract 2015 are those set out hereafter under “Special Conditions of Contract”.

SPECIAL CONDITIONS OF CONTRACT

1. GENERAL

These Special Conditions of Contract (SCC) form an integral part of the Contract. The Special Conditions shall amplify, modify or supersede, as the case may be, the General Conditions of Contract 2015 to the extent specified below, and shall take precedence and shall govern.

The clauses of the Special Conditions hereafter are numbered “SCC” followed in each case by the number of the applicable clause or sub clause in the General Conditions of Contract 2015, and the applicable heading, or (where a new special condition that has no relation to the existing clauses is introduced) by a number that follows after the last clause number in the General Conditions, and an appropriate heading.

2. AMENDMENTS TO THE GENERAL CONDITIONS OF CONTRACT

The variations to the General Conditions of Contract are:

SCC 4.4.3 For conditions regarding selection of **LOCAL EMERGING SUB-CONTRACTORS** (LES Work), see additional clauses below.

The additional clauses to the General Conditions of Contract are:

LOCAL EMERGING SUBCONTRACTORS (LES)

The Contractor shall promptly, and in any event within a reasonable time after the Commencement Date, sub-contract a portion of the Works to the value of **thirty (30) percent** of the work specified in the Schedule of Works (excluding preliminary and general costs) ("the LES Work") to one or more of the local emerging sub-contractors notified by the Employer to the Contract ("the Local Emerging Sub-Contractors"), in strict accordance with, and subject to, the requirements set out in Paragraphs (i) to (x) of this Clause, as follows:

(i) The Contractor shall select the Local Emerging Sub-Contractor(s) to whom he is to sub-contract the LES Work by means of a competitive bidding process conducted strictly in accordance with the CIDB Standard for Uniformity in Construction Procurement and Best Practice Guidelines January 2009, and in doing so shall exercise all reasonable endeavours to ensure as inclusive and equal a distribution of the LES Work as shall be practicable amongst all the Local Emerging Sub-Contractors, taking into account price, competency and capacity only.

(ii) The Contractor shall, without reference to the Employer, consider only the competencies and capacity of each Local Emerging Sub-Contractor, be free to identify those components of the LES Work that he shall allocate to each Local Emerging Sub-Contractor.

(iii) Subject to paragraphs (iv) and (vii) of this clause, in the event that the Contractor fails to sub-contract and/or allocate the required quantum of LES Work or any portion thereof in accordance with this clause, the Engineer may either a) apply a penalty equal to 10% of the value of the shortfall, or b) make a determination regarding the setting aside of the LES Work so as to prevent the shortfall.

(iv) Subject to paragraph (vii) of this clause, and notwithstanding paragraph (iii) of this clause, in the event that the Contractor fails to sub-contract and/or allocate the required quantum of LES Work or any portion thereof in accordance with this clause by reason of his inability to reach agreement on price with one or more of the Local Emerging Sub-Contractor(s), the Engineer may, in his absolute discretion, advise the Employer to allow an increase in the Contractor's rates to so as to facilitate successful price negotiation. In the event that the Employer refuses to authorise an increase to the Contractor's rates or, in the event that the authorised increase in rates fails to facilitate successful negotiation between the Contractor and the relevant Local Emerging Sub-Contractor(s), the Contractor shall be relieved of his obligation to sub-contract the relevant portion of LES Work, always subject to paragraph (vii) of this clause.

(v) The rates to be applied by the Contractor in the sub-contracts with the Local Emerging Sub-Contractors for the LES Work shall at all times be based strictly on the rates applicable to the Contractor under the Contract, save for any adjustments allowed in terms of paragraph (iv) above.

(vi) The Contractor shall apply the same rates to each Local Emerging Sub-Contractor in respect of each component of the LES Work, such that, in the event that more than one Local Emerging Sub-Contractor is successfully selected for a single component of the LES Work, the same rates shall apply to each of the selected Local Emerging Sub-Contractors in respect of the said single component.

(vii) The Contractor shall not be under any obligation to employ a Local Emerging Sub-Contractor against whom the Contractor raises reasonable objection by written notice to the Engineer as soon as practicable, with supporting particulars in writing. In the event of failure on the part of the Contractor to prove reasonable objection to the satisfaction of the Engineer, the Engineer's determination shall be final and binding.

(viii) The Contractor shall be entitled to include within the Contract Price a maximum management fee of 10% in excess of the rates paid to the Local Emerging Sub-Contractors.

(ix) When tendering the Contractor shall have exercised all reasonable care not to distort any rates in such a way as to hinder or preclude his obligations under this clause, and, in the event that the Engineer determines the setting aside of the LES Work in terms of paragraph (iii) above, the Contractor shall be prevented from arguing that such LES Work is reserved not to be subcontracted.

(x) The Contractor shall submit a priced copy of the final agreed version of each proposed sub-contract with a Local Emerging Sub-Contractor ("the Final Draft LES Sub-Contract") to the Employer prior to the execution of such sub-contract. In the event that the Employer, in consultation with the Engineer, deems the price or any other term of any Final Draft LES Sub-Contract to be unduly onerous or unfair to the Local Emerging Sub-Contractor concerned, the Contractor shall modify the price and/or terms in accordance with the Engineer's reasonable instructions.

In sub-contracting the LES Work, the Contractor shall be responsible for performing the LES Work as if he had not sub-contracted. The Contractor shall be liable for the acts and omissions of the employees, sub-contractors and agents of the Local Emerging Sub-Contractors as if they were his own employees, sub-contractors and agents.

CONDITIONS OF CONTRACT FOR LABOUR-INTENSIVE CONSTRUCTION

Payment for the labour-intensive component of the works

Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the scope of work.

Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict.

Applicable labour laws

The Ministerial Determination, Special Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice N° R63 of 25 January 2002 shall apply to works described in the scope of work as being labour intensive and which are undertaken by unskilled or semi-skilled workers, as reproduced below.

1 Introduction

1.1 This document contains the standard terms and conditions for workers employed in elementary occupations on a Special Public Works Programme (SPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of a SPWP.
In this document –
"department" means any department of the State, implementing agent or contractor;
"employer" means any department, implementing agency or contractor that hires workers to work in elementary occupations on a SPWP;
"worker" means any person working in an elementary occupation on a SPWP; "elementary occupation" means any occupation involving unskilled or semi-skilled work; "management" means any person employed by a department or implementing agency to administer or execute an SPWP;
"task" means a fixed quantity of work;
"task-based work" means work in which a worker is paid a fixed rate for performing a task;
"task-rated worker" means a worker paid on the basis of the number of tasks completed;
"time -rated worker" means a worker paid on the basis of the length of time worked.

2 Terms of Work

2.1 Workers on a SPWP are employed on a temporary basis.

2.2 A worker may NOT be employed for longer than 24 months in any five-year cycle on a SPWP.

2.3 Employment on a SPWP does not qualify as employment as a contributor for the purposes of the Unemployment Insurance Act 30 of 1966.

3 Normal Hours of Work

3.1 An employer may not set tasks or hours of work that require a worker to work–

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

3.2 An employer and worker may agree that a worker will work four days per week.

The worker may then work up to ten hours per day.

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

4 Meal Breaks

4.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.

4.2 An employer and worker may agree on longer meal breaks.

4.3 A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.

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

5 Special Conditions for Security Guards

5.1 A security guard may work up to 55 hours per week and up to eleven hours per day.

5.2 A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

6 Daily Rest Period

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

7 Weekly Rest Period

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

8 Work on Sundays and Public Holidays

8.1 A worker may only work on a Sunday or public holiday to perform emergency or security work.

8.2 Work on Sundays is paid at the ordinary rate of pay.

8.3 A task-rated worker who works on a public holiday must be paid –

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

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

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

9 Sick Leave

9.1 Only workers who work four or more days per week have the right to claim sick pay in terms of this clause.

9.2 A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a contract.

9.3 A worker may accumulate a maximum of twelve days' sick leave in a year.

9.4 Accumulated sick-leave may not be transferred from one contract to another contract.

9.5 An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.

9.6 An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave.

9.7 An employer must pay a worker sick pay on the worker's usual payday.

9.8 Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is –

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

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

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

10 Maternity Leave

10.1 A worker may take up to four consecutive months' unpaid maternity leave.

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

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

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

10.5 A worker may begin maternity leave –

(a) four weeks before the expected date of birth; or
(b) on an earlier date –
(i) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or
(ii) if agreed to between employer and worker; or
(c) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.

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

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

11 Family responsibility leave

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

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

12 Statement of Conditions

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

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

12.2 An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.

12.3 An employer must supply each worker with a copy of these conditions of employment.

13 Keeping Records

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

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

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

14 Payment

14.1 An employer must pay all wages at least monthly in cash or by cheque or into a bank account.

14.2 A task-rated worker will only be paid for tasks that have been completed.

14.3 An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.

14.4 A time-rated worker will be paid at the end of each month.

14,5 Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.

14.6 Payment in cash or by cheque must take place –

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

14.7 An employer must give a worker the following information in writing –

(a) the period for which payment is made;
(b) the numbers of tasks completed or hours worked;
(c) the worker's earnings;
(d) any money deducted from the payment;
(e) the actual amount paid to the worker.

14.8 If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.

14.9 If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

15 Deductions

15.1 An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.

15.2 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

15.3 An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.

15.4 An employer may not require or allow a worker to –

(a) repay any payment except an overpayment previously made by the employer by mistake;
(b) state that the worker received a greater amount of money than the employer actually paid to the worker; or pay the employer or any other person for having been employed.

16 Health and Safety

16.1 Employers must take all reasonable steps to ensure that the working environment is healthy and safe.

16.2 A worker must –

(a) work in a way that does not endanger his/her health and safety or that of any other person;
(b) obey any health and safety instruction;
(c) obey all health and safety rules of the SPWP;
(d) use any personal protective equipment or clothing issued by the employer;
(e) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

17 Compensation for Injuries and Diseases

17.1 It is the responsibility of the employers (other than a contractor) to arrange for all persons employed on a SPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.

17.2 A worker must report any work-related injury or occupational disease to their employer or manager.

17.3 The employer must report the accident or disease to the Compensation Commissioner.

17.4 An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months.
The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

18 Termination

18.1 The employer may terminate the employment of a worker for good cause after following a fair procedure.

18.2 A worker will not receive severance pay on termination.

18.3 A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.

18.4 A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

18.5 A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

19 Certificate of Service

19.1 On termination of employment, a worker is entitled to a certificate stating –

(a) the worker's full name;

(b) the name and address of the employer;

(c) the SPWP on which the worker worked;

(d) the work performed by the worker;

(e) any training received by the worker as part of the SPWP;

(f) the period for which the worker worked on the SPWP;

any other information agreed on by the employer and worker.

CONTRACT SPECIFIC DATA

The following contract specific data are applicable to this contract.

Clause	Description
1.1.1.13	The "Defects Liability Period" is 12 months
1.1.1.14	The "Due Completion Date", or time for achieving Practical Completion is 18 months.
1.1.1.15	The "Employer" is the Chief Albert Luthuli Municipality.
1.1.1.16	The "Employer's Agent" is Kufanikiwa Consulting (Pty) Ltd.
1.1.1.26	The "Pricing Strategy" is re-measurement Contract.
1.2.1.2	The Employer's Agent address for receipt of communications and notices is: Telephone: (031) 701 1038 Facsimile: Address (physical): 11 Derby Downs, Westville, 3630 Address (postal): 11 Derby Downs, Westville, 3630
3.2.3	The Employer's Agent is required to obtain the specific approval of the Employer for the following functions or duties: a) Approve extension of time for practical completion in terms of Clause 5.12.1; b) Approve imposition of penalty for delay in terms of Clause 5.13.1; c) Issue of a Variation Order in terms of Clause 6.3.2; and d) Approve the use of contingency funds.
5.1.1 and 5.8.1	The special non-working days are public holidays, Saturdays, Sundays and the days on which the contractor grants the majority of his permanent workforce leave around the 15th December and the first Monday of the subsequent year.
5.3.1	The Contractor shall submit within 14 days from the Commencement Date the following documentation for approval by the Employer's Agent: a) Health and Safety Plan (Refer to Clause 4.3); b) Initial programme (Refer to Clause 5.6) and estimated cash flow; c) Security (Refer to Clause 6.2); d) Insurance (Refer to Clause 8.6); e) Proof of registration with the Workman's Compensation Commissioner; f) Valid original copy of Tax Clearance Certificate; and g) Written acceptance of appointment.
5.3.2	The time to submit the documentation required before commencement of the Works is 14 days.
5.4.1	The Site is located within inhabited areas, is generally accessible to the public and is not exclusive to the Contractor. The Contractor shall safeguard the public as statutorily required and shall coordinate assistance from the Community Liaison Officer (CLO) as nominated by the Employer.
5.8.1	The non-working days are Sundays. The special non-working days are indicated under Clause 5.1 above.

5.12	FORMULA FOR EXTENSION OF TIME IN RESPECT OF ABNORMAL RAINFALL

Extension of time in terms of Clause 5.12 of the general conditions of contract in respect of abnormal rainfall shall be determined in terms of the method below for each calendar month or part thereof, unless the project specifications determine otherwise:

$$V = (N_w - N_n) + (R_w - R_n)/20$$

Where:

- V: Extension of time in calendar days for the calendar month under consideration.
- N_w: Actual number of days during the calendar month under consideration on which a rainfall of 10mm and more is recorded.
- R_w: Actual total rainfall in mm recorded during the calendar month under consideration.
- N_n: Average number of days, derived from rainfall records, on which a rainfall of 10mm and more was recorded during the relevant calendar month as per the data tabulated hereinafter.
- R_n: Average total rainfall in mm for the relevant calendar month, derived from rainfall records, as tabulated hereinafter.

Where the extension of time due to abnormal rainfall has to be calculated for portion of a calendar month, pro rata values shall be used. Should V be negative for any particular month, and should its absolute value exceed the corresponding value of N_n, then V shall be taken as being equal to minus N_n. The total extension of time to be granted shall be the algebraic sum of all the monthly extensions, provided that if this total is negative then the time for completion shall not be reduced due to subnormal rainfall.

The Contractor shall, at its own cost, provide and erect on the Site at a location approved of by the Employer's Agent, an approved rain gauge, which shall be fenced off in a manner which will prevent any undue interference by workmen and others. The Contractor shall, at its own cost, arrange for the reading of the rain gauge on a daily basis for the duration of the Contract. The gauge readings, as well as the date and time at which the reading was taken shall be recorded in a separate record book provided by the Contractor for this purpose. All entries in the rainfall record books shall be signed by the person taking the reading and the gauge shall be properly emptied immediately after each reading has been taken. If required, the Employer's Agent shall be entitled to witness the reading of the gauge.

The rainfall records applicable to this Contract are those recorded at Carolina. The following values of N_n and R_n shall apply:

	<table><tr><th>MONTH</th><th>N_n (Days)</th><th>R_n (mm)</th></tr><tr><td>January</td><td>14.2</td><td>125.6</td></tr><tr><td>February</td><td>11.0</td><td>79.8</td></tr><tr><td>March</td><td>13.0</td><td>77.2</td></tr><tr><td>April</td><td>7.6</td><td>43.7</td></tr><tr><td>May</td><td>2.8</td><td>14.2</td></tr><tr><td>June</td><td>0.6</td><td>1.0</td></tr><tr><td>July</td><td>1.7</td><td>3.3</td></tr><tr><td>August</td><td>3.8</td><td>5.1</td></tr><tr><td>September</td><td>5.3</td><td>32.8</td></tr><tr><td>October</td><td>14.2</td><td>96.2</td></tr><tr><td>November</td><td>16</td><td>106.2</td></tr><tr><td>December</td><td>16.5</td><td>159.8</td></tr><tr><td>Total</td><td>106.7</td><td>744.9</td></tr></table>
5.13.1	The penalty for failing to complete the Works is 0.08% of the contract amount per day, to a maximum of 5% of the contract amount.
5.14.1	The requirements for achieving Practical Completion are set out in the Scope of Works Part C3.1.2.1.
5.14.7	This contract does not contain multiple “Due Completion Dates”.
5.16.3	The latent defects liability period for civil engineering works is 10 years.
6.2.1	The type of security for the due performance of the Contract shall be a Fixed Performance Guarantee of 10% of the value of the Works (Excl. Contingencies and VAT). The Performance Guarantee shall follow the suggested wording according to the pro-forma included in Section C1.3 – Performance Guarantee.
6.5.1.2.3	The percentage allowance on the net cost of workmen and materials actually used in the completed work is 15%.
6.8.2	The Contract Price Adjustment Factor shall not be applied to this Contract. • The value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule with the following values: o The value of x = 0.10 o The values of the coefficients are (and the sum thereof is unity): ▪ a = 0.15 Labour ▪ b = 0.20 Contractor’s equipment ▪ c = 0.55 Material ▪ d = 0.10 Fuel

	○ The indices as follows are published by Statistics South Africa and shall be agreed on at commencement: ▪ "L" is the "Labour Index"; ▪ "P" is the "Contractor's Equipment Index"; ▪ "M" is the "Materials Index"; and ▪ "F" is the "Fuel Index". ○ The base month is "June": "the month prior to the closing of the Tender". ○ The applicable month for the statement is denoted by "t".
6.8.3	Price adjustment in the cost of special materials shall be applied to this Contract.
6.10.1.5	The percentage advance on materials not yet built into the Permanent Works is 80%. The percentage advance on Plant not yet supplied to Site 80% (if plant is fabricated or stored on other places than the Site).
6.10.3	The limit on retention is 10% of the Contract Price
8.6.1	The following insurances shall be effected and maintained in the joint names of the Employer and Contractor:
8.6.1.1	Insurance of the Works, Plant and materials for the period of Care of the Works for a sum insured that is the aggregate of:
8.6.1.1.1	The Contract Price (Excl. Contingencies and VAT);
8.6.1.1.2	The value of Plant and materials supplied by the Employer to be included in the insurance is R 0.00 (Excl. VAT); and
8.6.1.1.3	The amount to cover professional fees payable in respect of the repair or reinstatement of damage to the works or said movables is R 0.00 (Excl. VAT).
8.6.1.2	The Contractor is responsible for Special Risks Insurance.
8.6.1.3	Liability insurance of at least R 5 000 000.00 with the number of events being unlimited.
8.6.5	The insurances shall be effected with an insurance company registered in South Africa.
10.5.2	Dispute resolution shall be by ad-hoc adjudication.
10.5.3	The number of Adjudication Board Members to be appointed is one or three.
10.7.1	In the event of disagreement with the Adjudication Board's decision the determination of disputes shall be by arbitration.
10.8.1	In the event of disagreement with the Arbitrator the determination of disputes shall be by court proceedings.

C1.2.2: PART 2: DATA PROVIDED BY THE CONTRACTOR

GENERAL

Clause	Description
1.1.1.9	**Name of the Contractor:**

……..

1.2.1.2 **Address of the Contractor:**

Physical:	Postal:
.....	.....
.....	.....
.....	.....
.....	.....

E-Mail: .....

Telephone No: ……..... Fax No: ……

6.2.1

Type Of Security	**Contractor's Choice. Indicate "Yes" or "No"**
Cash Deposit of 10% of the Contract Sum.	
Fixed Performance Guarantee of 10% of the Contract Sum.	
Variable Performance Guarantee of ….% of the Contract Sum for the first period and …% of the Contract Sum for the second period.	
Retention of 10% of the value of the Works.	
Cash Deposit of 10% of the Contract Sum plus retention of 10% of the value of the Works.	
Fixed Performance Guarantee of 10% of the Contract Sum plus retention of 10% of the value of the Works.	
Variable Performance Guarantee of ….% of the Contract Sum for the first period and …% of the Contract Sum for the second period plus retention of …% of the value of the Works.	

C1.2 CONTRACT DATA

6.8.3 Variation in cost of special materials

The variation in cost of special materials is:

Type of special material	Unit	Base Rate or price

* Indicate whether the material shall be delivered in bulk or in containers. When called upon to do so, the Contractor shall substantiate the above rates or prices with acceptable documentary evidence.

Signed on behalf of Tenderer:

…….

Clause 4.4.3: **Selection of Sub-Contractors**

The Tenderer shall list on FORM A10 the Subcontractors and Suppliers whom he intends to appoint in respect of the various specialist items of work to be done or goods supplied on this contract. Alternatives may be mentioned.

The Tenderer shall state whether he intends to carry out any specialised work or supply of goods himself.

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

The sub-contractors listed exclude the identified local emerging contractors who will be identified by the Employer.

Signed on behalf of Tenderer:

……..

C1.3 FORMS OF SECURITIES

FORMS FOR COMPLETION BY THE CONTRACTOR

THE FOLLOWING FORMS ARE TO BE COMPLETED BY THE CONTRACTOR AFTER THE TENDER HAS BEEN AWARDED TO THE SUCCESSFUL TENDERER

Form		**Page**
C1.3.1	Form of Guarantee	F.2
C1.3.2	Agreement with Adjudicator	F.6
C1.3.3	Agreement in terms of the Occupational Health and Safety Act	F.8
C1.3.4	Blasting Indemnity	F.10

The forms will be completed by the Contractor who will be instructed to do so in the Form of Acceptance. The completed forms will become part of the Contract.

The Form of Guarantee is a pro forma document. An original document, from a financial institution, with the same text will be provided by the Contractor within the time stated in the Contract Data. Only a Bank or approved Insurance Company or Guarantee Corporation is acceptable as Guarantor.

Pro Forma Performance Guarantee

GUARANTOR DETAILS AND DEFINITIONS

"**Guarantor**" means: _____

_____

Physical address: _____

_____

"**Employer**" means: **Chief Albert Luthuli Municipality**

"**Contractor**" means: _____

"**Employer's Agent**" means: A Professional Registered with the Engineering Council of South Africa (ECSA) is Mrs S. Mngadi (Pr. Tech. Eng.) & Mr M. Mlotshwa (Pr. Techni. Eng.).

"**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 inclusive of tax of R_____

_____

Amount in words: _____

_____

"**Guaranteed Sum**" means: The maximum aggregate amount of R_____

_____

Amount in words: _____

_____

Type of Performance Guarantee: _____ *(Insert Variable or Fixed)*

"**Expiry Date**" means: _____ *(Give date)* or any other later date set by the Contractor and/or Employer provided such instruction is received prior to the Expiry Date as indicated here.

CONTRACT DETAILS

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

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 interim 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 interim payment certificate up to and including the Expiry Date, or the date of issue by the Employer's Agent of the Certificate of Completion of the Works, 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 on which the Performance Guarantee is signed, up to and including the Expiry Date, or the date of issue by the Employer's Agent of the Certificate of Completion of the Works, or the date of payment in full of the Guaranteed Sum, whichever occurs first.

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 of the Works 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;

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 consider 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 Magistrates' Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at: _____

Date: _____

Guarantor's signatory (1):_____

Capacity: _____

Guarantor's signatory (2):_____

Capacity: _____

Witness signatory (1) _____

Witness signatory (1) _____

C1.3.2: AGREEMENT WITH ADJUDICATOR

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

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

of (*address)*.....

.....and the Contractor

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

of *(address)*.....

.....
(hereinafter called **the Parties**)

and

(name).....

of *(address)* .....

.....
(hereinafter called **the Adjudicator**)

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

and known as Contract No.....

(Contract title).....

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

IT IS NOW AGREED as follows:

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

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

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

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

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

SIGNED by:

(*Signature*)*:*	(*Signature*)*:*	(*Signature*)*:* .....
Name:	**Name**:	**Name**: .....
who warrants that he/ she is authorised to sign for and **Party** in the presence of	who warrants that he/ she is duly authorised to sign for and on behalf of the S**econd Party** in the presence of	the **Adjudicator** in the duly presence of on behalf of the **First**
Witness: (*Signature*).....	**Witness:** (*Signature*).....	**Witness:** (*Signature*).....
Name:	**Name**:	**Name**:.....
Address:	Address:	Address: .....
.....	.....	.....
.....	.....	.....
Date:	Date:	Date: .....

C1.3.3: AGREEMENT IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT No 85 OF 1993

THIS AGREEMENT is made between **Chief Albert Luthuli Municipality**

(hereinafter called the **EMPLOYER** of the one part, herein represented by:

....

in his capacity as: .....;

AND: ....

(hereinafter called the **CONTRACTOR**) of the other part, herein represented by .....

....

in his capacity as: .....

duly authorised to sign on behalf of the Contractor.

WHEREAS the CONTRACTOR is the Mandatory of the EMPLOYER in consequence of an agreement between the CONTRACTOR and the EMPLOYER in respect of

BID No:……

……..……

AND WHEREAS the **EMPLOYER and the CONTRACTOR have agreed to enter into an agreement in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act No 85 of 1993, as amended by OHSA Amendment Act No 181/1993 (hereinafter referred to as the ACT);**

NOW THEREFORE the parties agree as follows:

1. **The CONTRACTOR undertakes to acquaint the appropriate officials and employees of the CONTRACTOR with all relevant provisions of the ACT and the regulations promulgated in terms thereof.**

2. The CONTRACTOR undertakes to fully comply with all relevant duties, obligations and prohibitions imposed in terms of the ACT and Regulations: Provided that should the EMPLOYER have prescribed certain arrangements and procedures that same shall be observed and adhered to by the CONTRACTOR, his officials and employees. The CONTRACTOR shall bear the onus of acquainting himself/herself/itself with such arrangements and procedures.

3. The CONTRACTOR hereby accepts sole liability for such due compliance with the relevant duties, obligations, prohibitions, arrangements and procedures, if any, imposed by the ACT and Regulations, and the CONTRACTOR expressly absolves the EMPLOYER and the Employer's CONSULTING ENGINEERS from being obliged to comply with any of the aforesaid duties, obligations, prohibitions, arrangements and procedures in respect of the work included in the contract.

4. The CONTRACTOR agrees that any duly authorised officials of the EMPLOYER shall be entitled, although not obliged, to take such steps as may be necessary to ensure that the CONTRACTOR has complied with his undertakings as more fully set out in paragraphs 1 and 2 above, which steps may include, but shall not be limited to, the right to inspect any appropriate site or premises occupied by the CONTRACTOR, or to take such steps it may deem necessary to remedy the default of the CONTRACTOR at the cost of the CONTRACTOR.

5. 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 in terms of this agreement, and shall, on written demand, provide full details in writing of such investigation, complaint or criminal charge.

Thus signed at ...……...……...……...for and on behalf of the **CONTRACTOR**

on this the ……. day of ……...…… 20……

SIGNATURE: .....

NAME AND SURNAME: .....

CAPACITY: .....

WITNESSES: 1. .....

2. .....

Thus signed at ……. for and on behalf of the **EMPLOYER** on

the ……... day of ……..…… 20……

SIGNATURE: .....

NAME AND SURNAME: .....

CAPACITY: .....

WITNESSES: 1. .....

2. .....

C.1.3.4 BLASTING INDEMNITY

Contract No. _____ Given by _____

*Company Registration No. _____

Address _____

a *Company incorporated with limited liability according to the company laws of the Republic of South Africa, *Partnership, *Close Corporation, *Public Company (hereinafter called the Contractor),

represented herein by _____ in his capacity as the Contractor's _____ duly authorised hereto by a resolution of the Contractor dated _____ a certified copy of which resolution is attached to this Indemnity.

WHEREAS the Contractor has entered into a Contract with the Chief Albert Luthuli Municipality (hereinafter called the Company) for,

_____

and the Company requires this Indemnity from the Contractor

NOW THEREFORE THIS DEED WITNESSETH that the Contractor does hereby indemnify and hold harmless the Company in respect of all loss or damage that may be incurred or sustained by the Company by reason of or in any way arising out of or caused by blasting operations that may be carried out by the Contractor in connection with the aforementioned Contract and also in respect of all claims that may be made against the Company in consequence of such blasting operations, by reason of or in any way arising out of any accidents or damage to persons, life or properly or any other cause whatsoever, and also in respect of all legal or other expenses that may be incurred by the Company in examining, resisting or settling any such claims; for the due performance of which the Contractor binds itself according to law.

THUS DONE AND SIGNED for and on behalf of the Contractor at _____ on the _____ day of_____ 20____ in the presence of the subscribing witnesses.

AS WITNESSES

1. _____ _____

SIGNATURE

2. _____ _____

DESIGNATION OF SIGNATORY

***Delete which does not apply**

PART C2: PRICING DATA

PRICING INSTRUCTIONS 1
BILL OF QUANTITIES 4

PRICING INSTRUCTIONS

Measurement and payment shall be in accordance with the Standardised Specifications for Civil Engineering Construction referred to in the Scope of Works, subject to the variations and amendments contained in the Section C3.5 Project Specifications.

Descriptions in the Bill of Quantities are abbreviated and comply generally with those in the Standardised Specifications. Standardised Specification, read together with the relevant clauses of Part C3: Scope of Work, set out what ancillary or associated activities are included in the rates for the operations specified.

Should any requirements of the measurement and payment clause of the applicable Standardised Specification, or the Scope of Work, conflict with the terms of the Bill of Quantities, the Employer's Agent shall direct the applicable requirements.

The clauses in a specification in which further information regarding the listed items in the Bill of Quantities can be obtained appear under "Payment Reference" column.

The reference clauses indicated are not necessarily the only sources of information in respect of billed items. Further information and set specifications may be found in Section C3.5 Project Specifications. Standardised Specifications refers the COLTO Standard Specifications for Road and Bridge Works for State Road Authorities (1998 Edition) shall apply for the construction of the Works.

Unless otherwise stated, items are measured nett in accordance with the drawing sand no allowance is made for waste. The quantities set out in the Bill of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due only.

The prices and rates to be inserted in the Bill of Quantities are to be the full inclusive prices for the work described under the various items. The prices and rates shall cover all costs and expenses that may be required in and for the execution of the work described, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based, as well as overhead charges and profit. The prices will be used as a basis for assessment of payment for additional work that may have to be carried out.

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

Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered such items.

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 be covered by the other prices or rates in the Bill of Quantities and recorded as zero. A single lump sum will apply should a number of items be grouped together for pricing purposes.

Except where rates only are required, the Tenderer shall insert all amounts to be included in his total tendered price in the “Amount” column and show the corresponding total tendered price.

The units of measurement described in the Bill of Quantities are metric units. Abbreviations used in the Bill of Quantities are as follows:

Ha	=	hectare
h	=	hour
kl	=	kilolitre
kg	=	kilogram
km	=	kilometre
kW	=	kilowatt
km-pass	=	kilometre pass
MN	=	Mega Newton
kPa	=	kilopascal
MN.m	=	Mega Newton-metre
l	=	litre
%	=	percentage
m	=	metre
PC Sum	=	Prime Cost Sum
mm	=	millimetre
P Sum	=	Provisional Sum
PS/m	=	Provisional Sum per month
PS/d	=	Provisional Sum per day
Sum/wd	=	Sum per working day
m^2	=	square metre
No.	=	number
m2.pass	=	square metre-pass
R/Only	=	Rate Only
m^3	=	cubic metre
Sum	=	lump sum
m^3.km	=	cubic metre-kilometre
t	=	ton (1 000 kg)
MPa	=	Mega Pascal
W/day	=	Work day
%	=	percentage
mth	=	month

The parts of the contract to be constructed using labour-intensive methods have been marked in the Bill of Quantities with the letters LI in a separate column filled in against every item so designated.

The works, or parts of the works so designated, are to be constructed using labour-intensive methods only. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letters LI are not necessarily an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any of the requirements in the generic labour-intensive specification.

Payment for items which are designated to be constructed labour-intensively will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment.

BILL OF QUANTITIES

C2.2 Bill of Quantities

ITEM	PAYMENT CLAUSE	(LI)	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1	**SABS 1200 A**		**SECTION 1: PRELIMINARY AND GENERAL** **NOTE: A rate or price must be entered in the amount column for each item. No item's cost may be "included" in the price of any other item's cost and the price tendered for any item for which a price is not tendered will be held to be zero.**				
1,1	**PSA 8.2.1**		**FIXED-CHARGE ITEM**				
1.1.1	PSA 8.3.1		Contractor's Contractual Requirement	Sum	1		
	8.3.2 **PSA 8.3.2.1**		***Establishment Facilities on the site*** ***Facilities for Engineer (SABS 1200 AB)***				
1.1.2			a) Furnished Air Conditioned Engineers Office made Covid 19 Safe	No	1		
1.1.3			b) Name board	No	1		
1.1.4			c) Photostatic Facilities to be print A3	No	1		
1.1.5			c) Boardroom to be made Covid-19 safe (15 people)	No	1		
1.1.6			d) Parking Bays	No	2		
1.1.7			e) Ablution Facilities	No	1		
	PSA 8.3.2.2		***Facilities for Contractor***				
1.1.8			a) Offices, storage sheds, fencing etc	Sum	1		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
1.1.9			b) Workshop	Sum	1		
1.1.10			c) Change Rooms, Male and Female with Sanitisers	Sum	1		
1.1.11			c) Eating Area, Ventilated and Ensuring Social Distancing with Sanitisers	Sum	1		
1.1.12			e) Ablution and latrine facilities with sanitisers	Sum	1		
1.1.13			f) Tools and equipment	Sum	1		
1.1.14			g) Water supplies, electric power and communication	Sum	1		
1.1.15			h) Dealing with water	Sum	1		
1.1.16			i) Access	Sum	1		
1.1.17			j) Plant	Sum	1		
1.1.18			k) Laydown & pipe rack facilities	Sum	1		
1.1.19	8.3.3		j) Other fixed-charge obligations	Sum	1		
1.1.20			Adherence to safety regulations & protective clothing for local labour, based upon a 3 monthly rotation period. Supply of Safety Apparel (Safety Boots, Reflector Vests, Orange Overalls bearing the EPWP Logo and large EPWP on the back and safety gloves for all targeted labour	Sum	1		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
1.1.21	PE		Preparation of risk assessments, safe work procedures, the project H&S File, the H&S plan, the provision of PPE and protective clothing, and other H&S matters that the contractor deems necessary	Sum	1		
1.1.22	8.3.3		All work required to be done for environmental management as per the EMPr. NB. Exclude topsoil; compaction of earth berms and grassing etc. as these are individually itemised.	Sum	1		
	PE		**Completion and checking the Project H&S File and handing over to the Client on completion of the Works**				
1.1.23	8.3.4		Removal of site establishment on completion	Sum	1		
1,2	**PSA 8.2.2**		**TIME RELATED ITEMS**				
1.2.1	8.4.1		Contractual requirements	Sum	1		
	8.4.2		**Operate and maintain facilities on the site for the duration of construction:**				
	PSA 8.4.2.1		**Facilities for Employer's Agent**				
1.2.2			a) Maintaining air-conditioned office	Month	18		
1.2.3			b) Maintaining print facilities	Month	18		
1.2.4			c) Accommodation for the Employer's Agent	Prov. Sum	1		
1.2.5			d) Parking Bays	Month	18		
1.2.6			e) Ablution Facilities	Month	18		
1.2.7			f) Cell phone and Internet Connectivity	Month	18		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
		PSA 8.4.2.2	**Facilities for Contractor for duration of construction, except where otherwise stated**				
1.2.8			a) Offices, storage sheds, fencing etc	Month	18		
1.2.9			b) Workshop	Month	18		
1.2.10			c) Laboratories	Month	18		
1.2.11			e) Ablution and latrine facilities	Month	18		
1.2.12			f) Tools and equipment	Month	18		
1.2.13			g) Water supplies, electric power and communication	Month	18		
1.2.14			h) Dealing with water	Month	18		
1.2.15			i) Access	Month	18		
1.2.16			j) Plant	Month	18		
1.2.17			k) Laydown & pipe rack facilities	Month	18		
1.2.18	PSA 8.3.5		Cost of Survey in Terms of the Land Survey Act	Sum	1		
1.2.19	PSA 8.3.6		Public Notices and Warnings to Consumers	Sum	1		
1.2.20			Supervision for the duration of construction	Month	18		
1.2.21	8.4.4		Company and head office overhead costs for the duration of the contract	Month	18		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
1.2.22			Updating and amending the risk assessments, safe work procedures, the project H&S file, the H&S plan, the provision of PPE and protective clothing and any other H&S matters that the contractor deems necessary	Month	18		
1.2.23			Full compliance with all H&S matters during construction of the works under the contract	Month	18		
1.2.24			All work required to be done for Environmental management as per the EMPr. NB Excluding topsoil; compaction of earth berms and grassing etc. as these are individually itemised	Month	18		
1.2.25	8.4.5		Other time-related obligations	Sum	1		-
1,3	**PSA 8.5**		**SUMS STATED PROVISIONALLY BY ENGINEER**				
1.3.1			(a) Provide indemnity for unused materials on site (bond cost)	Prov. Sum	1	R150 000,00	R150 000,00
1.3.2			*(i) Overheads and profits on item 1.3.1*	%			
1.3.3			(b) One filling of reservoir	Prov. Sum	2	R50 000,00	R100 000,00
1.3.4			*(i) Overheads and profits on item 1.3.3*	%			
1.3.5			(c) Water for testing pipelines (2 fillings per test length)	Prov. Sum	1	R250 000,00	R250 000,00
1.3.6			*(i) Overheads and profits on item 1.3.5*	%			
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
1.3.7		LI	(d) Relocation of existing services and fences where ordered	Prov. Sum	1	R100 000,00	R100 000,00
1.3.8			*(i) Overheads and profits on item 1.3.7*	%			
1.3.9			(e) Inspection of materials by inspectors appointed by the Engineer	Prov. Sum	1	R250 000,00	R250 000,00
1.3.10			*(i) Overheads and profits on item 1.3.9*	%			
1.3.11			(f) Provisional sum for Community Liaison Officer	Prov. Sum	1	R450 000,00	R450 000,00
1.3.12			*(i) Overheads and profits on item 1.3.11*	%			
1.3.13			(g) Allowance for 2No students for in-service training	Prov. Sum	1	R270 000,00	R270 000,00
1.3.14			*(i) Overheads and profits on item 1.3.13*	%			
1.3.15			(h) Allowance for Environmental Control Officer (ECO) to inspect, monitor, assess construction site and prepare monthly site audit reports to the client and to be appointed under the Engineer	Prov. Sum	1	R500 000,00	R500 000,00
1.3.16			(i) Overheads and profits on item 1.3.15	%			
1.3.17			(i) Allowance for SHE Officer to inspect, monitor, assess construction site and prepare monthly site audit reports to the client and to be appointed under the Engineer	Prov. Sum	1	R500 000,00	R500 000,00
1.3.18			(i) Overheads and profits on item 1.3.16	%			
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
1.3.19			(j) Provision of basic survey reference by a nominated surveyor as ordered by engineer	Prov. Sum	1	R150 000,00	R150 000,00
1.3.20			(i) Overheads and profits on item 1.3.19	%			
1.3.21			(k) Additional testing where instructed by engineer	Prov. Sum	1	R500 000,00	R500 000,00
1.3.22			(i) Overheads and profits on item 1.3.21	%			
1.3.23		LI	(l) Proving of existing underground services as instructed by the Engineer	Prov. Sum	1	R150 000,00	R150 000,00
1.3.24			(i) Overheads and profits on item 1.3.23	%			
1.3.25			(m) Safety and Security when instructed by the Engineer	Prov. Sum	1	R200 000,00	R200 000,00
1.3.26			(i) Overheads and profits on item 1.3.25	%			
1.3.27			(n) Provisional Sum for repair to unknown services by local authority/ service provider	Prov. Sum	1	R80 000,00	R80 000,00
1.3.28			(i) Overheads and profits on item 1.3.27	%			
1.3.29			(o) Provisional Sum for relocation of services by local authority/service provider as Directed by the Engineer	Prov. Sum	1	R50 000,00	R50 000,00
1.3.30			(i) Overheads and profits on item 1.3.29	%			
1.3.31			(p) Provisional Sum for preparing and proving of pipe joint integrity	Prov. Sum	1	R150 000,00	R150 000,00
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
1.3.32			(i) Overheads and profits on item 1.3.31	%			
1.3.35			(q) Provisional Sum for the supply and installation of approved locks/ keys	Prov. Sum	1	R5 000,00	R5 000,00
1.3.36			(i) Overheads and profits on item 1.3.35	%			
1.3.37			(r) Provisional Sum for the supply and installation of approved safety equipment and signage	Prov. Sum	1	R15 000,00	R15 000,00
1.3.38			(i) Overheads and profits on item 1.3.38	%			
1.3.39			(s) Allowance for lightning protection	Prov. Sum	1	R100 000,00	R100 000,00
1.3.40			(i) Overheads and profits on item 1.3.39	%			
1.3.41			(t) Allowance for telemetry	Prov. Sum	1	R500 000,00	R500 000,00
1.3.42			(i) Overheads and profits on item 1.3.41	%			
1.3.43			(u) Provisional Sum for procuring an ISD Consultant	Prov. Sum	1	R500 000,00	R500 000,00
1.3.44			(i) Overheads and profits on item 1.3.43	%			
1.3.45			(v) Provisional Sum for paying Project Steering Committee members for monthly attending meetings	Prov. Sum	1	R500 000,00	R500 000,00
1.3.46			(i) Percentage charges and profit on item 1.3.45	%			
1,4	**PSA 8.7**		**DAYWORKS**				
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
1.4.1			a) Labour	Prov. Sum	1	R250 000,00	R250 000,00
1.4.2			Percentage adjustment to above to cover overheads, charges and profits	%			
1.4.3			b) Materials	Prov. Sum	1	R150 000,00	R150 000,00
1.4.4			Percentage adjustment to above to cover overheads, charges and profits	%			
1.4.5			c) Plant	Prov. Sum	1	R350 000,00	R350 000,00
			Note 1: Standing time on plant will be paid at 2/3 of the rate agreed for use of plant on Dayworks **Note 2: Reimbursement of the use of tools, small plant, equipment, consumable materials and non-working supervisory staff including their transport must be included in their percentage adjustment.**				
1.4.6			Percentage adjustment to 1.4.5 to cover overheads, charges and profits	%			
1,5	**PSA 8.6**		**TRAINING** **Provisional Sum for the provision of Technical Support by the Engineer on Site/Construction monitoring to assist the Contractor**				
			a) Generic Skills				
1.5.1			(i) Training Costs/Support Cost	Prov. Sum	1	R150 000,00	R150 000,00
1.5.2			(ii) Handling cost and profit in respect of sub-item	%			
1.5.3			Transport and accommodation of workers for training where it is not possible to undertake the training in close proximity to the site.(Provisional sum)	Prov. Sum	1		
TOTAL CARRIED TO SUMMARY							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
1,6	**PS 8.9**		**TEMPORARY WORKS**				
1.6.1			Safety measurements for excavated trenches and dealing with traffic (complete incl. road signs and flagmen)	Sum	1		
1.6.2			Provision of construction access along pipe routes	Sum	1		
1.6.3			Maintain access to the works for the duration of contract	Sum	1		
1.6.4			Provision of Construction Record Information (As-Built)	Sum	1		
TOTAL CARRIED TO SUMMARY							

ITEM	PAYMENT CLAUSE	(LI)	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
2	**SANS 1200C**		**SECTION 2 :SITE CLEARANCE**				
2,1			**Water Pipelines**				
2.1.1	8.2.1	LI	a) Clear & grub (4m wide strip)	m	4 940		
2.1.2			Extra over item 2.1.1 for 10m working strip restriction	m	500		
	8.2.2		b) Remove and grub large trees and tree stumps				
2.1.3			(i) Girth greater than 1m but less than 2m	No	48		
2.1.4			(ii) Girth greater than 2m but less than 3m	No	12		
2,2	**SANS 1200DA 8.3.2**		**EARTHWORKS (SMALL WORKS) RESTRICTED EXCAVATION**				
2.2.1		LI	Remove topsoil to nominal depth of 150mm stockpile, maintain and reinstate (strip width 4m)	m²	970		
2.2.2		LI	Excavate by hand for proving of existing services	m³	280		
2.2.3		LI	Preparation for planting and grassing across full working width	m²	25 700		
2.2.4		LI	Fertilizing with approved fertilizer (B: 3: 2 @ 300kg/hectare)	kg	775		
2.2.5		LI	Planting of Cynodon Dactylon by hand seeding at 25kg/ha	ha	65		
2.2.6		LI	Planting of Intercrop cover if required by hand seeding - Eragrotis Tef at 5kg/ha	Ha	15		
			-				
TOTAL CARRIED TO SUMMARY							

ITEM	PAYMENT CLAUSE	(LI)	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3	**SABS 1200 DB**		**SECTION 3: EARTHWORKS (PIPE TRENCHES)**				
3,1	**8.3.2**		**Excavation** **NB: All excavations to be carried out using Labour Based Construction Methods unless otherwise agreed with the Engineer**				
			a) Excavate in all materials for trenches, backfill, compact and dispose of surplus material for pipes: 355mm Ø for trench depth:				
3.1.1		LI	i) Exceeding 0.0m but not exceeding 1.0m	m	10		
3.1.2		LI	ii) Exceeding 1.0m but not exceeding 2.0m	m	2 215		
3.1.3		LI	iii) Exceeding 2.0m but not exceeding 3.0m	m	2 320		
	PSDB 8.3.2		**b) Extra Over Items 3.1.1 to 3.1.3**				
3.1.4			i) Intermediate excavation	m³	500		
3.1.5			ii) Hard rock excavation	m³	500		
3.1.6			iii) Boulder excavation Class A	m³	500		
3.1.7			iv) Boulder excavation Class B	m³	500		
3.1.8		LI	c) Excavate and dispose of unsuitable material to spoil from trench bottom (Provisional)	m³	3 610		
3.1.9			Compaction at road crossings to DOT specifications	m³	290		
3.1.10	**8.3.3.1**		**Make up deficiency in backfill material**				
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
3.1.11			a) From other necessary excavation on site	m³	3 610		
3.1.12			b) Imported backfill material from designated borrow pit within the project area	m³	2 710		
3.1.13			c) Imported backfill material from commercial sources	m³	3 610		
3.1.14	8.3.3.3		Compaction under roadways	m³	200		
3,2	**PSDB 8.3.4**		**Particular Items**				
3.2.1		LI	c) Supply and install sack breakers in trenches	No	2 470		
3.2.2			d) Build cross embarkments as specified where ordered	m³	290		
3,3	**8.3.5**		**Existing services that intersect/adjoin a trench**				
			a) Services that Intersect a Trench				
3.3.1		LI	i) Stormwater pipes up to 600mm diameter	No	8		
3.3.2		LI	iii) Electric cables	No	4		
3.3.3		LI	iv) Tele-communication cables	No	2		
			b) Services that adjoin a trench				
3.3.4		LI	i) Stormwater pipes up to 600mm diameter	m	80		
3.3.5		LI	ii) Water pipes up to 250mm diameter	m	2 300		
3.3.6		LI	iii) Electric cables	m	200		
3.3.7		LI	iv) Tele-communication cables	m	30		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
3,4	**SABS 1200 DK 8.2.1**		**Gabions and Pitching** **Surface preparation for bedding of Gabions**				
3.4.1		LI	a) Surface preparation - cavities filled with excavated material	m²	1 427		
3,5	**PSDK 8.2.2**		**Gabions:**				
3.5.1		LI	a) 2m x 1m x 1m boxes, constructed of PVC coated 2.7m galvanised wire mesh, size 80mm x 100mm, diaphragm spacing 1m, selvedge 3.4m, including rock fill	m³	720		
3.5.2		LI	b) 2m x 3m x 0.23m boxes, constructed of PVC coated 2.7m galvanised wire mesh, size 80 x 100mm, diaphragm spacing 1m, selvedge 3.4m, including rock fill	m³	720		
3.5.3	8.2.4	LI	Grade 4 Geotextile	m²	1 430		
3.5.4	8.2.5	LI	Stone pitching	m²	1 430		
3,6			**Excavation across gravel roads** **Selective excavation in all materials for trenches, backfill with stabilized 5% cement, compact and dispose of surplus material for trenches under gravel roads for pipes up to 600mm diameter (only one half of the road is to be opened at any one time)**				
3.6.1							
3.6.2			0.0m - 3.0m	m	75		
3.6.3			Reinstate road surfaces complete for gravel surface roads	m²	560		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
3,7			**Excavation across surfaced roads**				
3.7.1			**Selective excavation in all materials for trenches, backfill with stabilized 5% cement, compact and dispose of surplus material for trenches under gravel roads for pipes up to 600mm diameter (only one half of the road is to be opened at any one time)**				
3.7.2			0.0m - 3.0m	m	72		
3.7.3		LI	Saw-cut through existing surfaced road	m	72		
3.7.4		LI	Reinstate road surfaces complete for surfaced surface roads and asphalt 50mm thick on roadway	m^3	10		
3,8	**SABS 1200 D**		**Surface finishes to trenches**				
3.8.1	PSD 8.3.10	LI	Reinstate top 75mm of trench with topsoil from stockpile and compact	m^3	750		
3.8.2	PSD 8.3.11	LI	a) Supply and place grass sods including fertilisers at a spread rate of 20kg per 1000m^2 where ordered	m^2	9 880		
3.8.3		LI	b) Supply and lay geofabric soil savers as specified where ordered	m^2	9 880		
3.10	**SABS 1200 LB**		**PROVISION OF BEDDING**				
	8.2.1		Selected from trenches, and/or other excavation without the need for screening or other treatment:				
3.10.1		LI	a) Selected granular material	m^3	905		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
3.10.2	8.2.2.2	LI	b) Selected fill material Selected from designated borrow pit, including all costs for additional handling and transport (borrow pit located within 5km radius of pipeline)	m³	2 705		
3.10.3		LI	a) Selected granular material	m³	905		
3.10.4	PSLB 8.2.2.3	LI	b) Selected fill material Supply bedding from commercial sources, where ordered:	m³	2 705		
3.10.5		LI	a) Selected granular material	m³	905		
3.10.6		LI	b) Selected fill material	m³	2 705		
3.10.7	PSLB 8.2.3	LI	Concrete bedding cradle	m³	780		
3.10.8	PSLB 8.2.4	LI	Concrete encasing of pipes in trenches in 20/19 concrete	m³	25		
3.10.9			**SUB SOIL DRAINS** **Natural permeable material in subsoil drainage systems (crushed stone):** a) Crushed stone obtained from commercial sources (19,0mm)	m³	1 040		
TOTAL CARRIED TO SUMMARY							

ITEM	PAYMENT CLAUSE	(LI)	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SABS 1200L		**SECTION 4: MEDIUM PRESSURE PIPELINES**				
4			**WATER PIPELINE**				
4,1			**Rising Main - uPVC**				
	PSL 8.2.1		**Class 16 UPVC pipes in 6m lengths**				
			Supply, Lay, joint and bed Pipes:				
4.1.1		LI	355mm dia, UPVC class 16	m	4 000		
4.1.2			**Extra-over 8.2.1 for the Supplying, Laying, and Bedding of Specials Complete with Couplings Specials and Fittings in uPVC**				
			Class 16 Bends for 355mm Ø uPVC pipe :				
4.1.3			90° Bends	No	2		
4.1.4			45° Bends	No	4		
4.1.5			22½° Bends	No	6		
4.1.6			11¼° Bends	No	2		
4.1.8			End cap	No	2		
4.2			Tie-in to existing new reservoir at Carolina Reservoir in Silobela, Extension 5	Prov. Sum	1		
			Unequal Tees (Socketed)				
4.2.1			355mm x 250mm x 355mm dia	No	16		
4,3			Equal Tees (Flanged complete with jointing materials, bolts, gaskets etc)				
4.3.1			355mm x 355mm	No	16		
			Reducers (Flanged complete with jointing materials, bolts, gaskets etc)				
TOTAL CARRIED FORWARD							

ITEM	PAYMENT CLAUSE	(LI)	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD							
4.3.2			355mm x 250mm	No	10		
4.3.3			250mm Ø Viking Johnson Flange Adaptor for uPVC pipe complete with jointing materials, bolts, gaskets etc	No	10		
4.3.4			**Anchor/ Thrust Blocks and Pedestals** a) Dimensions as per Drawing	m³	50		
	PSL		**COMMISSIONING** **Commissioning of water pipelines::**				
4.3.5			Hydraulic Pressure Testing - install temporary blank flanges and /or spade pieces as required, provide temporary anchorages, and pressure test the complete pipeline and all fittings, valves and appurtenances, to approval of Engineer	Sum	1		
4.3.6			Disinfection - Disinfect the complete pipeline and all appurtenances after satisfactory completion of pressure testing, to the approval of the Engineer	Sum	1		
4.3.7			Testing of all cast in situ concrete chambers (excluding air valve chambers that are precast concrete) for watertightness and making good if required	No	10		
	8.2.3		**VALVES AND METERS** *Extra-over items for supplying, laying and bedding of meters, valves and hydrants complete with couplings*				
		LI	**Isolation Valves**				
TOTAL CARRIED FORWARD							

ITEM	PAYMENT CLAUSE	(LI)	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
			Flanged Resilient Seated Gate Valve - PN16 - SABS 664 - capped valve for uPVC pipe (valve to exclude hand wheel)				
			As per drawing No. C103				
4.3.8			a) 355mm dia	No	4		
4.3.9			b) Stainless steel key to suit valve	No	4		
4.3.10			c) GRP Flange adaptor PN16 to suit "Vectus" pipe 355mm socket/F	No	8		
4.3.11		**LI**	**Scour Valves**				
			As per drawing C102				
4.3.13			a) 150mm Ø Flanged Water Works Gate Valve To SABS 664	No	2		
4.3.14			b) 150mm Ø GMS Straight, Flanged both ends 1500mm or similar approved, Confirm length on site	No	2		
4.3.15			c) 150mm Ø, 45° GMS Elbow, Flanged both ends	No	2		
4.3.16			d) 150mm Ø GMS Straight, Flanged both ends 1000mm, Confirm length on site	No	2		
4.3.17			e) 150mm Ø GMS Straight, Flanged both ends 1150mm, Confirm length on site	No	2		
4.3.18			f) 150mm Ø Equal t-piece, Branch flanged as per detail	No	2		
4.3.19			g) 150 - 355mm Ø, T-piece with 100mm branch as shown (610mm long) All ends flanged	No	2		
4.3.20			h) Flange adaptor to suit connecting pipework	No	4		
4.3.21			i) VJ Coupling	No	2		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
4,4		**LI**	**Air Valves (16bar)** **As per drawing No. C101**				
4.4.1			a) 150mm Ø Air valve "Vent-O-Mat" RBX Type or similar approved (16bar)	No	10		
4.4.2			b) GMS Straight, threaded both ends to suit tee flange and air valve flange typical length 200mm, confirm length on site.	No	10		
4.4.3			c) 150mm Ø RSV Gate valve - Refer long section	No	10		
4.4.4			d) 150-355mm Ø Unequal steel tee, all ends flanged - To suit connecting pipe	No	10		
4.4.5			e) 150mm Ø GMS Straight, flanged both ends to suit tee flange and RSV valve flange, typical length 300mm, Confirm length on site	No	10		
4.4.6			f) 355mm Ø Flange adaptor to suit connecting pipework	No	20		
4.4.7			g) VJ Coupling	No	10		
4.4.8			h) Stainless steel key to suit valve	No	1		
TOTAL CARRIED TO SUMMARY							

ITEM	PAYMENT CLAUSE	(LI)	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
5			**<u>SECTION 5: SUNDRIES</u>**				
5,1			***VALVE, HYDRANT AND METER CHAMBERS*** ***Supply materials and construct complete chambers . Pipes and fittings scheduled separately***				
		LI	Supply and build isolation valve chamber and air valve chamber installation complete as shown on Detail				
5.1.1			of overall depth not exceeding 1,0 m	No	1		
5.1.2			of overall depth not exceeding 2.0 m	No	1		
5.1.3			of overall depth not exceeding 2.5 m	No	2		
		LI	Supply and construct complete scour valve chamber including for manhole cover and frame air ventilators and building in pipework				
5.1.4			of overall depth not exceeding 1,0 m	No	1		
5.1.5			of overall depth not exceeding 2.0 m	No	1		
5.1.6			of overall depth not exceeding 2.5 m	No	1		
		LI	Supply and construct complete meter chambers including for manhole cover and frame air ventilators and building in pipework as shown on Drawing No				
5.1.7			of overall depth not exceeding 1,0 m	No	1		
5.1.8			of overall depth not exceeding 2.0 m	No	1		
5.1.9			of overall depth not exceeding 2.5 m	No	1		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
5,2			**Marker Posts**				
5.2.1		LI	Supply and install pipe route at all horizontal bends on pipeline and where ordered by Engineer, including for painting twice with white road marking paint and concrete surround	No	52		
5.2.3		LI	Supply and install IV ,SV and AV marker posts including for painting twice with white road marking paint and concrete surround	No	16		
5,3			**Chamber Maverick Key**				
5.3.1			Supply maverick key for covers	No	16		
TOTAL CARRIED TO SUMMARY							

ITEM	PAYMENT CLAUSE	(LI)	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
6			**SECTION 6 -PUMPSTATION**				
6.1	**SANS 1200C**		**Site Clearance**				
6.1.1	8.2.1		Clear and Grub Pump station site	m²	520		
	8.2.2		**Remove and grub large trees and tree stumps of girth:**				
6.1.2			a) over 1m and up to and including 2m	No.	2		
6.1.3			b) over 2m and up to and including 3m	No.	2		
6.1.4	8.2.5		Take down existing fences	km	0,1		
6.1.5	8.2.10		Remove topsoil to a nominal depth of 150mm and stockpile	m³	80		
6,2	**SANS1200D**		**Earthworks**				
	8.3.2		**Bulk Excavation**				
6.2.1			a) Excavate in all materials and use for embankment or backfill or dispose of as ordered for:				
6.2.2			i) For pump station platform	m³	100		
			b) Extra- over for				
6.2.3			i) Intermediate excavation	m³	25		
6.2.4			ii) Hard rock excavation	m³	25		
	8.3.3		**Restricted Excavation**				
6.2.5			**a) Excavate for restricted foundations, footings, and pipe trenches in all materials and use for backfill or embankment or dispose for:**				
6.2.6			i) Pump station	m³	90		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
	8.3.8		**Existing Services**				
6.2.7			c) Excavate by hand in soft material to expose underground services	m³	295		
6.2.8	**PSD-5.1.2.5**		Pipeline Connection from new Pumphouse to existing Clear Water Sump	Sum	1		
6.2.9			Core drill through existing RC sump wall, Ø355mm, full wall thickness	No.	1		
6.2.10			Supply and fix 355mm diameter puddle flange on pipe, complete with bolts and gaskets	No.	1		
6.2.11			Fill annular space around sleeve and puddle flange with non-shrink grout seal, SANS-approved	m³	5		
6.2.12	8.3.4		Importation, placing and compaction of G7 gravel to grade level to 98% MOD AASHTO (at OMC) in layers not exceeding 200mm to replace pockets or layers of unsuitable material where directed by Engineer (Prov)	m³	40		
	8.3.3		Overhaul				
6.2.13			a) Limited Overhaul (Provisional)	m³	30		
6.2.14			b) Long Overhaul (Provisional)	m³.km	30		
	SANS 1200DM		**EARTHWORKS (ROADS, SUB-GRADE) - UNDER STRUCTURE**				
6.2.15	8.3.3		Treatment of Roadbed (Under Structure)				
TOTAL CARRIED FORWARD							

ITEM	PAYMENT CLAUSE	(LI)	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
6.2.16			a) Road-bed preparation and compaction of material to: i) minimum of 90% modified AASHTO maximum density	m³	1 800		
	SANS 1200ME 8.3.5		**SUBBASE (STABILIZATION UNDER STRUCTURE) - PROVISIONAL** Process material by the following process, as relevant and use under structure on instruction by Engineer				
6.2.17			a) Screening	m³	1 170		
6.2.18			b) Heavy grid rolling	m³	1 170		
6.2.19			c) Stabilization (6% Cement)	m³	1 170		
	8.3.8		Stabilising Agent				
6.2.20			a) Portland Cement	t	1 170		
6,3	**SANS1200G**		CONCRETE STRUCTURAL	-			
6.3.1	8.2		Formwork				
6.3.2	8.2.4		Special off form to:	-			
6.3.3			a) soffit to roof slab	m²	130		
6.3.4			b) pump station plinths	m²	3		
6.3.5			c) 20 x10 drip to roof pump station	m	15		
	8.2.5		Narrow widths up to 300mm wide				
6.3.6			a Pump station foundations	m	13		
	8.2.6		Box out Holes/ Form Voids -				
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
6.3.7			a) Small circular, of diameter up to and including 0,35m				
6.3.8			i) 250mm diameter	No.	5		
	8.3.1		Reinforcement				
6.3.9			a) mild steel	ton	6		
6.3.10			b) High tensile steel	ton	6		
	8.4		**Concrete**				
6.3.11			Screed - 1:3 Cement/ Sand	m³	25		
6.3.12			No fines Concrete to underdrain system	m³	25		
6.3.13			15MPa concrete to platforms, aprons, steps, pipe supports etc.	m³	25		
6.3.14	8.4.3		Concrete, Grade 25MPa/ 19mm for:				
6.3.15			i) Pump station footings	m³	13		
6.3.16			ii) Pump station floor	m³	20		
6.3.17			iii) Pump station roof	m³	20		
			Unformed surface finishes				
6.3.18			a) Wood floated	m²	130		
6.3.19			b) Steel floated	m²	130		
6,4			Joints				
6.4.1			Construct construction joints for: Isolations joint at floor/wall junction	m	52		
6.4.2			Horizontal roof sliding joint on top of wall. Rate to include for two layers of tempered masonite and two layers or 3 ply malthoid	m	52		
6.4.3			Roof water proofing	m	52		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
6,5			**Construct Road access to Pump Station**				
6.5.1			150mm G5 compacted to 95% Mod AASHTO	m²	13 000		
6.5.2			150mm G7 compacted to 95% Mod AASHTO	m²	13 000		
6.5.3			150mm insitu material compacted to 95% Mod AASHTO	m²	13 000		
6,6			**Sundry Items**				
6.6.1			355mm dia. uPVC sleeves long radius 90 degree	No.	5		
			Building Work				
6.6.2			230mm thick external Face brick Wall - Coro brick " Firelight Satin" or similar Approved for internal / external wall of Pumpstation	m²	208		
6.6.3			Pump stations double doors	Sum	2		
6.6.4			Pump station single doors	Sum	1		
6.6.5			Screed to pump station roof slab	m³	130		
6.6.6			Windows to pump station as per drawing	No	5		
6.6.7			Airbricks to pump station building and chambers	No.	5		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
6,7	**SANS 1200HA**		Structural steel work (Sundry Items)			.	
6.7.1			Supply and install expanded metal grid including angled frames with fishtails to cast in to concrete to all floor channels on pump station	Prov. Sum	1		
6,8			**Site Drainage** Supply and lay "Kaymat U14 or similar approved geotextile, including all laps, cutting and wasting				
6.8.1			**a) Beneath 1m wide gravel apron** Supply and lay to fall as indicated, drainage pipes, including all couplings cuttings and waste	**m²**	**130**		
6.8.2			a) 110mm Ø uPVC pipe for stormwater drainage for pump station	m	10		
6,9			**Fencing** Supply and erect new fencing material for pump station site				
6.9.1			i) Supply and Install 2.4m high, 40MPa Concrete Palisade Fence. Rate to include supply, delivery from source and installation	m	520		
6.9.2			ii) Gates	No.	2		
6.9.3			iii) Barbed tape concertina	m	520		
6,10	**MECHANICAL SPECIFICATION**		**MECHANICAL**				
	A		**Pump Station**				
	A1		**Supply and install water Pumps as Specified in the drawings and standard specification and detailed specification**				
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
6.10.1	1		Supply and install 324 cubic metre/hr (m3/h) Single stage centrifugal pumps with a drive power of 110kW, impeller size 490,6mm and head of 80m. Pump operation philosophy should be one standby/ one duty. Pumps to be supplied complete with Steel base plate and couplings	No.	2		
6.10.2	2		Allow for the Laser Alignment of the pumps and vibrational analysis	No.	2		
	C2		**PIPEWORK AND ACCESSORIES**				
6.10.3	1		Supply and install Discharge piping system including discharge manifold and including gaskets, nuts, bolts, support brackets and sundry materials, but excluding materials measured below: Refer to drawing No: M101 & M102	Sum	1		
3.10.4	2		Supply and Install DN200mm Gate Valve	No.	2		
6.10.5	3		Supply and install DN200mm Non Return Valve	No.	2		
6.10.6	4		Supply and Install Pressure Transducer/ transmitter/ Digital pressure Gauge	No.	2		
6.10.7	5		Supply and install a No-Flow Switch	No.	2		
6.10.8	6		Supply and Install Pressure Relief Valve (PRV)	No.	1		
6.10.9	7		Supply and Install Electromagnetic Flow Meter with a Digital Display connected by cable installed inside the pump station	No.	1		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
6.10.10	8		Supply and install Suction piping system including discharge manifold and including gaskets, nuts, bolts, support brackets and sundry materials, but excluding materials measured below: Refer to drawing No: M101 & M102	Sum	1		
6.10.11	9		Supply and install pipe linking existing Clear Water Tank and suction pipe in the new Pump Station	Prov. Sum	1		
6.10.12	10		Supply and Install DN200mm Gate Valve	Item	2		
6.10.13	11		Supply and Install ultrasonic level Sensor at the two Reservoirs (Suction tank and Discharge) and linked to the SCADA display system	No.	2		
6.10.14	12		Supply and install an DN355mm Isolation Gate Valve	No.	1		
6.10.15	13		Link and Connect the Level sensor to the Pump Controller	Item	1		
6.10.16	13		Develop and Produce shopfloor drawings for Approval	Item	1		
	C3		**PROJECT ENGINEERING AND QUALITY MANAGEMENT** Testing, commissioning and handover of Pumping system, including pressure testing and inspection and compilation of plans submitted to the Engineer for approval.				
6.10.17	1		Operation and Maintenance Instruction Manuals	set	4		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
6.10.18	2		User Training	Item	1		
			TEST & COMMISSION				
6.10.19	3		Test and Commission Pumping system	Item	1		
TOTAL CARRIED TO SUMMARY							

ITEM	PAYMENT CLAUSE	(LI)	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
7	SABS 1200		**SECTION 7: ELECTRICAL & INSTRUMENTATION**				
7.1			**Section 1** **LV supply cable: Allow for all the costs and expenses in connection with the design, manufacture, routine testing, supply, delivery, offloading, storage and installation of the following materials:**				
7.1.1			Supply and installation of 50mm² 4 core +earth PVC bedded SWA PVC sheathed 600/1000V Cable	m	300		
7.1.2			Cable trench excavation and backfilling	m	150		
7.1.3			Excavation in soil 550 mm deep	m	150		
7.1.4			Intermediate excavation	m³	10		
7.1.5			Hard rock/ Concrete excavation	m³	20		
7.1.6			Hard rock/ Concrete excavation	m³	20		
7.1.7			Removal and dumping of access material including all handling	m³	35		
7.1.8			Exposing by hand to exposed civil pipework on the trench route	m³	10		
7.1.9			Removing of paving and backfilling with paving	m²	10		
7.1.10			Cable ladder with accessories	m	6		
7.1.11			6 meter of 110 diameter flexible cable sleeves	No	5		
7.1.12			LV cable tests and commissioning	Sum	1		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
7.2			**Section 2** **MCC equipped with PLC cabinet and free standing VSDs as illustrated in the MCC GA drawing no. 501: Allow for all the costs and expenses in connection with the design, manufacture, routine testing, supply, delivery, offloading, storage and installation of the following materials:**				
7.2.1			MCC metal work and free standing VSDs	Sum	1		
7.2.2			MCC assembly and accessories	Sum	1		
7.2.3			MCC installation and energising	Sum	1		
7.2.4			MCC testing and commissioning	Sum	1		
7.2.5			PLC cabinet metal work	Sum	1		
7.2.6			PLC cabinet assembling and programming	Sum	1		
7.2.7			PLC cabinet installation and energising	Sum	1		
7.2.8			PLC cabinet testing and commissioning	Sum	1		
7.2.9			550mm diameter axial flow fan with 400mm casing length including all accessories. Airflow of 3.5m3/s motor	Sum	1		
7.2.10			Factory acceptance Test for the MCC and PLC	Sum	1		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
7.3			**Section 3** **Motor and plant connections cables including local start stop, cable ladders, fasteners and accessories: Allow for all the costs and expenses in connection with the design, manufacture, routine testing, supply, delivery, offloading, storage and installation of the following materials and equipment** **ALL CABLE LENGTHS ARE ESTIMATED. THE ONUS IS ON THE CONTRACTOR TO MEASURE ACTUAL CABLE LENGTHS DURING CONSTRUCTION AND SUBMIT TO THE ENGINEER FOR APPROVAL BEFORE ORDRING OF ANY CABLES**				
7.3.1			1.5 mm² 4 core +earth XLPE bedded SWA PVC sheathed 600/1000V Cable	m	1 000		
7.3.2			2.5 mm² 4 core +earth XLPE bedded SWA PVC sheathed 600/1000V Cable	m	600		
7.3.3			2.5 mm² 4 core +earth XLPE bedded SWA PVC sheathed 600/1000V Cable	m	600		
7.3.4			4mm² 4 core +earth XLPE bedded SWA PVC sheathed 600/1000V Cable	m	50		
7.3.5			95mm² 4 core +earth XLPE bedded SWA PVC sheathed 600/1000V Cable	m	100		
`7.4			**Section 4** **Supply and install instrumentation and control cables Cu/PVC Insulated/PVC Bedded/SWA/PVC Sheathed 600/1000V multicore control cables with stranded conductors.**				
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
7.4.1			1.5mm² x 2 Core	m	200		
7.4.2			1.5mm² x 4 Core	m	200		
7.4.3			1.5mm² x 7 Core	m	100		
7.5			**Section 5** **Allow for all costs and expenses in connection with design, manufacture, routine testing, factory acceptance testing (if indicated), supply, delivery, offloading, storage and installation of the following materials and equipment: PVC conduits, Heavy Duty Hot Dipped Galvanised Mild Steel cable ladder, complete with T-sections, bends, splices, couplers, clamps, threaded rods, hangers, brackets etc. to fix to trusses, walls etc.**				
7.5.1			Supply and install 500 mm wide heavy duty cable ladders and accessories including bends, splice set, cable fasters etc.. supported on the side of the cale trench wall	m	50		
7.5.2			Supply and install 200 mm wide heavy duty cable ladders and accessories including bends, splice set etc.. from the main ladder to each local station and motor	m	50		
7.5.3			Supply and install 150 mm wide heavy duty cable ladders and accessories including bends, splice set etc.. from the main ladder to each local station and motor	m	30		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
7.5.4			Hot dipped galvanised Mild Steel Wire Mesh Cable Tray, complete with T-sections, bends, splices, couplers, clamps, threaded rods, hangers, brackets etc. to fix to trusses, walls etc.				
7.5.5			Supply and installation of 100x 50 mm (WH) ø 4mm wire	m	20		
7.5.6			Supply and installation of 200x 50 mm (WH) ø 4mm wire	m	20		
7.5.7			Supply and installation of 300x 50 mm (WH) ø 4mm wire	m	20		
7.5.8			4mx20mm ø high-impact rigid PVC conduit, including all necessary couplings, glue, and connectors	m	50		
7.6			**Section 6** **Allow for all costs and expenses in connection with design, manufacture, routine testing, factory acceptance testing (if indicated), supply, delivery, offloading, storage and installation of the following materials and equipment: PVC conduits, Heavy Duty Hot Dipped Galvanised Mild Steel cable ladder, complete with T-sections, bends, splices, couplers, clamps, threaded rods, hangers, brackets etc. to fix to trusses, walls etc.**				
7.6.1			Supply and install 500 mm wide heavy duty cable ladders and accessories including bends, splice set, cable fasters etc.. supported on the side of the cale trench wall	m	50		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
7.6.2			Supply and install 200 mm wide heavy duty cable ladders and accessories including bends, splice set etc.. from the main ladder to each local station and motor	m	50		
7.6.3			Supply and install 150 mm wide heavy duty cable ladders and accessories including bends, splice set etc.. from the main ladder to each local station and motor	m	30		
7.6.4			**Hot dipped galvanised Mild Steel Wire Mesh Cable Tray, complete with T-sections, bends, splices, couplers, clamps, threaded rods, hangers, brackets etc. to fix to trusses, walls etc.**				
7.6.5			Supply and installation of 100x 50 mm (WH) ø 4mm wire	m	20		
7.6.6			Supply and installation of 200x 50 mm (WH) ø 4mm wire	m	20		
7.6.7			Supply and installation of 300x 50 mm (WH) ø 4mm wire	m	20		
7.6.8			4mx20mm ø high-impact rigid PVC conduit, including all necessary couplings, glue, and connectors	m	50		
7.7			**Section 7** **Allow for all costs and expenses in connection with supply, installation and connection from DB to load: Standard cost per outlet for the complete supply and installation of recessed outlets including all required material and labour (conduit, switch conductors, draw-wire, terminations etc.)** **MCC Building Local Lighting and Power**				
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
7.7.1			Supply and installation of Luminaires F9	No.	12		
7.7.2			Three-phase welding plug 25A	No	1		
7.7.3			50W floodlight	No	6		
7.7.4			Switched socket outlets industrial 16 A	No.	2		
7.7.5			Single lever light switch	No.	2		
7.8			**Section 8** **Allow for all costs and expenses in connection with supply, manufacture, routine testing, factory acceptance testing (if indicated), supply, delivery, offloading, storage and installation of the following materials and equipment: EARTHING, LIGHTNING PROTECTION AND BONDING**				
7.8.1			Earth mat installation in the MCC & pump room including test points, etc	Sum	1		
7.8.2			Bonding of equipment such as pipework, cable ladder, etc.	Sum	1		
7.8.3			ANY ITEM NOT MENTIONED ABOVE BUT DEEMED NECESSARY TO PROVIDE A FULLY OPERATIONAL SYSTEM	Sum	1		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
7.9			**Section 9** **Allow for all costs and expenses in connection with supply, manufacture, routine testing, factory acceptance testing (if indicated), supply, delivery, offloading, storage and installation of the following materials and equipment:** **PLC & SCADA Configuration**				
7.9.1			Network cable connections, including required connectors	Sum	1		
7.9.2			Battery backup, cables and enclosure (batteries to provide backup power for 6 hours)	Sum	1		
7.9.3			New fibre optic enclosure with patch panel, media converter, fibre leads and installation hardware	Sum	1		
7.9.4			Fibre cable terminations in patch panel	Sum	1		
7.9.5			Telemetry system	Sum	1		
7.9.6			HMI screen and RTU	Sum	1		
7.9.7			Complete system topology design	Sum	1		
7.9.8			System integration	Sum	1		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
7.10			**Section 10** **Supply and installation and connection at both ends of the following comprehensive instrumentation, including transmitters, display, enclosures and mounting accessories as required:**				
7.10.1			Hydrostatic level meter (0-10m/s) including sensor, transmitter and monitoring materials	No	2		
7.10.2			Wetted ultrasonic flow meter including sensor, transmitter and mounting materials to DN355 pipework, 25bar pressure rating.	No	1		
7.10.3			Pressure switch complete with transmitter including mounting materials	No	2		
7.10.4			Motor winding temperature transmitter and mounting materials	No	12		
7.10.5			Motor bearing temperature transmitter and mounting materials	No	4		
7.10.6			Pump bearing temperature transmitter and mounting materials	No	4		
7.10.7			Motor bearing vibration sensor and transmitter and mounting materials	No	2		
7.10.8			Pump bearing Vibration Sensors and Transmitter and mounting materials	No	2		
7.10.9			Instrumentation and Control junction box complete with terminations, accessories etc.	No	2		
TOTAL CARRIED TO SUMMARY							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
7.10.10			Instrumentation Transmitter housing complete with terminations, accessories etc.	No	3		
TOTAL CARRIED TO SUMMARY							

ITEM	PAYMENT CLAUSE	(LI)	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
8	**PAA.5.1**		**SECTION 8: DAYWORKS**				
8.1			No dayworks will be carried out without an instruction from the Engineer				
8.1.1			Allow for dayworks for sundry items not covered by measured items:				
8.1.2			**LABOUR**				
8.1.3			Site Agent	hrs	200		
8.1.4			Gang Supervisor	hrs	200		
8.1.5			Unskilled Labourers	hrs	200		
8.1.6			Bricklayer	hrs	200		
8.1.7			Pipe Fitter	hrs	200		
8.1.8			Semi Skilled Labourers	hrs	200		
8.1.9			Construction Hand and Operator	hrs	200		
8.1.10			Carpenter	hrs	80		
8.1.11			Clerk	hrs	240		
8.1.12			Artisans	hrs	200		
8.1.13			Foreman	hrs	200		
8.1.14			Welder	hrs	80		
8.1.15			Painter	hrs	80		
TOTAL CARRIED FORWARD							

TOTAL BROUGHT FORWARD							
ITEM	**PAYMENT CLAUSE**	**(LI)**	**DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
8.1.16			Electrician	hrs	80		
8.2			**MATERIALS**				
8.2.1			Provisional sum for cost of material	Sum	1		
8.2.2			Contractors mark-up on material	%	20		
8.2.3			**PLANT**				
8.2.4			T L B	hrs	80		
8.2.5			Light delivery vehicles (1t or equivalent)	km	200		
8.2.6			10 Ton Truck with Crane	km	200		
8.2.7			Generator Set	hrs	200		
8.2.8			Concrete Core Drilling Machine including operators (600mm diameter)	hrs	160		
8.2.9			Pipe Cutting Machine (steel)	hrs	160		
8.2.10			Welding Machine	hrs	160		
8.2.11			Compressor and Jack Hammer	hrs	160		
8.2.12			Tip Truck	hrs	160		
8.2.13			Water Tanker	hrs	160		
8.2.14			Plate Compactor	hrs	160		
TOTAL CARRIED TO SUMMARY							

C2.2 Bill of Quantities

SUMMARY OF SECTION TOTALS

SUMMARY OF SCHEDULES		
SECTION	**DESCRIPTION**	**AMOUNT**
SECTION 1	PRELIMINARIES AND GENERAL	
SECTION 2	SITE CLEARANCE	
SECTION 3	EARTHWORKS (PIPE TRENCHES)	
SECTION 4	MEDIUM PRESSURE PIPELINES	
SECTION 5	SUNDRIES	
SECTION 6	PUMPSTATIONS	
SECTION 7	ELECTRICAL & INSTRUMENTATION	
SECTION 8	DAYWORKS	
SUB-TOTAL A		
Plus 10% for Contingencies on Sub-Total A (Compulsory)		
SUB-TOTAL		
PLUS 15% VAT (Compulsory)		
TOTAL TENDER PRICE		

.....
SIGNED ON BEHALF OF TENDERER:

.....
DATE:

PART C3:

SCOPE OF WORK

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Part C3: SCOPE OF WORKS

C3.1 DESCRIPTION OF WORKS

C3.1.1 EMPLOYERS OBJECTIVES

This project forms part of the **Chief Albert Luthuli Municipality's** overall development of infrastructure within the municipality's boundaries.

C3.1.2 OVERVIEW OF THE WORKS

The contract encompasses the construction of a new 355 dia, 4km long pipeline from Carolina Water Treatment Works to a new 5Ml reservoir in Silobela Extension 5. Silobela is a developing township, with Extension 5 confirmed to provide an additional 2613 new households by the Department of Human Settlement. The existing water infrastructure is not sufficiently capacitated to accommodate the new demand of the new housing units.

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 and are identified in the Bill of Quantities.

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.

C3.1.2.1 EXTENT OF THE WORKS

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 for:

1) Tie- into the existing Clearwater sump at Carolina Water Treatment Works

2) Construct new sump and Booster pumpstation at Carolina Water Treatment Works

3) Lay 4km of 355 dia pipeline from new booster pumpstation to Silobela Ext 5 Reservoir site

4) Tie into reservoir inlet chamber to be constructed under MIG Project

The tenderer shall refer to Annexure B of this document:

DRAWING NO.	DRAWING TITLE	SHEET
G101	GENERAL NOTES	1 OF 1
S201	PUMPSTATION PLANS & ELEVATIONS	1 OF 1
S202	PUMPSTATION SECTIONS & DETAILS	1 OF 1
S203	FOUNDATION LAYOUT, ROOF PLAN & BEAM DETAILS	1 OF 1
SR301	FOUNDATION, FLOOR SLAB, COLUMN REINFORCEMENT & BENDING SCHEDULES	1 OF 1
SR302	BEAN REINFORCEMENT & BENDING SCHEDUL	1 OF 1
SR303	ROOF SLAB REINFORCEMENT & BENDING SCHEDULE	1 OF 1
P101	PUMPHOUSE SITE PLAN	1 OF 2
P102	PLATFORM	2 OF 2
M101	MECHANICAL PUMPSTATION FLOOR PLAN	1 OF 1
M102	MECHANICAL PUMPSTATION FITTINGS	1 OF 1
E100	MCC SINGLE LINE DIAGRAM	1 OF 1

E101	MCC GENERAL ARRANGEMENT	1 OF 1
E102	ELECTRIC LAYOUT	1 OF 1
E103	MCC SCHEMATICS: MAIN INCOMER	1 OF 1
E104	MCC SCHEMATICS: CONTROL TRANSFORMER	1 OF 1
E105	MCC SCHEMATICS: VSD1	1 OF 1
E106	MCC SCHEMATICS: VSD2	1 OF 1
E107	MCC SCHEMATICS: A/C DUCTING FAN	1 OF 1
E108	MCC SCHEMATICS: PLC POWER SUPPLY	1 OF 1
E109	MCC: SCHEMATICS: LOCAL DB	1 OF 1
LS101	SILOBELA, EXTENSION 5 LONGSECTION (CH0.00 TO CH950.00)	1 OF 4
LS102	SILOBELA, EXTENSION 5 LONGSECTION (CH 950 TO CH 1900)	2 OF 4
LS103	SILOBELA, EXTENSION 5 LONGSECTION (CH 1900 TO CH 2850)	3 OF 4
LS104	SILOBELA, EXTENSION 5 LONGSECTION (CH 2850 TO CH 3484.131)	4 OF 4
C100	STANDARD DRAWING NOTES	1 OF 5
C101	AIR VALVE CHAMBER STANDARD DETAIL	2 OF 5
C102	SCOUR VALVE CHAMBER STANDARD DETAIL	3 OF 5
C103	ISOLATION VALVE CHAMBER STANDARD DETAIL	4 OF 5
C104	WATER METER CHAMBER STANDARD DETAIL	5 OF 5

C3.1.2.2 Location of the Works

The project falls within Chief Albert Local Municipality (CALLM) and CALLM is situated in the north-eastern part of Mpumalanga, approximately 62km north of Ermelo and approximately 220km east of Johannesburg. CALLM is one of seven local municipalities under the jurisdiction of the Gert Sibande District Municipality (GDSM). The co-ordinates of the project area are taken at Carolina Water Treatment Works, are Latitude 26° 5'39.78"South and Longitude 30° 5'22.78" East.

C3.1.3 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 only locally 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 C3.1.3 unless otherwise instructed by the Engineer and in accordance with the further provisions of the relevant sections of Part C3 of the Scope of Works.

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

- Clearing and grubbing of the site;
- Hand proving for service detection

- Laying of the pipelines
- Transportation and spoiling of all trench materials, where the disposal site is located within 20 metres of source;
- Construction of water fittings
- Mixing and placing of small concrete works;
- Steel fixing
- Compaction of access roads

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.

C3.1.3.1 Labour intensive competencies of supervisory and management staff

Contractors having a CIDB contractor grading designation of 4CE and higher shall only engage supervisory and management staff in labour intensive works who have either completed, or for the period 1 April 2019 to 30 June 2021, are registered for training towards, the skills programme outlined in Table 1.

The managing principal of the contractor, namely, a sole proprietor, the senior partner, the managing director or managing member of a close corporation, as relevant, having a contractor grading designation of 1CE, 2CE, 3CE and 4CE shall have personally completed, or for the period 1 April 2019 to 30 June 2021 be registered on a skills programme for the NQF level 2. All other site supervisory staff in the employ of such contractors must have completed, or for the period 1 April 2019 to 30 June 2021 be registered on a skills programme for, the NQF level 2 unit standards or NQF level 4 unit standards.

Table 1: Skills programme for supervisory and management staff

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader / supervisor	2	Apply Labour Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, **and**
		Use Labour Intensive Construction Methods to Construct and Maintain Roads and Stormwater Drainage	Any one of these 3 unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Foreman/ supervisor	4	Implement labour Intensive Construction Systems and Techniques	This unit standard must be completed, **and**
		Use Labour Intensive Construction Methods to Construct and Maintain Roads and Stormwater Drainage	Any one of these 3 unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Site Agent / Manager (i.e. the contractor's most senior representative that is resident on the site)	5	Manage Labour Intensive Construction Processes	Skills Programme against this single unit standard

C3.1.3.2 Employment of unskilled and semi-skilled workers in labour-intensive works

C3.1.3.3 Requirements for the sourcing and engagement of labour

1. Unskilled and semi-skilled labour required for the execution of all labour-intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour.

2. The rate of pay set for the EPWP for the use of local labour is set at a minimum rate per day, agreed with the Chief Albert Local Municipality.

3. Tasks established by the contractor must be such that:

    i. the average worker completes 5 tasks per week in 40 hours or less; and,
    ii. the weakest worker completes 5 tasks per week in 55 hours or less.

4. The contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of C3.4.3.2.1

5. The Contractor shall, through all available community structures, inform the local community of the labour-intensive works and the employment opportunities presented thereby. Preference must be given to people with previous practical experience in construction and / or who come from households:

    a) where the head of the household has less than a primary school education;
    b) that has less than one full time person earning an income;
    c) where subsistence agriculture is the source of income.
    d) those who are not in receipt of any social security pension income

6. The Contractor shall endeavour to ensure that the expenditure on the employment of temporary workers is in the following proportions:

    a) 60 % women;
    b) 20% youth who are between the ages of 18 and 35; and
    c) 2% on persons with disabilities.

C3.1.3.4 Payment for the Labour-Intensive Component of the Works:

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

C3.1.3.5 Applicable Labour Law

The Ministerial Determination 4: Expanded Public Works Programmes, issued in terms of the Basic Conditions of Employment act of 1997 by the Minister of Labour in Government Notice NR347 of 4 May 2012, as reproduced below, shall apply to works described in the scope of work as being labour intensive and which are undertaken by unskilled or semi-skilled workers. An EPWP contract shall be signed between the contractor and the EPWP participant using the template appended. The contracts shall expire on earlier of (i) 31 March, (ii) at the end of the project; or (iii) completion of the works allocated.

C3.1.3.6 Introduction

This document contains the standard terms and conditions for workers employed in elementary occupations on an Expanded Public Works Programme (EPWP). These terms and conditions do NOT apply to persons employed in the supervision and management of an EPWP.

In this document –

(a) “department” means any department of the State, implementing agent or contractor;

(b) “employer” means any department, implementing agency or contractor that hires workers to work in elementary occupations on a EPWP;

(c) “worker” means any person working in an elementary occupation on a EPWP;

(d) “elementary occupation” means any occupation involving unskilled or semi-skilled work;

(e) “management” means any person employed by a department or implementing agency to administer or execute an EPWP;

(f) “task” means a fixed quantity of work;

(g) “task-based work” means work in which a worker is paid a fixed rate for performing a task;

(h) ″task-rated worker″ means a worker paid on the basis of the number of tasks completed;

(i) ″time-rated worker″ means a worker paid on the basis of the length of time worked.

C3.1.3.7 Terms of Work

(a) Workers on an EPWP are employed on a temporary basis or contract basis

C3.1.3.8 Normal Hours of Work

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

i. more than forty hours in any week

1. on more than five days in any week; and
2. for more than eight hours on any day.

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

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

C3.1.3.9 Meal Breaks

(a) A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.

(b) An employer and worker may agree on longer meal breaks.

(c) A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.

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

C3.1.3.10 Special Conditions for Security Guards

(a) A security guard may work up to 55 hours per week and up to eleven hours per day.

(b) A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

C3.1.3.11 Daily Rest Period

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

C3.1.3.12 Weekly Rest Period

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

C3.1.3.13 Sick Leave

(a) Only workers who work for more than 24 hours have the right to claim sick-pay in terms of this clause

(b) A worker who is unable to work on account of illness or injury is entitled to claim one Day's paid sick leave for every full month that the worker has worked in terms of a contract.

(c) A worker may accumulate a maximum of twelve days' sick leave in a year

(d) Accumulated sick-leave may not be transferred from one contract to another contract.

(e) An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.

(f) An employer must pay a time-rated worker the worker's daily rate of pay for a day's

(g) An employer must pay a worker sick pay on the worker's usual payday.

(h) Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is –

(i) absent from work for more than two consecutive days; or

(j) absent from work on more than two occasions in any eight-week period.

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

(l) A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Diseases Act.

C3.1.3.14 Maternity Leave

(a) A worker may take up to four consecutive months' unpaid maternity leave.

(b) A worker is not entitled to any payment or employment-related benefits during maternity leave.

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

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

(e) A worker may begin maternity leave -
    a. four weeks before the expected date of birth; or

b. on an earlier date –

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

ii. if agreed to between employer and worker; or

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

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

C3.1.3.15 Family responsibility leave

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

(a) when the employee's child is born;

(b) when the employee's child is sick;

(c) in the event of a death of –

(d) the employee's spouse or life partner;

(e) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

C3.1.3.16 Statement of Conditions

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

(a) the employer's name and address and the name of the EPWP;

(b) the tasks or job that the worker is to perform; and

(c) the period for which the worker is hired or, if this is not certain, the expected duration of the contract;

(d) the worker's rate of pay and how this is to be calculated;

(e) the training that the worker will receive during the EPWP.

(f) An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.

(g) An employer must supply each worker with a copy of these conditions of employment.

C3.1.3.14 Keeping Records

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

(a) the worker's name and position;

(b) Certified ID copies of all locally employed labour

(c) Signed Contracts between the employer and the EPWP Participants

(d) Attendance Registers for the EPWP Participants

(e) Monthly Reporting Template as per EPWP requirements

(f) in the case of a task-rated worker, the number of tasks completed by the worker;

(g) in the case of a time-rated worker, the time worked by the worker;

(h) Proof of payments made to each worker.

(i) The employer must keep this record for a period of at least three years after the

(j) completion of the EPWP.

C3.1.3.15 Payment

(a) An employer must pay all wages at least monthly in cash or by cheque or into a bank account.

(b) A worker may not be paid less than the minimum EPWP wage rate per day or per task. This will be adjusted annually on the 1st of November in-line with inflation (available CPI as provided by StatsSA six (6) weeks before implementation).

(c) A task-rated worker will only be paid for tasks that have been completed.

(d) An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.

(e) A time-rated worker will be paid at the end of each month.

(f) Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.

(g) Payment in cash or by cheque must take place –

a. at the workplace or at a place agreed to by the worker;

b. during the worker′ s working hours or within fifteen minutes of the start or finish of work;

c. in a sealed envelope which becomes the property of the worker.

(h) An employer must give a worker the following information in writing –

a. the period for which payment is made;

b. the numbers of tasks completed or hours worked;

c. the worker's earnings;

d. any money deducted from the payment;

e. the actual amount paid to the worker.

(i) If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.

(j) If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

C3.1.3.16 Deductions

(a) An employer may not deduct money from a worker′ s payment unless the deduction is required in terms of a law.

(b) An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

(c) An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.

(d) An employer may not require or allow a worker to –

a. repay any payment except an overpayment previously made by the employer by mistake;

b. state that the worker received a greater amount of money than the employer actually paid to the worker; or

c. pay the employer or any other person for having been employed.

C3.1.3.17 Health and Safety

(a) Employers must take all reasonable steps to ensure that the working environment is healthy and safe.

(b) A worker must –

a. work in a way that does not endanger his/her health and safety or that of any other person;

b. obey any health and safety instruction;

c. obey all health and safety rules of the EPWP;

d. use any personal protective equipment or clothing issued by the employer;

e. report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

C3.1.3.18 Compensation for Injuries and Diseases

(a) It is the responsibility of the employers (other than a contractor) to arrange for all persons employed on an EPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.

(b) A worker must report any work-related injury or occupational disease to their employer or manager.

(c) The employer must report the accident or disease to the Compensation Commissioner.

(d) An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded

this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

C3.1.3.19 Termination

(a) The employer may terminate the employment of a worker for good cause after following a fair procedure.

(b) A worker will not receive severance pay on termination.

(c) A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.

(d) A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract.

(e) However, the worker may be re-engaged if a position becomes available.

(f) A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available.

C3.1.3.20 Certificate of Service

On termination of employment, a worker is entitled to a certificate stating –

(a) the worker's full name;

(b) the name and address of the employer;

(c) the EPWP on which the worker worked;

(d) the work performed by the worker;

(e) any training received by the worker as part of the EPWP;

(f) the period for which the worker worked on the EPWP;

(g) any other information agreed on by the employer and worker.

C3.1.3.21 Contractor's default in payment to Labourers and Employees

(a) Any dispute between the Contractor and labourers, regarding delayed payment or default in payment of fair wages, if not resolved immediately may compel the

(b) Employer to intervene.

(c) The Employer may, upon the Contractor defaulting payment, pay the moneys due to the workers not honoured in time, out of any moneys due or which may become due to the Contractor under the Contract.

C3.1.3.22 Provision of Hand tools

(a) The Contractor shall provide his labour force with hand tools of adequate quality, sufficient in numbers and make the necessary provisions to maintain the tools in good and safe working conditions

C3.1.3.23 Reporting

The Contractor shall submit monthly returns/reports as specified below:

(a) Signed Master rolls/pay sheets of temporary workers and permanent staff detailing the number, category, gender, rate of pay and daily attendance.

(b) Certified ID copies of all locally employed labour

(c) Signed Contracts between the employer and the EPWP Participants

(d) Attendance Registers for the EPWP Participants

(e) Monthly Reporting Template as per EPWP requirements

(f) Plant utilization returns

(g) Progress report detailing production output compared to the programme of works

C3.1.3.24 UNEMPLOYMENT INSURANCE FUND

The contractor will be responsible for payment or contribution of UIF for all labour employed under the project. Proof of payment of UIF shall be available upon request.

C3.1.3.25 WORKMEN'S COMPENSATION ACT

All labour employed on the site shall be covered by the Workmen's Compensation Act. The contractor shall pay in full, including the payment of the necessary levies, such amounts, as are due in terms of the Act. The contractor at the commencement of the contract shall resolve the manner in which Workmen's Compensation will be handled. Amounts paid by the contractor shall not be included in the wage rates but shall be an extra payment allowed for by the contractor.

C3.1.3.26 Specific provisions pertaining to SANS 1914-5

Definitions

Targeted labour: Unemployed persons who are employed as local labour on the project.

C3.1.3.27 Contract participation goals

The contract participation goal is **30%** of the total contract value. The contract participation goal shall be measured in the performance of the contract to enable the employment provided to targeted labour to be quantified.

The wages and allowances used to calculate the contract participation goal shall, with respect to both time-rated and task rated workers, comprise all wages paid and any training allowance paid in respect of agreed training programmes.

C3.1.3.28 Terms and conditions for the engagement of targeted labour

Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.

C3.1.3.7 Variations to SANS 1914-5

1. The definition for net amount shall be amended as follows:

Financial value of the contract upon completion, exclusive of any value added tax or sales tax, which the law requires the employer to pay the contractor.

The schedule referred to in **C3.3.2.1 (6)** shall in addition reflect the status of targeted labour

as women, youth and persons with disabilities and the number of days of formal training provided to targeted labour.

C3.1.3.8 Training of targeted labour

a. The contractor shall provide all the necessary on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract in a manner that does not compromise worker health and safety.

b. The cost of the formal training of targeted labour will be funded by the provincial office of the Department of Labour. This training should take place as close to the project site as practically possible. The contractor, must access this training by informing the relevant provincial office of the Department of Labour in writing, within 14 days of being awarded the contract, of the likely number of persons that will undergo training and when such training is required. The employer must be furnished with a copy of this request.

c. A copy of this training request made by the contractor to the DOL provincial office must also be faxed to the EPWP Training Director in the Department of Public Works – Cinderella Makunike, Fax Number 012 328 6820 or email cinderella.makunike@dpw.gov.za Tel: 083 677 4026.

d. The contractor shall be responsible for scheduling the training of workers and shall take all reasonable steps to ensure that each beneficiary is provided with a minimum of six (6) days of formal training if he/she is employed for 3 months or less and a minimum of ten (10) days if he she is employed for 4 months or more.

e. The contractor shall do nothing to dissuade targeted labour from participating in training programmes.

f. An allowance equal to 100% of the task rate or daily rate shall be paid by the contractor to workers who attend formal training.

g. Proof of compliance with the requirements of items above must be provided by the Contractor to the Employer prior to submission of the final payment certificate.

C3.1.4 Sub-Contracting

C3.1.4.1 Contractor shall appoint such authorities and/or specialist sub-contractors and suppliers as may be designated or nominated by the Employer or the Engineer.

C3.1.4.2 The Contractor shall sub-let to local small sub-contractors appropriate portions of the works that are designated in Clause C3.1.3 as being reserved for labour intensive construction methods.

C3.1.4.3 As required by Clause 4.4.5 of the Conditions of Contract, the Contractor shall be responsible for all work carried out by sub-contractors (whether nominated by the Employer or selected by the Contractor) on his behalf. The Engineer will not liaise directly with any such sub-contractor, nor will he become involved in any problems and/or disputes related to payments, programming, workmanship, etc. unless provided for in the Conditions of Contract. Such problems and/or disputes shall remain the sole concern of the Contractor and his sub-contractors.

C3.1.4.4 The Engineer may at his discretion, upon receipt of a written and fully motivated application from the Contractor, and where he deems the circumstances so warrant, and provided always that the Contractor has complied fully and in all respects with the provisions of the Contract pertaining to subletting to local sub-contractors or has utilised his best endeavours to comply therewith, authorise in writing that the Contractor may employ local residents with the sole intent of executing on-the-job training of such local residents to suitable levels of skill that will enable the Contractor to sub-let appropriate portions of the Works to such local residents.

Without limiting the generality of application of this sub-clause, circumstances, which may be considered by the Engineer to warrant such authorization, include:

a) non-receipt of valid or acceptable tenders/quotations from local sub-contractors;

b) serious default or failure of appointed local sub-contractors;

The Engineer shall not grant such authority in cases where it may reasonably be concluded on the available evidence that the invitation of further tenders/quotations in accordance with the terms of the Contract, is likely to result in the successful completion of the portions of the Works concerned by local sub-contractors.

Should the Contractor, after suitable due endeavour, be unable to identify local residents suitable for and desiring to train as sub-contractors for portions of the Works as specified in Clause 3.1.4.2, then the Contractor shall be permitted to undertake the Works in question with his own workforce as provided for in Clause 3.1.3 above.

The Engineer shall monitor progress achieved with sub-contractor training, and successful completion of this training shall be subject to his approval or instruction. The Contractor shall tender rates for the training of sub-contractors and labour.

As specified in Clause C3.1.4, the Contractor shall approach the Labour Desk that is established for purposes of the Contract for assistance and advice regarding conditions of employment, minimum wages, disputes and disciplinary procedures in respect of local sub-contractors.

C3.1.5 Construction and Management Requirements

C3.1.5.1 General

The Contractor is referred to SANS 1921: 2004 parts 1, 2, 3 and 5: Construction and Management Requirements for Works Contracts. These specifications shall be applicable to the contract under consideration and the Contractor shall comply with all requirements relevant to the project.

Certain aspects however require further attention as described hereafter.

C3.1.5.2 Quality Assurance (QA) (Read *with SANS 1921 – 1: 2004 clause 4.4)*

The Contractor will be solely responsible for the production of work that complies with the Specifications to the satisfaction of the Engineer. To this end it will be the full responsibility of the Contractor to institute an appropriate Quality Assurance (QA) system on site. The Engineer will audit the Contractor's quality assurance (QA) system on a regular basis to verify that adequate independent checks and tests are being carried out and to ensure that the Contractor's own control is sufficient to identify any possible quality problems, which could cause a delay or failure.

The Contractor shall ensure that efficient supervisory staff, the required transport, instruments, equipment and tools are available to control the quality of his own workmanship in accordance with his QA-system. His attention is drawn to the fact that it is not the duty of the Engineer or the Engineer's representative to act as foreman or surveyor.

C3.1.5.3 Management and disposal of water *(Read with SANS 1921 - 1: 2004 clause 4.6)*

The Contractor shall pay special attention to the management and disposal of water and stormwater on the site. It is essential that all completed works or parts thereof are kept dry and properly drained. Claims for delay and for repair of damage caused to the works as a result of the Contractor's failure to properly manage rain and surface water, will not be considered.

C3.1.5.4 Disposal of spoil or surplus material *(Read with SANS 1921 - 1: 2004 clause 4.10)*

The Contractor shall dispose all surplus and unsuitable material at a legal and registered landfill sites within the Municipal area. He shall be responsible for all arrangements necessary to obtain such legal and registered landfill sites from the Municipality.

C3.1.5.6 Testing *(Read with SANS 1921 – 1: 2004 clause 4.11)*

- **Process control**

The Contractor shall arrange for all tests required for process control to be done by a laboratory acceptable to and approved by the Engineer.

The Contractor may establish his own laboratory on site or he may employ the services of an independent commercial laboratory. Whatever method is used, the Contractor must submit the results of tests carried out on materials and workmanship when submitting work for acceptance by the Engineer. The costs for these tests shall be deemed to be included in the relevant rates and no additional payment will be made for testing as required.

- **Acceptance control**

The process control test results submitted by the Contractor for approval of materials and workmanship may be used by the Engineer for acceptance control. However, before accepting any work, the Engineer may have further control tests carried out by a laboratory of his choice. The cost of such additional tests will be covered by a provisional sum provided in the schedule of quantities, but tests that failed to confirm compliance with the specifications, will be for the account of the Contractor.

C3.1.5.7 Survey beacons *(Read with SANS 1921 - 1 : 2004 clause 4.15)*

The Contractor shall take special precautions to protect all permanent 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.

C3.1.5.8 Existing Services *(Read with SANS 1921 - 1 : 2004 clause 4.17)*

The Contractor shall make himself acquainted with the position of all existing services before any excavation or other work likely to affect the existing services is commenced.

The Contractor will be held responsible for any damage to known existing services caused by or arising out of his operations and any damage shall be made good at his own expense. Damage to unknown services shall be repaired as soon as possible and liability shall be determined on site when such damage should occur.

C3.1.6 Programme to be supplied by the Contractor

The Contractor's programme shall be essentially in accordance with the overall requirements of the project.

The programme shall not be in the form of a bar chart only but shall show clearly the anticipated quantities of work to be performed each month, together with the manner in which the listed plant and other resources are to be used, as well as the anticipated earnings for the various sections of work.

A network-based programme according to the precedence method shall be required by the Engineer. The programme shall be updated monthly in accordance with the progress made by the Contractor. The updated programme shall be submitted to the Engineer at least two working days prior to monthly meetings.

Failure to comply with these requirements will entitle the Engineer to use a programme based on his own assumptions for the purpose of evaluating claims for extension of time or additional payments.

If, during the progress of the work, the quantities of work performed per month fall below those shown on the programme, or if the sequence of operations is altered or if the programme is deviated from in any other way, the Contractor shall, within one week of having been notified by the Engineer, submit a revised programme and network.

If the programme has to be revised by reason of the contractor falling behind his programme, he shall produce a revised programme showing how he intends to regain lost time in order to ensure completion of the Works within the time of completion as defined in Clause 5.7 of the General Conditions of Contact or any granted extension of time. Any proposal to increase the tempo of work must be accompanied by positive steps to increase production by providing more labour and plant on site, or by using the available labour and plant in a more efficient manner.

Failure on the part of the Contractor to submit the programme or to work according to the programme or revised programmes shall be sufficient reason for the Engineer to take steps as provided in Clause 9.2 of the General Conditions of Contract.

The approval by the engineer of any programme shall have no contractual significance other than the Engineer will be satisfied if the work is carried out according to such programme and that the Contract undertakes to carry out the work in accordance with the programme. It shall not limit the right to the Engineer to instruct the Contractor to vary the programme if required by circumstances. The Contractor is also referred to Clause 5.6 of the General Conditions of Contract when drawing up his programme.

Progress in advance of the programme on certain portions or phases of the Works shall not be considered adequate reason for poor progress on another portion or phase.

C3.1.7 Overhaul

Overhaul has been be provided for, provisionally in this contract. Payment for overhaul on this contract shall be made on Engineer's approval only.

C3.1.8 Site Facilities Available

C3.1.8.1 Location of Site and Depot

The Contractor is responsible to provide a suitable site for his camp and to provide accommodation for his personnel and labourers. If the Employer can make any specific site available to the Contractor, such site will be pointed out to the Contractor. The Contractor must obtain written permission from the landowner and subsequently from the Engineer for the establishment of his camp.

(a) Contractor's Camp Site/Store Yard

Any clearing of the site that is necessary and the making good after de-establishment will be the responsibility of the Contractor.

In addition to the requirements of SANS 1200A clause 8.3.2.2 the following conditions shall also apply:-

(i) None of the existing roads shall be damaged in any way.

(ii) No waterborne sewerage facilities or potable water connection are available on the site. The Contractor shall make his own arrangements in this regard.

(iii) It shall be the responsibility of the Contractor to make good any damage caused to the campsite area or any improvements on it, including services, and for reinstating it to its former condition when vacated. The standard of reinstatement must be to the satisfaction of the Engineer or the owner. Particular attention should be directed to these requirements and written clearances from the relevant Departments or other owners will be required.

C3.1.8.2 Source of Water Supply

The Contractor shall be responsible under the Contract for the supply and distribution at his cost of all water that he may require for purposes of constructing the Works. Accordingly, the Contractor shall pay all connection fees and consumption charges, and at his cost provide all connections, consumption meters, pipe work, storage tanks, transport and other items associated with the supply of water for the Works.

The Contractor shall, subject to the approval of the Engineer, make any necessary arrangements with the relevant authority for the connection(s), and shall provide in his tender for the payment of all charges and costs that are associated with making water available for purposes of constructing the Works.

C3.1.8.3 Source of Power Supply

The Contractor shall be responsible under the Contract for the supply and distribution at his cost of all electricity that he may require for purposes of constructing the Works. Accordingly, the Contractor shall pay all connection and consumption charges, and at his cost provide all connections, transformers, consumption meters, cables, distribution boards and other items that are associated with the supply of electricity for construction of the Works.

The Contractor shall, subject to the approval of the Engineer, make any necessary arrangements with the relevant authority for the connection(s), and shall provide in his tender for the payment of all charges and costs that are associated with making electricity available for purposes of constructing the Works. The distribution of electricity shall be in accordance with the applicable bylaws and regulations of the supply authority.

C3.1.8.4 Accommodation of Employees

No employees except for security guards will be allowed to sleep or be accommodated on the site.

No housing is available for the Contractor's employees and the Contractor shall make his own arrangements to house his employees and to transport them to site.

No informal housing or squatting will be allowed.

The Contractor shall provide the necessary ablution facilities at his campsite and the site of the works for the use of his employees. Chemical toilets only will be allowed where temporary facilities have to be provided.

C3.1.9 Features Requiring Special Attention

C3.1.9.1 Built-up Areas

The Contractor's attention is drawn to the fact that the Works will be constructed through residential areas. The Contractor shall exercise all necessary precautions and take all necessary steps to ensure the safety and convenience of the public. In addition, the Contractor shall provide access for traffic over and through the works, and for residents to their places of abode, all as described in the Specifications. Allowance must be made by the Contractor in his programming for delays resulting from the aforesaid.

The Contractor shall give residents a minimum of 72 hours written notice of his intent to close access to residential stands. The Contractor shall acquire written confirmation from all owners that they are aware of any intended closures of access. No traffic access to a residential stand shall be closed for longer than 48 hours.

C3.1.9.3 Protection of Buildings and Structures

The Contractor shall give all residents or other parties owning a building or structure within an appropriate radius (not less than 100m) from any point of blasting, a minimum of 48 hours notice of his intent to execute any blasting work.

The Contractor shall note all aspects relevant to the condition of the affected buildings and/or structures prior to blasting and shall acquire the signature of the owners/occupants agreeing to such conditions.

Subsequent to blasting, both the Contractor and the owners/occupants shall sign the form confirming the condition of the buildings and/or structures. In the event of damage to existing buildings and/or structures as a result of blasting, remedial work shall be done to the satisfaction of the owners/occupants at the Contractor's expense.

Compliance with this clause will not relieve the Contractor of any of his responsibilities in terms of the Contract.

C3.1.9.4 Care of the Site

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

C3.1.9.5 Control of Water

The Contractor shall at all times and in all respects be responsible for the handling of stormwater from higher-laying areas above the Works, and for the handling of any sub-surface water that may affect the Works. No separate payment shall be made in this regard, as all costs related thereto shall be deemed to be included in the rates tendered for the various items of work that are included in the Schedule of Quantities.

C3.1.10 Management of the environment

The Contractor shall pay special attention to the following:

(a) Natural Vegetation

The Contractor shall confine his operation to as small an area of the site as may be practical for the purpose of constructing the works.

Only those trees and shrubs directly affected by the works and such others as the Engineer may direct in writing shall be cut down and stumped. The natural vegetation, grassing and other plants shall not be disturbed other than in areas where it is essential for the execution of the work or where directed by the Engineer.

(b) Fires

The Contractor shall comply with the statutory and local fire regulations. He shall also take all necessary precautions to prevent any fires. In the event of fire the Contractor shall take active steps to limit and extinguish the fire and shall accept full responsibility for damages and claims resulting from such fires, which may have been caused by him or his employees.

C3.1.11 Workmanship and Quality Control

The onus to produce work that conforms in quality and accuracy of detail to the requirements of the Specifications and of the Drawings rests with the Contractor, and the Contractor shall, at his own expense, institute a quality-control system and provide experienced engineers, foremen, surveyors, materials technicians, other technicians, technical staff and the user department, together with all transport, instruments and equipment to ensure adequate supervision and positive control of the quality of the Works at all stages of the Contract.

The cost of the Contractor’s supervision and process control, including all testing carried out by the Contractor, will be deemed to be included in the rates tendered for the various items of work. The Contractor's attention is drawn to the provisions of the various Standardised Specifications regarding the minimum frequency of process control testing that is to be executed. The Contractor shall, at his own discretion, increase this frequency where necessary to ensure adequate control of the quality of the Works at all times.

Upon completion and submission of each portion of the Works to the Engineer for examination, the Contractor shall furnish the Engineer with the results of relevant tests, measurements and levels, thereby indicating compliance with the Specifications.

The Engineer will not examine or inspect any portion of work submitted for approval unless the request for inspection and approval is accompanied by relevant tests, measurements and levels indicating compliance.

C3.1.12 Samples

Materials or work that do not conform to the approved samples, submitted in terms of Clause 7.4 of the Conditions of Contract, will be rejected. The Engineer reserves the right to submit samples for testing to ensure that the material represented by the samples meet the specification requirements.

C3.1.13 Notices, Signs, Barricades and Advertisements

Notices, signs and barricades (required in terms of Clause 8 of the Conditions of Contract) as well as advertisements may only be erected where approved by the Engineer. The Contractor shall be responsible for their supply, erection, maintenance and ultimate removal and shall make provision for this in his tendered rates.

The Engineer shall have the right to have any sign, notice or advertisement moved to another location, or to have it removed from the Site of the Works, should it in any way prove to be unsatisfactory, inconvenient or dangerous to the general public.

C3.1.14 Requirements for Accommodation of Traffic

General

The Contractor will be responsible for the safe and easy passage of public traffic past and on sections of roads of which he has occupation or where work has to be done near traffic.

Access to site includes a rail crossing across an operational railway line. The contractor shall be responsible for ensuring that safety is adhered to and Transnet Rail is informed of such Works prior to undertaking the construction.

Accommodation of traffic, where applicable shall comply with SANS 1921-2: 2004: Construction and Management Requirements for Works Contracts, Part 2: Accommodation of Traffic on Public Roads occupied by the Contractor. The Contractor shall obtain this specification from Standards South Africa if accommodation of traffic will be involved on any part of the construction works.

Basic Requirements

The travelling public shall have the right of way on public roads, and the Contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard on the road. The Contractor shall ensure that all road signs, barricades, delineators, flagmen and speed controls are effective and that courtesy is extended to the public at all times.

Failure to maintain road signs, warning signs or flicker lights, etc, in a good condition shall constitute ample reason for the Engineer to suspend the work until the road signs, etc, have been repaired to his satisfaction.

The Contractor may not commence constructional activities affecting existing roads before adequate provision has been made to accommodate traffic in accordance with the requirements of this document and the South African Road Traffic Signs Manual.

The Contractor shall construct and maintain all temporary drainage works necessary for temporary deviations.

The Contractor shall provide and grant access to persons whose properties fall within or adjoin the area in which he is working.

C3.1.15 Community Liaison and Community Relations

In all dealings with nearby communities and beneficiaries of the project, and in all dealings with workers employed from within such communities, the Contractor shall take due cognisance of the character, culture and circumstances of the specific community and/or any group of beneficiaries, and shall at all times use his best endeavours to avoid the development of disputes and rather to foster a spirit of co-operation and harmony towards the project.

The Contractor shall at all times, keep the Engineer fully informed regarding all matters affecting or negotiated between the Contractor and the community and/or beneficiaries, and he shall attend all liaison meetings as may be arranged by the Engineer and/or the Employer. All matters concerning the community and/or beneficiaries shall be discussed and where possible, resolved at such meetings.

Where any resolution during such negotiations or at such meetings shall be contrary to the terms and provisions of the Contract, the Contractor shall not give effect thereto without a prior written instruction from the Engineer. Where the Contractor is of the opinion that any instruction of the Engineer issued in terms of this clause will result in the incurring of additional costs which were not provided for in his tendered rates and prices and/or that a delay in the progress of the Works will result, he shall be entitled to submit a claim in terms of Clause 10 of the Conditions of Contract, provided always that the period of twenty-eight (28) days referred to in Clause 10 shall be reduced to three (3) normal working days in respect of all claims submitted in terms of this clause.

a. Duties of the Community Liaison Officer

i. To be available on site daily between the hours of 07h30 and 16:30 and at other times as the need arises. His normal working day will extend from 07h30 morning until 16h30 in the afternoon.

ii. To determine, in consultation with the contractor, the needs of the temporary labour for relevant skills training. He will be responsible for the identification of suitable trainees and will attend one of each of the training sessions.

iii. To communicate daily with the contractor and the engineer to determine the labour requirements with regard to numbers and skill, to facilitate in labour disputes and to assist in their resolution.

iv. To assist in and facilitate in the recruitment of suitable temporary labour and the establishment of a “labour desk”.

v. To attend all meetings in which the community and/or labour are present or are required to be represented.

vi. To assist in the identification, and screening of labourers from the community in accordance with the contractor’s requirements.

vii. To inform temporary labour of their conditions of temporary employment and to inform temporary labourers as early as possible when their period of employment will be terminated.

viii. To attend disciplinary proceedings to ensure that hearings are fair and reasonable.

ix. To keep a daily written record of his interviews and community liaison.

x. To attend monthly site meetings to report on labour and RDP matters.

xi. All such other duties as agreed upon between all parties concerned.

xii. To submit monthly returns regarding community liaison

b. Payment for the community liaison officer

A special pay item is incorporated in section 1200 of the bill of quantities relating to payment of the liaison officer on a prime cost sum basis. This payment shall only be made for the period for which the duties of the liaison officer are required and not necessarily for the full duration of the contract. The remuneration of the CLO shall be determined jointly by the contractor, engineer and employer.

c. Period of employment of the community liaison officer

The period of employment of the community liaison officer shall be as decided upon

i. jointly by the contractor, engineer and employer.

C3.1.16 Community Participation.

a. Purpose

In order to give effect to the need for participation and transparency in the process of appointing labour, the community should participate in the decision making process throughout the life of a project. This shall be achieved through structured engagement between those responsible for the delivery of the project and the community.

b. Structure and Composition

A Project Liaison Committee (PLC) may be formed from representatives of the Employer, the Engineer, the Contractor and the Community if the project is such that a specific community can be identified.

c. Procedures

i. The PLC deals with labour and SMME involvement on the project and shall meet at least once every month until such time as it is of the opinion that it could fulfil its tasks by meeting less frequently.

ii. The PLC shall make recommendations by consensus. If consensus can not be reached, the decision of the Employer will be final in cases that have no financial implications for the Contractor or where payment is to be made from PC items. Where the financial responsibility for the successful completion of the works rests with the Contractor, the Contractor's decision shall be final. In fulfilling its tasks, the PLC shall be guided by the relevant sections of this specification and the supplementary documents.

d. Tasks of the PLC

i. To assist with community liaison and resolution of disputes.

ii. To devise fair and transparent procedures that will assist the Contractor in the engagement of labour and the award of sub-contracts to SMME's.

iii. To advise on and monitor labour issues.

iv. To assist in resolving labour disputes.

e. Assistance to the PLC

i. The Employer may appoint a competent local person as a Community Liaison Officer to assist the Engineer and the Contractor in the day to day liaison with the communities directly affected by the project.

C3.1.17 Open Trenches

Trenches may not be left open during the builder's holidays and shall be safe guarded at all times from danger to the public. Safe trench-crossings shall be provided at all intersections with accesses to properties and with public roads and paths. The length of trench left open at any one time may be restricted by the Engineer, should he consider such restriction to be in the interest of public safety.

C3.1.18 Statutory Regulations

The statutory requirement of the Occupational Health and Safety Act, Act 85 of 1993 (referred to as the Act below), and all regulations promulgated there under as well as the other relevant acts must be adhered to by the Contractor, with specific reference to the safety of all employees and the public, irrespective of whether such employees are employed by the Contractor or by his subcontractors (including local subcontractors). The Contractor, in entering into this Contract, hereby agrees with the Employer in terms of Section 37(2) of 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 the Contractor and the Employer to ensure compliance by the Contractor with the provisions of the Act, namely:-

(a) 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;

(b) The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and regulations will be fully complied with; and

(c) The Contractor hereby accepts sole liability for such due compliance with the relevant duties, obligations and prohibitions imposed by the Act and regulations, and expressly absolves the Employer and the Engineer from being obliged to comply with any of the aforesaid duties, obligations and prohibitions in respect of the Works; and

(d) The Contractor shall be obliged to report forthwith to the Employer and the Engineer 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.

(e) The Contractor shall sign the agreement bound into Section C1.2 of this document.

The Contractor shall comply with all the conditions of the Record of Decision in terms of Section 22(3) of the Environmental Conservation Act, 1989.

A time-related and a fixed-charge item have been provided in Section 1 and Section 2 of the Schedule of Quantities. The contractor shall allow for all obligations imposed by the Environmental Management Plan including the appointment of an environmental manager/control officer.

C3.1.19 Safety

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

(a) The Principal Contractor must do a Risk Assessment and compile an OHS Plan to be evaluated and approved by the Safety Agent prior to commencement of Construction.

(b) The Contractor must ensure that regular safety meetings be held, and that the minutes of such meetings be kept in a Safety File, which must be available on site at all, times.

(c) Provide to its Employees on the site of the works, all safety materials, clothing and equipment necessary to ensure full compliance with the provisions of the Occupational health and Safety Act, 1993 (Act No 85 of 1993) as amended (hereinafter referred to as the Act) at all times, and shall institute appropriate and effective measures to ensure the proper usage of such safety materials, clothing and equipment at all times;

(d) Provide, install and maintain all barricades, safety signage and other measures to ensure the safety of workmen and all persons in, on and around the site, as well as the general public;

(e) Implement on the site of the works, such procedures and systems and keep all records as may be required, to ensure compliance with the requirements of the Act at all times;

(f) Implement all necessary measures to ensure compliance with the Act by all sub-contractors engaged by the Contractor and their employees engaged on the works;

(g) Full compliance with all other requirements pertaining to safety as may be specified in the Contract (Also refer to Notice to Tenderers).

The Employer and the Engineer shall be entitled, although not obliged, to make such inspections on the site as they shall deem appropriate, for the purpose of verifying the Contractor's compliance with the requirements of the Act.

For this purpose, the Contractor shall grant full access to the site of all parts of the site and shall co-operate fully in such inspections and shall make available for inspection all such documents and records as the Employer's and/or Engineer's representative may reasonably require. Where any such investigations reveal, or where it comes to the Engineer's attention that the Contractor is in any way in breach of the requirements of the Act or is failing to comply with the provisions of this clause, the Engineer shall, in accordance with the provisions of clause 5.11 of the Conditions of Contract, be entitled to suspend progress on the works or any part thereof until such time as the Contractor has demonstrated to the satisfaction of the Engineer, that such breach has been rectified.

The Contractor shall have no grounds for a claim against the Employer for extension of time and/or additional costs if the progress on the works or any part thereof is suspended by the Engineer in terms of this clause, and the Contractor shall remain fully liable in respect of the payment of penalties for late completion in accordance with the provisions of clause 5.13.1 of the Conditions of Contract should the Contractor fail to complete the Works on or before the specified due completion date in consequence of the suspension.

Persistent and repeated breach by the Contractor of the requirements of the Act and/or this clause shall constitute grounds for the Engineer to act in terms of subclause 9.2.1 of the Conditions of Contract and for the Employer to cancel the Contract in accordance with the further provisions of the said clause 9.2."

In addition to all above safety related requirements the Contractor shall take cognisance of the requirements of the Construction Regulations and OHS Specifications.

C3.1.20 Safety Officer

OHS must be provided.

The Contractor is required to ensure compliance with the Occupational Health and Safety Act (Act 85 of 1993) and its regulations, in particular the Construction Regulations 2014, to appoint a Health and Safety Officer for the works.

The safety officer shall have a sound knowledge of the Occupational health and Safety Act. He shall preferably have completed the Safety Management Training Course (SAMTRAC) presented by NOSA. He shall also be registered as a Construction Health and Safety office with SACPCMP. The Contractor shall submit details of the proposed personnel.

C3.1.21 Source of Material/Borrow pit

The contractor will be held responsible for locating legal, licenced and approved sources of all materials complying with the relevant minimum requirements to be used in this contract. No separate payment shall be made for this, as all costs related thereto shall be deemed to be covered by the tendered rates.

Where possible materials manufactured or produced locally shall be procured to promote local enterprise.

C3.1.22 Photographic Record

Prior to the commencement of the work, and during the contract period, a photographical record shall be made of all existing stands and structures to be affected by the construction activities and forwarded to the Engineer prior to the commencement of Works.

No provision has been made in the Schedule of Quantities for this item.

C3.1.23 Requirements for Practical Completion

A Practical Completion Certificate shall be issued to the Contractor by the Engineer once the plant has been commissioned and operated as per the Plant Operator's Manual provided by the Contractor. for a period of not less than one month. The required plant output and water quality must meet the Engineer's specification.

C3.2 Construction

C3.2.1 Works Specifications

The standard specifications on which this contract is based are the following SANS 1200 Standardized Specifications:

SANS 1200 A	Preliminary and General
SANS 1200 AB	Engineer's Office
SANS 1200 C	Site Clearance
SANS 1200 D	Earthworks
SANS 1200 DA	Earthworks (Pipe Trenches)
SANS 1200 G	Concrete (Structural)

SANS 1200 H	Structural Steel Work
SANS 1200 HA	Structural Steelwork (Sundry Items)
SANS 1200 L	Medium Pressure Pipelines
SANS 1200 LB	Bedding (pipes)
SANS 1200 M	(general)
SANS 1200 ME	Sub-base
SANS 1200 MF	Base

C3.2.2 The term “project specifications” appearing in any of the SANS 1200 standardised specifications must be replaced with the terms “scope of work”.

C3.2.3 References from, and variations and additions to the Standard Specifications and Particular Specifications are included in section C3.4.2.

C3.2.4 Variations and Additions to Standard and Particular Specifications

The following variations and additions to the Standard and Particular Specifications will be applicable to this Contract.

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

SANS 10396:2003:	Implementing Preferential Construction Procurement Policies using Targeted Procurement Procedures
SANS 1914-1 to 6 (2002):	Targeted Construction Procurement
SANS 1921-1 (2004):	Construction and Management Requirements for Works Contracts Part 1: General Engineering and Construction Works and where accommodation of traffic is involved.
SANS 1921-2 (2004):	Construction and Management Requirements for Works Contracts; Part 2: Accommodation of Traffic on Public Roads Occupied by the Contractor.

The following DWS specifications are also referred to in this document and the Contractor is advised to obtain them from the Department of Water and Sanitation in Pretoria.

DWS1110	Department of Water Affairs, "Standard Specification for construction of pipelines."
DWS1130	Department of Water Affairs, "Standard Specification for the manufacture and supply of steel pipes, specials and fittings for duties up to 4,6 MPa design pressure."
DWS1131	Department of Water Affairs, "Standard Specification for the lining and coating of steel pipes and specials."
DWS1160	Department of Water Affairs, "Standard Specification for design, manufacture, supply and installation of polyvinyl chloride (pvc)."
DWS1740	Department of Water Affairs, "Standard Specification for plumbing

DWS2510	Department of Water Affairs, "Standard Specification for the supply of valves."

The various documents listed in section C3.2.4 shall be treated as mutually explanatory. However, should any requirement of section C3.2.4 conflict with any requirement of the Standardised Specifications or with any requirement of the Particular Specifications, then the requirement of section C3.2.4 shall prevail.

C3.2.2 Plant and Materials

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

C3.2.3 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.

C3.2.4 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 the Engineer and / or the Municipality. No excavation work will commence unless a representative of the Municipality and/or the Engineer have 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 Bill of Quantities to cover the cost of such work if so ordered by the Engineer. Where a service is damaged because of the Contractors 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.

The same shall apply to all Communication (Telkom, MTN, Vodacom, CellC, Neotel etc.) services in the area.

- **Source of water supply**

The Contractor will be responsible for the costs of the connection to the municipal supply as well as the use of water for construction purposes. The Contractor’s attention is drawn to the fact that the potable water supply may be erratic in this area. Under no circumstances may potable water be used for construction, unless written permission is granted by the Engineer. The Contractor will be responsible at his own cost for all water that may be required for the purpose of construction of the Works and for human consumption.

- **Sources of power supply**

Electricity is available from the existing network on site, and 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 Engineer shall point out the position of the Contractors camp to the Contractor during the site inspection. The Contractor may assume that the site camp will be within 2 km of the site.

- **Location of borrow pits**

The Geotechnical Investigation has not any indicated borrow pits nearby. The Contractor will be responsible for locating the closest borrow pit.

The Contractor will be responsible to ensure that the material is suitable for use and conforms with the specification required for use. Furthermore, the Contractor shall submit for approval an application to the Employer for the use of the borrow pits. The Contractor shall be responsible for any charges relating to royalties etc.

- **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. Sanitary facilities shall be regularly services as needed and waste material delivered to approved treatment facility.

It is required that specific sanitary facilities be provided for the Engineer, and these facilities will not be shared with the Contractor. The facilities are, however, to be kept in a clean and hygienic condition by the contractor to the satisfaction of the Engineer. All sanitary facilities are to conform to the by-laws of the Local Authority.

- **Temporary offices**

The Contractor is required to provide x1 (one) furnished office space for the Engineers, the Contractors' offices shall also have adequate space and facilities for the holding of site meetings, and for the Engineer to perform administrative functions on an ad hoc basis.

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**

One name board 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.

C3.2.5 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.

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**

Construction does not take place within a built-up area; however 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 / land 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 / property (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 the 15 degrees from a right angle.

Furthermore, the Contractor will be responsible to acquire the consent of all relevant authorities within the area which may be affected due to blasting activities, the aforementioned activity will be subject to the Engineers approval and written instruction to proceed with the process of acquiring consent.

- **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 the Engineer's 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 have been certified / licensed 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, safety signage 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 acoustic signalling device and a reversing alarm;

i) 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.

C3.2.6 Permits and Wayleaves

The Contractor will be responsible for the application and maintenance of any permits and/ or wayleaves that may be required by the relevant regulatory authorities affected by the construction of the works. This includes any permits for gravel prospecting and extraction that shall be applied and obtained from the relevant authority for the purposes of securing borrow pits. Original permits and wayleaves shall be kept on site at all times during construction activities.

C3.3 Management

C3.3.1 Setting out of the works

Generally, the positions of the works have been fixed on the plans according to the existing stand boundaries. The Engineer is to approve all setting out prior to commencement of excavation.

C3.3.2 Excavation of works & safety

The contractor shall ensure that all excavation work is carried out under the supervision of a competent person who has 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 hall 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 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:

- adequately protected by a barrier or fence of at least one meter in height and as close to the excavation as is practicable; and
- provided with warning illuminates or any other clearly visible boundary indicators at night or when visibility is poor.

The Contractor shall cause warning signs to be positioned next to an excavation within which persons are working or carrying out inspections or tests.

C3.3.3 Inspection by Engineer

No stage of construction shall be proceeded with until the Engineer or the Engineer's 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.

C3.3.4 Employment of local labour

It is specifically required that the Contractor adhere and apply Labour Intensive Construction (LIC) principles as far as possible. In this instance the following procedures must be followed:

- All labour is to be sourced from the Local Municipal area - the Contractor may only import key personnel from elsewhere.
- The fixed rate for the appointment of local labour will be a minimum as specified by law and shall be payable by the Contractor on (at least) a fortnightly basis.
- The Contractor's attention is drawn to Annexure D: Bargaining Council for the Civil Engineering

Industry: Wage and Task Grade Collective Agreement published in Government Gazette No: 39294 on 16 October 2015.

- 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.

C3.3.5 Site Meetings

Monthly site 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.

C3.3.6 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.

C3.3.7 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

C3.3.8 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 totality 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 and/or the contractor’s retention moneys.

C3.3.9 Management of the Works

C3.3.9.1 Planning and Programming

The mechanical contractor shall compile and submit to the Engineer, within (2) two weeks, a method statement and bar chart showing the acquiring of materials, manufacturing, delivery, installation and commissioning program.

The Contractor is responsible for liaison and arrangements with the Engineer in connection with the finalisation and approval of the construction programme. The programme shall be in the form of a bar chart only, and shall clearly show the anticipated quantities, the production rates and value of work to be performed each month.

A network-based programme according to the precedence method shall also be provided showing the various activities and critical path in such detail as may be required by the Engineer. The programme shall be updated monthly in accordance with the actual progress made by the Contractor.

Failure to comply with these requirements will entitle the Engineer to use a programme based on his own assumptions for the purpose of evaluating claims for extension of time and/or additional payments.

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

C3.3.9.2 Sequence of the Works

Sequencing of the works shall be agreed to between the Contractor, the Engineer and the Client to prevent unnecessary lapses in the level of water treatment. Sequencing shall generally be determined by the planning and programming referred to above.

C3.3.10 Methods and Procedures

C3.3.10.1 Format of Communications

All communications regarding the contract shall be channelled through the Engineer or his duty authorised representative.

C3.3.10.2 Fabrications / Shop Drawings

The Contractor shall submit fabrication/shop drawings to the Engineer at the earliest possible time. The Contractor must allow five (5) working days for approval of the drawings by the Engineer. Only once the Engineer has approved, signed and returned the drawings may fabrication commence.

C3.3.10.3 Normal Working Hours

Normal working hours shall be between 07:00 and 17:00 on weekdays from Mondays to Fridays and between 07:00 and 13:00 on Saturdays, should the Contractor choose to work on Saturdays, excluding Public holidays.

C3.3.10.4 Interference with Municipal Staff and Operations

The Contractor shall ensure that none of his staff interfere in any way with any municipal staff member or their functions and duties. Any member of the Contractors staff found to be interfering with municipal staff or operations in any way shall be removed from the site and shall not be allowed to return.

C3.3.10.5 Access for Other Contractors

The Contractor shall provide reasonable access to other Contractors carrying out work on the site from time to time, as and when such access is required. The Contractor is entitled to request reasonable notification of at least 24 hrs before access by others is required.

C3.3.10.6 Giving Notice of Work to Be Covered Up

The Contractor shall give the Engineer reasonable time to accommodate examinations in his programme, in which case times for inspections can be agreed on. Requests for examination of work shall be made in the site request book 24 hrs before the examination is required.

If the Engineer attends with the purpose of examining any part or materials of the works at the time and date as agreed upon with the Contractor, and it is found that the works or materials are not yet ready for inspection, the Contractor shall be responsible for the costs of such a visit by the Engineer.

C3.3.10.7 Cost of Test Specimens and Tests

It is deemed that the Contractor has made provision in his tender for all such services and tests that are required from him. It is the duty of the Contractor to, at his own cost and by means of the necessary tests, prove to the Engineer that the works comply with specifications and regulations.

C3.3.11 Other Contractors on Site

A civil contractor is expected on site during the contract period and close co-operation between the mechanical and civil contractors shall be required to ensure neither delays the other. Given this scenario, the Contractor responsible for delaying any other contractor shall be liable for all costs associated with the delay.

Programming and liaison between contractors in this regard must be taken into account.

C3.3.12 Testing, Completion, Commissioning, and Correction of Defects

Refer to the relevant sections in Part C3: Scope of Works and the Particular Specifications as set out in C3.5.

C3.4 Health and Safety

C3.4.1 Health & Safety Issues

All work is to be carried out in accordance with the Occupational Health and Safety Act and Regulations (Act 85 of 1993) (a copy of which must be kept on site), the Explosive Material Act of (Act 26 of 1956), the Minerals Act of 1991, and the Factories Machinery and Building Work Act (No 22 of 1941).

The Contractor's notice is drawn to the stipulations of the Construction Regulations 2014, a regulation of the Health and Safety Act 1993 (Government Gazette No 10113 of 07 February 2014). The construction regulation will be applied vigorously on the project.

The Contractor to be appointed must have made provision for the cost of health and safety measures during the construction process. The contractor must have the necessary skills, competencies and resources to carry out the work safely. A proper Safety Plan is to be submitted by the Contractor and a copy thereof is to be made available to all applicable appointed labourers and permanent workers on this project.

Before starting work on site, the Contractor shall present to the Employer his Occupational Health and Safety Plan for approval. He shall also appoint a certified Health and Safety Officer in writing and give a copy of the letter of appointment to the Employer.

The Contractor is to ensure that the legal compliance for the Health and Safety issues are in place. Audits will be carried out to ensure that the Contractor is registered and in good standing with the Workmen's Compensation fund and that the Contractor has affected insurance indemnifying the Employer against penalties levied upon the Employer due to the acts of omissions of the Contractor in failing to comply with the provisions of the OHS regulations 2003. A compliance audit will also be carried out to ensure that the Contractor has appointed a full-time competent person in writing to deal with the issues of the OHS and that a risk assessment has been conducted and a copy of the Safety plan is on site before any work commences.

Operational audits will be carried out on the following important issues:

- That the Safety Plan is on site at all times;
- That the Contractor's Safety file is on site at all times;
- That the Safety Officer is on site at all times;
- That Safety meetings are conducted as per the Safety Plan;
- That employees are working under safe conditions;
- That the public is not placed in danger; and
- That there is no harm to the environment.

C3.4.2 Accommodation of traffic

It is expected of the Contractor to ensure that the free flow of traffic is possible throughout the construction period.

The Contractor is to provide all necessary barricades, signs and lighting in accordance with the stipulations of the South African Road Signs Traffic Manual, and the Protective Services of the Local Municipality. All work is to be to the satisfaction of the Engineer.

C3.4.3 Reporting of accidents

In addition to any statutory regulations, the Contractor shall, as soon as practicable, report to the Engineer every occurrence on the Works or the site causing damage to property of injury of death of persons. If required by the Engineer, the Contractor will submit a report in writing to the Engineer within 48 hours of such requirement setting out full details of the occurrence.

The Engineer shall have the right to make any enquiries either on the site or elsewhere as to the cause and results any such occurrence and *the* Contractor shall make available to the Engineer the necessary facilities for carrying out such enquiries.

C3.4.4 Protection of the public

The Contractor shall erect fences and employ sufficient security personnel to prevent unauthorised access to the site by members of the public. Notices prohibiting access to the site shall be clearly displayed at all access points.

The notices shall be in English and Zulu.

The Contractor shall at all times ensure that his operations do not endanger any member of the public.

As the area is adjacent to areas with public thoroughfare and civilians the Contractor shall take special precautions to prevent public access to any danger areas on the Works, e.g. by temporary barricades and/or fencing as well as access control.

C3.4.5 Barricades and lighting

All excavations and openings in walls and slabs into or through which a person may fall shall be securely barricaded at all times in accordance with the requirements of the applicable OH&S regulations.

C3.5 PROJECT SPECIFICATION

The Project Specification forms an integral part of the contract and supplements the standard specifications listed in Part C3.2 Construction under Item C3.2.1 Work Specifications. The Project Specification is made up of three portions as indicated here below.

General / Standard Specifications

This portion of the Project Specification contains general descriptions of the works, the site and the requirements to be met. The standard specifications have been written to cover all phases of work normally required and may cover items not applicable to this particular contract.

Amendments to General / Standard Specifications and Additional Specifications

This portion of the Project Specification contains relevant information pertaining to choices and alternatives provided for in the Standard Specifications i.e. choices of materials or construction methods. It also contains some additional specifications and amendments to the Standard Specifications required for this particular contract.

The number of each clause and each payment item in this portion of the Project Specifications consists of the prefix PS followed by a number corresponding to the number of the relevant clause or payment item in the Standard Specifications. The item number of any new clause or payment item (that does not form part of an existing clause or a payment item in the Standard Specifications) is also prefixed by “PS” followed by a new number. The new numbers follow on the last clause or item number used in the relevant section of the Standard Specifications.

Particular Specifications

This portion of the Project Specification contains particular specifications applicable only to this project and consists of the prefix P followed by alphabetical numbering.

Discrepancy between specifications

In the event of any discrepancy between a part or parts of the Standard- or Particular Specification and the Project Specification, the Project Specification shall take precedence. In the event of any discrepancy between the Specifications and the Drawings and / or the Bill of Quantities, the discrepancy shall be resolved by the Engineer before the execution of the work under the relevant item.

Numbering reference

Where, in the Bill of Quantities, an item from a particular section of the Standard Specifications is used in another section, the item number of the source section is retained but prefixed by the number of the section where the item is used, (e.g. Item 61.03 used in Sect. 22, will be 22/61.03 which means that the provisions of Section 61 in respect of that item remain valid although the item is used in Section 22). This applies to new items introduced in the Project Specifications for a specific section but used in another section.

DETAILS OF RELEVANT CIVIL ENGINEERING PROJECT SPECIFICATIONS

PS 2. CONSTRUCTION AND MANAGEMENT REQUIREMENTS 39
PSA PRELIMINARY AND GENERAL (SANS 1200A) 43
PSC SITE CLEARANCE (SANS 1200C) 61
PSD EARTHWORKS (SANS 1200 D) 61
PSDB EARTHWORKS (PIPE TRENCHES) 69
PSG CONCRETE STRUCTURAL (SANS 1200 G) 72
PSHA STRUCTURAL STEELWORK (Sundry Items) 87
PSL MEDIUM PRESSURE PIPELINES (SANS 1200 L) 90
PS LB : BEDDING (PIPES) 95

C3.5.1 GENERAL / STANDARD SPECIFICATIONS

PS 1. SITE CONDITIONS

PS 1.1 Location of Site

The project within Chief Albert Local Municipality (CALLM). CALLM is situated in the north-eastern part of Mpumalanga. The co-ordinates of the project area are taken at the Carolina Water Treatment Works are:

- 26° 5'39.79"S
- 30° 5'22.68"E

PS 1.2 Access to Site

The sites are accessible through the gravel road leading to Carolina Water Treatment Works from the Route (R38) at 26° 5'24.48"S; 30° 5'36.65"E turn-off. The sites are easily accessible as the route is located along a number of road reserves.

PS 1.3 Nature of Materials on Site

The water table may be relatively high during summer months and sufficient provision must be made for effective draining of all excavations. The in-situ material is composed of mainly clayey soils. No additional payments will be applicable to the above-mentioned other than the relevant items in the Schedule of Quantities.

PS 1.4 Excavatability and Contractors Liability

Tenderers shall be deemed to have fully satisfied themselves as to the geological, environmental and cultural resource conditions that pertain to the Site of the Works before submitting their tenders.

PS 2. CONSTRUCTION AND MANAGEMENT REQUIREMENTS

PS 2.1 General

The Contractor shall exercise due diligence and care in constructing the Works, in order to ensure that no damage is caused to public or private property or to the property of the Municipality and that danger to persons, fauna, flora and livestock are limited to the extent that is reasonably possible.

The Contractor shall indemnify the Municipality against any and all claims that may arise from his construction of the Works, as required by the Conditions of Contract. It is the responsibility of the tenderers to acquaint themselves of the geology and soil conditions of the site before submitting a tender.

PS 2.2 Drawings (Read with SANS 1921 – 1: 2004 clauses 4.1.7; 4.1.11 and 4.1.12)

The following reduced drawings which form part of the tender documents shall be “working drawings – not for construction” and will be used for tendering and pricing purposes only.

The following reduced (A3) drawings are enclosed herewith:

Please refer to the relevant Annexure for complete list and attached drawings.

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

Any information which the Contractor has control over and which is required by the Engineer to complete the drawings of record (As-built drawings) shall be made available to the Engineer before the Completion Certificate is issued.

Only written dimensions may be used. Dimensions are not to be scaled from drawings unless ordered by the Engineer. The Engineer will supply all figures / dimensions which are not shown on the drawings. The levels or dimensions given on the drawings are subject to confirmation on site.

Any destination names on road signs which may be indicated on the drawings are subject to confirmation by the Engineer before these signs are manufactured.

PS 2.3 Quality Assurance (QA) (Read with SANS 1921 – 1: 2004 Clause 4.4)

The Contractor will be solely responsible for the production of work that complies with the specifications to the satisfaction of the Engineer. To this end, it will be the full responsibility of the Contractor to institute an appropriate Quality Assurance (QA) System on site.

The Engineer will audit the Contractor's QA System on a regular basis to verify that adequate independent checks and tests are being carried out and to ensure that the Contractor's own control is sufficient to identify any possible quality problems, which could cause a delay or failure to the works. The Contractor shall ensure that efficient supervisory staff, the required transport, instruments, equipment and tools are available to control the quality of his own workmanship in accordance with his approved QA System. The Contractor must note that it is not the duty of the Engineer or the Engineer's Representative to act as foreman, site agent or surveyor.

PS 2.4 Site Establishment (Read with SANS 1921 - 1: 2004 Clause 4.14)

This contract is to be executed in an area surrounded by rural settlements and as such, safety will be paramount. Furthermore, all due courtesy must be exercised as far as local resources are concerned (labour and materials).

The Engineer will facilitate all communication with the target community through liaison with the Employer and the CLO.

PS 2.5 Management of the Environment (Read with SANS 1921 - 1: 2004 Clause 4.19)

Respect for the environment is an important aspect of this contract and the Contractor shall pay special attention to the following:

Natural Vegetation

Only those trees and shrubs directly affected by the works and such others as the Engineer may direct in writing shall be cut down and stumped. The natural vegetation, grassing and other plants shall not be disturbed other than in areas where it is essential for the execution of the work or where directed by the Engineer.

Fires

The Contractor shall comply with the statutory and local fire regulations. He shall also take all necessary precautions to prevent any fires. In the event of fire, the Contractor shall take active steps to limit and extinguish the fire and shall accept full responsibility for damages and claims resulting from such fires, which may have been caused by him or his employees.

Environmental Management Plan

In addition to the above, all requirements of the Environmental Management Plan (EMP) will be adhered to.

PS 2.6 Submit detail as-built drawings of existing services and adjustments to construction drawings

The Contractor will be responsible for the submission of all as-built information (drawings etc.) of all existing services intersecting pipeline trenches as well as any applicable adjustments to the construction drawings. The lump sum tendered shall include full compensation for all information in the possession of the Contractor as required above in order to complete the as-built drawings.

Any information in the possession of the Contractor, which is necessary for the Engineer's Representative to complete his/her as-built drawings must be submitted to the Engineer's Representative before a final payment certificate and a certificate of completion will be issued.

PS 2.7 Features Requiring Special Attention

PS 2.7.1 Built-up Areas

The Contractor's attention is drawn to the fact that the portions of the works may be constructed close to built-up areas. The Contractor shall exercise all necessary precautions and take all necessary steps to ensure the safety and convenience of the public. Where applicable, the Contractor shall provide access for traffic over and through the works and for residents to their places of abode, all as described in the Specifications. The Contractor in his programming must make allowance for delays resulting from the aforesaid.

The Contractor shall give residents a minimum of 48 hours written notice of his intent to close access to residential stands. No access to a residential stand shall be closed for a period longer than 48 hours.

PS 2.7.2 Local Products

The Contractor shall use materials manufactured within South Africa and SANS approved where applicable in his Works, provided that such materials conform in all respects to the relevant requirements contained in the Specifications.

PS 2.7.3 Status of Buildings and Structures

The Contractor shall give all residents or other parties owning a building or structure within an appropriate radius (not less than 100m) from any point of blasting, a minimum of 48 hours' notice in the format as approved by the Engineer and/or relevant authority of his intent to execute any blasting work. The Contractor shall note all aspects relevant to the condition of the affected buildings and/or structures prior to blasting and shall acquire the signature of the owners/occupants agreeing to such conditions.

Subsequent to blasting, both the Contractor and the owners/occupants shall sign a form confirming the condition of the buildings and/or structures. In the event of damage to existing buildings and/or structures as a result of blasting, remedial work shall be done to the satisfaction of the owners/occupants at the Contractor's expense. Compliance with this clause will not relieve the Contractor of any of his responsibilities in terms of the Contract.

PS 2.7.4 Care of the Site and Environment

At all times during construction of the works and upon completion thereof, the site of the works and its environment shall be kept and left in a clean and orderly condition. The Contractor shall store all materials and equipment for which he is responsible in an orderly manner and shall keep the site free from debris and obstructions.

Clearing, grubbing, excavation and spoiling of excess and waste materials may only take place in the positions and over the areas shown on the drawings or authorized in writing by the Engineer. The Contractor shall protect fauna and flora at all times and within other areas surrounding the Site of the Works, to the approval of the Engineer, the Municipality and the Employer.

In addition to the above, the following environmental mitigation measures shall be taken during construction of the Works:

a) The Contractor's vehicle and plant maintenance depot shall be provided with suitable and effective oil disposal facilities. Should an oil, diesel or petrol spillage occur, the Contractor shall remove all contaminated soil to an approved disposal site.

b) No bins containing organic solvents may be cleaned on Site, unless liquid waste disposal facilities are provided on Site for this purpose, all to the approval of the Engineer.

c) Dust suppression techniques should be applied during construction of the Works, especially after construction of the top structures has commenced. The Contractor shall water appropriate portions of the Site at suitable intervals as approved by the Engineer in order to achieve this objective.

Should personnel or sub-contractors of the Contractor not comply with the requirements for environmental protection that are set out above, this shall be considered sufficient cause for the Engineer to order the replacement on Site of such employees or sub-contractors.

PS 2.7.5 Control of Water

The Contractor shall at all times and in all respect be responsible for the handling of storm water from higher-laying areas above the works and for the handling of any sub-surface water especially in excavations for terraces and trenches that may affect the works and for the handling of all spoiled water when disconnecting existing water connections or valves. The contractor shall also take note of the draining and handling of waste water in an appropriate manner and disposal thereof at an approved treatment facility, no raw sewage effluent or waste water will be discharged in an unsafe manner that may negatively impact on the environment or public health and safety.

All payments to be made in this regard and all costs related thereto, shall be deemed to be included in the relevant items that are included in the Bill of Quantities.

C3.5.2 Amendments to General / Standard Specifications and Additional Specifications

PSA PRELIMINARY AND GENERAL (SANS 1200A)

PSA 1.1: SCOPE

Replace sub-clause 1.1 with the following:

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

PSA 2: INTERPRETATIONS

PSA 2.3: Definitions

(a) General
Add the following definitions:

General Conditions: The General Conditions of Contract specified for use with this Contract and the Special Conditions of Contract.

Specified: As specified in the Standardized Specifications, the Drawings or Project specifications.

(c) Measurement and Payment:

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

Fixed charge: A charge that is not subject to adjustment on account of variation in value of the Contract Amount or the Contract Time of Completion.

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

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

PSA 3: QUALITY OF MATERIALS
PSA 3.1 Add the following:

All materials used in this Contract shall be the official SANS mark where applicable.
All materials shall be new and of the best quality available unless otherwise specified.

PSA 3.3 Ordering of Materials

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

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

PSA 4: PLANT

PSA4.2 CONTRACTOR'S OFFICES, STORE S AND SERVICES (Clause 4.2)

Add the following:

a) The location of the Contractor's offices, stores and services on site shall be subject to approval by the Engineer.

b) The Contractor's office (boardroom) is to include an air-conditioned facility with furniture suitable for the use during site meetings, accommodating 15 persons.

c) The Contractor's designated site agent shall be in possession of a cellular telephone.

No additional payment is made for this service and shall be deemed to be included in the preliminary and general.

PSA 5: CONSTRUCTION
PSA 5.1: SURVEY

PSA 5.1.1: SETTING OUT OF WORKS

Substitute the first sentence of Clause 5.1.1 with the following. The engineer will provide information for setting out of the works.

Add the following:

The Contractor shall be responsible for the true and proper setting out of the Works from the basic control points shown on the Drawings or indicated by the Employer's Agent Representative on site and shall ensure the correct location of the Works in relation to such points. The Contractor has to ascertain himself of the correctness of the pegs and benchmarks in the field. Any discrepancy shall be immediately reported to the Employer's Agent Any costs arising from failure to do so, shall be the responsibility of the Contractor. The Employer's Agent may alter any part of the works to suit local conditions if necessary.

Setting out the Works will not be measured and paid for directly, and compensation for the works involved in setting out shall be deemed to be covered by the rates and prices tendered and paid for in the various items of works included under this Contract.

PSA 5.1.1 Services (Sub-clause 5.4)

All excavations to expose existing known services shall be excavated by hand in all materials by the contractor. Any existing service in the road reserve or municipal servitude that is damaged as a result of negligence by the contractor will be repaired by the contractor to the satisfaction of the Engineer at his own cost.

PSA 5.2 WATCHING, BARRICADING, LIGHTING AND TRAFFIC CROSSINGS

All open excavations shall be properly demarcated with reflective tape, barricading and any other requirements that the Local Authority has.

The Contractor shall make adequate provision for the supply of temporary warning signs, barriers drums etc to the satisfaction of the Engineer for the entire duration of the contract. Road and traffic signs shall comply with the requirements of the "South African Road Traffic Manual".

PSA 5.3 PROTECTION OF STRUCTURES

Add the following provision to clause 5.3:

The Contractor must contact house owners at least two weeks prior to working in close proximity to existing buildings and to inspect buildings before and after work had been completed.

The Contractor shall note all aspects relevant to the condition of the affected buildings and/or structures prior to blasting and shall acquire the signature of the owners/occupants agreeing to such conditions.

Subsequent to blasting, both the Contractor and the owners/occupants shall sign a form confirming the condition of the buildings and/or structures. In the event of damage to existing buildings and/or structures as a result of blasting, remedial work shall be done to the satisfaction of the owners/occupants at the Contractor's expense. Compliance with this clause will not relieve the Contractor of any of his responsibilities in terms of the Contract.

PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

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

PSA 5.4 LOCATION AND PROTECTION OF EXISTING SERVICES

PSA 5.4.1 Location of Existing Services

Before commencing with any work in an area, the Contractor shall ascertain the presence and actual position of all services which can reasonably be expected by an experienced and competent Contractor to be present on, under, over or within the Site.

Without in any way limiting his liability in terms of the Conditions of Contract in relation to damage to property and interference with services, the Contractor shall, in collaboration with the Engineer, obtain the most up-to-date plans as are available, showing the positions of services existing in the area where he intends to work. Neither the Employer nor the Engineer offers any warranty as to the accuracy or completeness of such plans and because services can often not be reliably located from plans, the Contractor shall ascertain the actual location of services depicted on such plans by means of careful inspection of the Site.

Thereafter, the Contractor shall, by the use of appropriate methodologies, carefully expose the services at such positions as are agreed to by the Engineer, for the purposes of verifying the exact location and position of the services. Where the exposure of existing services involves excavation to expose underground services, the further requirements of Sub Clauses 4.4 of GCC 2015 and 5.1.2.2 of SANS 1200 D (as amended) shall apply.

The aforesaid procedure shall also be followed in respect of services not shown on the plans, but which may reasonably be anticipated by an experienced Contractor to be present or potentially present on the site.

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

As soon as any service which has not been identified and located as described above is encountered on, under, over or within the site, it shall henceforth be deemed to be a known service and the aforesaid provisions pertaining to locating, verifying and recording its position on the balance of the

site shall apply. The Contractor shall notify the Engineer immediately when any such service is encountered or discovered on the Site.

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

(a) known services, anywhere along the entire lengths of their routes, as may reasonably be deduced from the actual locations at which their positions were verified as aforesaid, due cognizance being taken of such deviations in line and level which may reasonably be anticipated, and

(b) any other service which ought reasonably to have been a known service in accordance with the provisions of this clause.

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

No separate payment will be made to the Contractor in respect of any costs incurred in preparing and submitting to the Engineer the Drawings as aforesaid. These costs shall be deemed included in the Contractor's other tendered rates and prices included in the Contract.

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

PSA 5.4.2 Protection During Construction

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

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

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

PSA 5.4.3 Alterations and Repairs to Existing Services

Unless the contrary is clearly specified in the Contract or ordered by the Engineer, the Contractor shall not carry out alterations to existing services. When any such alterations become necessary, the Contractor shall promptly inform the Engineer, who will either make arrangements for such work to be executed by the owner of the service, or instruct the Contractor to make such arrangements himself.

Should damage occur to any existing services, the Contractor shall immediately inform the Engineer, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases, the Contractor shall take appropriate steps to minimize damage to and interruption of the service. No repairs of telecommunication cables or electric power lines and cables shall be attempted by the Contractor.

PSA 5.7 SAFETY

Add the following:

CONTRACTOR'S RESPONSIBILITIES

For this contract the Contractor will be the mandatory of the Employer (Client), as defined in the Act (OHSA 1993), which means that the Contractor has the status of employer in his own right in respect of the contract. The Contractor is therefore responsible for all the duties and obligations of an employer as set out in the Act (OHSA 1993) and the Construction Regulations 2014.

Before commencement of work under the contract, the Contractor shall enter into an agreement with the Employer (Client) to confirm his status as mandatory (Employer) for the contract under consideration.

The Contractor's attention is specifically drawn to the following Acts, and particularly to the relevant regulations under each Act, copies of which shall at all times be kept by him on the Site:

- The Factories, Machinery and Building Work Act (Act 22 of 1941)
- The Explosives Act (Act 26 of 1956)
- The Mines and Works Act (Act 27 of 1956)
- The Occupational Health and Safety Act (Act 85 of 1993)

The Contractor is also required to comply with the safety precautions set out in the following publications, copies of which shall also be kept by him on the Site:

- The Code of Practice relating to the safety of men in civil engineering inspection pits and small –diameter vertical shafts. (Transactions of the South African Institution of Civil Engineers, Vol. 2, No. 11, November 1960, obtaining from the Secretary, S.A. Institution of Civil Engineers, PO Box 93495, Yeoville, 2143).

The Contractor's duties and responsibilities are clearly set out in the Construction Regulations 2014 and are not repeated in detail but some important aspects are highlighted hereafter, without relieving the Contractor of any of his duties and responsibilities in terms of the Construction Regulations.

(a) Appointment of a Construction safety officer
(b) Instituting a Health and safety committee in terms of Sections 17 and 18 of the OHSA)

(c) Appointment of Health and safety representatives (in terms of Sections 17 and 18 of the Act)
(d) Confirming the Contractor's position in relation to the Employer (Client) (Regulation 4)
(e) The Principal Contractor and Contractor (Regulation 5)
(f) Supervision of construction work (Regulation 6)
(g) Risk assessment (Regulation 7)
(h) Fall protection (Regulation 8)
(i) Structures (Regulation 9)
(j) Formwork and support work (Regulation 10)
(k) Excavation work (Regulation 11)
(l) Demolition work (Regulation 12)
(m) Tunnelling (Regulation 13)
(n) Scaffolding (Regulation 14)
(o) Suspended platforms (Regulation 15)
(p) Boatswain's chairs (Regulation 16)
(q) Material Hoists (Regulation 17)
(r) Batch plants (Regulation 18)
(s) Explosive powered tools (Regulation 19)
(t) Cranes (Regulation 20)
(u) Construction vehicles and mobile plant (Regulation 21)
(v) Electrical installation and machinery on construction sites (Regulation 22)
(w) Use of temporary storage of flammable liquids on construction sites (Regulation 23)
(x) Water environments (Regulation 24)
(y) Housekeeping on Construction sites (Regulation 25)
(z) Stacking and storage on construction sites (Regulation 26)
(aa) Fire precautions on construction sites (Regulation 27)
(bb) Construction welfare facilities (Regulation 28)

i) The foregoing is a summary of parts of the Construction Regulations applicable to all construction projects.

ii) The Contractor, as employer for the execution of the contract, shall ensure that all provisions of the Construction Regulations applicable to the contract under consideration are complied with to the letter.

Should the Contractor fail to comply with the provisions of the Regulations 3 to 28 as listed in Regulation 30, he will be guilty of an offence and will be liable, upon conviction, to the fines or imprisonment as set out in Regulation 30.

1. The Contractor shall provide suitable and safe access by way of ladders, Sluice Gateways, etc. to all parts of the Works as may be required for construction purposes or for inspection by the Engineer or the authorised Inspectors in terms of the above-mentioned Acts.

2. All precautions shall be taken to protect workmen against falling material and/or objects and other dangers whilst they are carrying out their duties. Trenches shall in every way be made and kept safe for persons working therein.

3. All persons working, inspecting or supervising in places where falling material and/or objects could be encountered shall be provided by the Contractor with hard hats (which have not expired) of a type approved by the Inspector of Mines, the use of which shall be strictly enforced.

4. The Contractor shall provide a properly equipped first-aid box, which shall be accessible at all times.

5. Where adequate safety precautions are not being observed, the Engineer may order the Contractor to comply with minimum safety requirements at the latter's expense. Compliance with such order will not absolve the Contractor from any of his responsibilities and obligations under the Contract.

6. The Contractor shall display on a prominent place the following emergency information:

   i. Local Police: Telephone number
   ii. Local Ambulance: Telephone number
   iii. Local Fire Brigade: Telephone number
   iv. Nearest Doctor
   v. Name
   vi. Telephone number (office hours)
   vii. Telephone number (after hours)
   viii. Consulting room street address
   ix.

PSA 5.9 ACCOMMODATION OF TRAFFIC (New clause 5.9)

Temporary traffic signs shall be erected at all diversions.

The number and layout of the traffic signs shall comply with the Site Manual entitled "Safety at Roadwork's in Urban Areas", as published by the Department of Transport.

Traffic signs shall have a yellow background with either a red / black border.

PSA 5.10 SITE MEETINGS

The contractor will be required to attend site meetings, normally held fortnightly, to discuss general progress, quality of work, problems, claims, payments, etc.

PSA 6: TOLERANCES

PSA 6.2 General

Add new subclause 6.2:

No guarantee is given that the full specified tolerance will be available independently of each other, and the Contractor is cautioned that the liberal or full use of any one or more of the tolerances may deprive him of the full or any use of tolerances relating to other aspects of the work.

Except where the contrary is specified or then clearly not applicable all quantities for measurement and payment shall be determined from the "authorised" dimensions. These are specified dimensions or those shown on the Drawings or, if changed, as finally prescribed by the Engineers, without any allowances for the specified tolerances.

If the work is therefore constructed in accordance with the "authorised" dimensions plus or minus the tolerances allowed, quantities will be based on the "authorised dimensions regardless of the actual dimensions to which the work has been constructed.

When the work is not constructed in accordance with the "authorised" dimensions plus or minus the tolerances allowed, the Engineers may nevertheless, at his sole discretion, accept the work for payment. In such cases no payment shall be made for quantities of work or material in excess of those calculated for the "authorised" dimensions, and where the actual dimensions are less than the "authorised" dimensions minus the tolerance allowed quantities for payment shall be based on the actual dimensions as constructed.

PSA 7: TESTING

The onus rests on the Contractor to produce work, which conforms in quality and accuracy of detail to the requirements of the Specifications and Drawings and the Contractor must at his own expense, institute a quality control system and provide experienced engineers, foremen, surveyors, materials technicians and other technical staff, together with all instruments and equipment, to ensure adequate supervision and positive control of the works.

The cost of the all supervision and process control, including testing, so carried out by the Contractor, shall be deemed to be included in the rates tendered for the related items of work.

The Contractor's attention is drawn to the provisions of the various sections of the Specifications regarding the minimum frequency of the testing that will be required for process control. The Contractor shall at his own discretion increase the frequency where necessary to ensure adequate control.

The Contractor shall submit to the Employer's Agent the results of all relevant tests, measurements and levels indicating compliance with the specifications on completion of every part of the work for examination.

Should the results of any of these tests fall below the required standards as specified in the specifications, the cost of any additional tests required by the Employer's Agent will be to the account of the Contractor.

PSA 7.1.1 CHECKING

Add the following:

The Contractor shall be responsible for all control testing required on the project and costs thereof will be deemed to be included in the tendered rates. This clause covers any additional or control testing as may be required by the Engineer. Any such additional testing shall be undertaken by a nominated independent person /laboratory.

PSA 7.2 APPROVED LABORATORIES

Add the following:

A Laboratory for the use of the Engineer Representative is not required on site. A registered commercial laboratory approved by the Engineer and appointed by the Contractor shall do all acceptance control tests required in terms of the Contract. All tests must be done according to the tests prescribed in the SANS 1200 under the relevant sections.

PSA 7.4 STATISTICAL ANALYSIS OF CONTROL TESTS (SUB-CLAUSE 7.4)

Statistical control methods will not be applied under this contract

PSA 8: MEASUREMENT AND PAYMENT

PSA 8.1.2 PRELIMINARY AND GENERAL ITEM OR SECTION

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

The Contractors tendered sums under Items PSA 8.3 and PSA 8.4 shall collectively cover all charges for:

- Risks, costs and obligations in terms of the General Conditions of Contract and of this Standardized Specification, except to the extent that provision in made in these Project Specifications to cover compensation for any of these items of work;
- Head Office, site overheads, supervision, profit and financing costs;
- Expenses of a general nature not specifically related to any item or items of permanent or temporary work;
- Providing facilities on site for the Contractors personnel, including offices, storage facilities, workshops; ablutions, for providing services such as water, electricity, sanitation and rubbish disposal, for access roads and all other facilities required, as well as for the maintenance and removal on completion of the Works of the facilities and the cleaning-up of the camp site on completion of the Works; and
- Providing facilities for the Engineer and his staff as specified in SANS 1200 A (if applicable) and these Project Specifications.

PSA 8.2.1: FIXED-CHARGE AND VALUE-RELATED ITEMS (Sub-clauses 8.2.1. and 8.3)

The tendered sums for the fixed-charge and value related items in the P&G Section of the Schedule of Quantities shall not be subject to any variation if the actual value of the work done exceeds or falls short of the accepted tendered amount within the limit stated in Clause 6.3 of the General Conditions of Contract 2015, or if extension of time for the completion of the works is granted.

Payment for fixed-charged and value-related items will be done in three separate payments as follow:

40% of total cost after the Contractor has stabilised and equipped the site office and after the Employer’s Agent is satisfied that a substantial start of the actual construction work has been made;

40% of total cost after 50% of the actual work (excluding material on site) has been completed and approved by the Employer’s Agent;

20% of total cost on issue of practical completion certificate by Employer’s Agent, according to the guidelines of the GCC (2015).

PSA 8.2.2 TIME-RELATED ITEMS

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

Subject to the provisions of 8.2.3 and 8.2.4, payment under Item PSA 8.4.1 (time-related item) will be made monthly in equal amounts, calculated by dividing the sum tendered for the item by

the tendered contract period in months, provided always that the total of the monthly amounts so paid for the item is not more than in proportion to the progress of the Works as a whole.

Should the Engineer grant an extension of the time for completion of the Works, the Contractor will be entitled to an increase in the sum tendered for the time-related item, which increase shall be in the same proportion to the original tendered sum as the extension of time is to the original time for completion of the Works.

Payments for such increased amounts will be taken to be full compensation for all additional time-related Preliminary and General Costs that result from the circumstances pertaining to extension of time granted, provided always that the total of the monthly amounts so paid for the item is not more than in proportion to the progress of the Works as a whole.

If the works is completed before the end of the original time period allowed for completion of the works, the tendered amount of a time related item that is influenced by the earlier completion would be reduced similarly.

PSA 8.2.2.1: STANDING TIME COSTS DUE TO RIOT, ETC. FOR THE CONTRACTOR'S TOTAL OPERATION.

Unit: Sum per Working Day

The unit for measurement shall be a working day, and a working week shall be held to consist of five working days and a working day of 9 hours, unless otherwise agreed upon.

The sum per working day tendered under this time-related item shall represent that part of the Contractor's costs for standing time of whatever nature.

This payment item will only be applicable to delays in the execution of the Works and additional costs which in the opinion of the Employer’s Agent are incurred as a result of riot, commotion, politically motivated sabotage and acts of terrorism, or disorder outside the control of the Contractor.

The provision of this clause shall in no way prejudice the right of the Employer or the Contractor to terminate the Contract under the provisions of Clause 9 of the GCC (2015).

PSA 8.2.5 PRINCIPLES FOR SAFETY (NEW CLAUSE)

It is a condition of this contract that Contractors who submit tenders for this contract, shall make provision in their tenders for the cost of all health and safety measures during the construction process.

(a) Safety personnel

The Construction Supervisor, the Construction Safety Officer, Health and Safety Representatives, Health and Safety Committee and Competent Persons referred to in Clauses PSA 5.7 shall be members of the Contractor's personnel, and no additional payment will be made for the appointment of such safety personnel.

However, should it be necessary to appoint a dedicated Construction Safety Officer in terms of Clause PSA 5.7 on the instruction of the Inspector of the Department of Labour, as ordered by the Engineer, payment will be considered for such appointment.

b) Records and Registers,

The keeping of health and safety-related records and registers as described in PSA 5.7 is regarded as a normal duty of the Contractor for which no additional payment will be considered, and which is deemed to be included in the Contractor's tendered rates and prices.

PSA 8.3 SCHEDULED FIXED-CHARGE AND VALUE-RELATED ITEMS:

Replace the items with the following:

PSA 8.3.1: Contractor's Contractual Requirements……......Unit : Sum

The sums tendered shall include full compensation for all fixed preliminary and general charges as described in SANS 1200 A sub-clause 8.1.2.2 (c). Payment will be made as described in PSA 8.2.1

PSA-8.3.2 ESTABLISHMENT OF FACILITIES ON THE SITE

PSA 8.3.2.1 Facilities for Employer’s Agent

The Contractor to provide one furnished, airconditioned site office for the use of the Employer’s Agent and his representative sage to the requirements of SANS 1200 AB 3.2 or similar approved. A monthly time-related provisional sum has been included in the Schedule of Quantities to cover the rental costs of accommodation for the Employer’s Agent Representative. These amounts shall be payable by the Contractor to the Employer’s Agent according to the provisional sums allowed and upon receipt of a tax invoice for such amounts.

The Contractor shall provide and maintain two carports with waterproof roofing for the duration of the Contract for the use of the Employer’s Agent. The floor shall consist of crushed aggregate to alleviate dusty and muddy conditions or similar approved.

The Contractor shall further familiarise himself with the Covid-19 Health and Safey Specifications and ensure that the Employer’s Agent facilities is compliant with the Disaster Management Act: Regulations relating to Covid-19 and all amendments.

a) Cellular Telephone

No cellular telephone has to be provided for the Employer's Agent Representative for the duration of the contract. Measurement and payment shall only be made for the relevant time related item.

b) Name Board

Number of name boards as per Bill of Quantity will be ordered by the Contractor according to the Employer's Agent's specifications, complete with dimensions, wording and specifications as prescribed, within one month form the commencement date. The Contractor shall be responsible to transport the name board to site and to erect it at the indicated position on suitable supporting posts. The Contractor shall remove the name board completely from site after construction is completed before the last payment certificate shall be approved. The name board shall display the EPWP logo, indicating that this project if part of EPWP.

Add the following additional sub-item:

a) Furnished Air-Conditioned Engineers Office made Covid 19 Safe……..Unit:		Sum
b) Name board…… …….Unit		Sum
c) Photostatic Facilities to be able to print A3 and A4……Unit		Sum
d) Boardroom Made Covid19 safe (15 people) ……Unit		Sum
e) Ablution Facilities……..Unit		Sum
f) Parking Bays, 2 Vehicles……..Unit		Sum

The sum tendered shall cover all costs as specified in Sub-clause 8.3.2.3 of SANS 1200 A to provide the facility as specified in Clauses PSA 8.3.2.1

PSA 8.3.2.2 Facilities for Contractor: to comply with the Disaster Management Act, Covid 19 Regulations

Add the following additional sub-item:

a) Offices and storage sheds…….	Unit:	Sum
b) Workshops……...	Unit:	Sum
c) Change Rooms, Male and Female with Sanitisers……...	Unit:	Sum
d) Eating Area, Ventilated and Ensuring Social Distancing, with Sanitisers…….	Unit:	Sum
e) Laboratories…….	Unit:	Sum
f) Ablution and latrine facilities with Sanitisers……	Unit:	Sum
g) Tools and equipment……..	Unit:	Sum
h) Water supplies, electric power and communication.,……	Unit:	Sum
i) Dealing with water. (sub 5.5)……..	Unit:	Sum
j) Access. (sub-clause 5.8)…….	Unit:	Sum
k) Plant……..	Unit:	Sum
l) Laydown and piperack facilities…….	Unit	Sum

PSA 8.3.3 Cost of Survey in Terms of the Land Survey Act

Replace the items in 8.8.3 with the following:

The tendered rate shall cover all costs pertaining to setting out the works and for the provision of as-built survey data by the Contractor, showing coordinated locations and elevations for all items of construction. The Contractor will be responsible for the accuracy of the as-built survey data provided to the Engineering Representative. The as-built survey data is to be provided

electronically to the Engineering Representative in a format that has been approved by the Engineer.

Cost of Survey in Terms of the Land Survey Act ……. Unit: Sum

PSA 8.3.3 Public Notices and Warnings to Consumers

The Contractor shall ensure, as far as possible, uninterrupted water supply. However, should this not be the case and sections where connections are required to be isolated to perform the works, and water supply cannot be guaranteed, consumers should be notified via various channels. The rate shall cover the full compensation and cost of supply and delivery of the notices and warnings to customers as per the Employer's requirements at least 3-days before a planned shutdown. Typical channels include:

- The Employer's website;
- Printed media – Local Newspapers etc.;
- Radio; and
- Physical sign and posters at strategic public places such as clinics etc.

Issuing of notices to consumer for water interruptions etc…… Unit: No

PSA 8.3.8 Environmental Management Plan Obligations

The Contractor shall comply with the Environmental Management Plan requirements as compiled by the Environmental Compliance Officer. The Sum shall cover the cost of ensuring compliance with the EMP during Establishment and ensuring that all Specifications have been fulfilled.

Environmental Management Plan Obligation…… Unit: Sum

PSA 8.4 Time-Related Items:

The sum tendered shall include full compensation for all time-related preliminary and general charges as described in SANS 1200 sub-clause 8.1.2.2 (c). Payment will be made as described in PSA 8.2.2.

The Contractor shall tender a lump sum in the Schedule of Quantities to cover his time-related establishment costs. The amount tendered and paid shall be full compensation to the Contractor for:

(i) The maintenance of his whole organisation as established for this Contract.

(ii) The maintenance of all insurances, indemnities and guarantees required in terms of the Conditions of Contract or Tender where applicable.

(i) Compliance with all general conditions and requirements, which are not specifically, measured elsewhere for payment in these Contract Documents.

The Contractor shall tender a lump sum for the abovementioned items.

Payment of the lump sum shall be made monthly in compliance with the method laid down in Sub-clause 8.2.2 of SANS 1200:A.

The Contractor will not be paid Time-Related Preliminary and General charges for any Special Non-Working Days, as stipulated in the Appendix, which shall be deemed to have been allowed for in his rates.

Replace the items with the following:

PSA 8.4.1 Contractual Requirements……Unit: Sum

PSA 8.4.2 Operation and Maintenance of facilities on site for the duration of construction, except where otherwise stated

The tendered sums for the fixed-charge and value related items in the P&G Section of the Schedule of Quantities would not be subject to any variation if the actual value of the work done exceeds or falls short of the accepted tendered amount within the limit stated in Clause 6.11 of the General Conditions of Contract (2015).

PSA 8.4.2.1 Facilities for Employer's Agent

a) Maintaining air conditioned offices

The air conditioned office to be maintenance for the duration of the contract. Rate to include regular cleaning, maintenance of the air-conditioner as well as the office furniture where required .

Maintaining air conditioned office……Unit: Month

b) Maintaining printing facilities

The A4 & A3 colour printer and copier maintenance for the duration of the contract. Rate to include the purchasing of toner and the relevant printing paper as required for the printing of meeting material or any other project material required by the Employer's representative on site.

Maintaining printing facilities……Unit: Month

c) Accommodation for the Employer's Agent

These items will include the cost of rented accommodation to the Engineer. The Contractor will be responsible for this prime cost items to the amount as shown in the Bill of Quantities. These services will be provided to the Contractor by the Engineer and will be billed in advance. These items will include all overhead costs, maintenance and insurance with respect to the provision of accommodation facilities. This item shall be payable to the Engineer prior to certification of the second construction payment certificate.

Accommodation for the Employer's Agent……..Unit: Prov Sum

i. Overheads, charges and profit on item ……Unit: %

d) Cellphone and internet connectivity min 5Mb/s

No cellular telephone has to be provided for the duration of the contract. However, the contractor is responsible for costs up to R900.00/month all-inclusive.

Cellphone and internet connectivity min 5Mb/s……..Unit: Prov Sum

ii. Overheads, charges and profit on item ……Unit: %

e) Ablution Facilities

This item covers the cost of the maintenance of the Engineer's ablution facility. Cost should cover monthly servicing and maintenance for the duration of the contract.

Ablution Facilities……Unit: Month

f) SURVEY ASSISTANTS AND EQUIPMENT (Clause 5.5)

Substitute "two or more suitable educated survey labourers" in this paragraph with "one semi-skilled labourer".

The Engineer's Representative will occasionally need the assistance of a survey labourer to help with testing, survey, etc., envisaged at approximately 4 hours (non-consecutive) per week.

The Contractor shall provide the following tested and approved survey equipment on site for the duration of the contract and for the use of the Engineer whenever needed.

a) One automatic level plus tripod,
b) One level staff, all graduated metrically and
c)One 5m and one 25m-tape measure.

The above-mentioned equipment may, by arrangement be shared between the Contractor and the Engineer's Representative. The Contractor shall keep the equipment insured against any loss; damage or breakage and he shall indemnify the Engineer and the Employer against any claims in this regard.

PSAB 8.2.3 Survey Assistant (New Clause) ……hrs

Payment for the survey assistant shall be at the tendered day work rates for the hours worked in assisting the Engineer's Representative. No payment shall be made for the survey equipment all costs shall be deemed to be covered by the rates tendered for the Contractor's facilities. No payment shall be made for the survey equipment or survey assistant and all costs shall be deemed to be covered by the rates tendered for the Contractor's facilities.

g) Name Boards

Quantity of Name boards as specified in the approved Bill of Quantities shall be maintained for the duration of the Contract.

Name Boards……..Unit: Month

h) Health and Safety Inspections on Site

This item will include the provision of Health and Safety Inspections on Site by a certified Health & Safety Officer under the auspices of the Engineer. The Health and Safety Officer will ensure compliance of the Contractor with the OHS Act and he / she will have the authority to stop construction work in the event of non-compliance. The Contractor will be responsible for this prime cost item to the amount as shown in the Bill of Quantities. This service will be billed in advance and the item shall be payable to the Engineer prior to certification of the second construction payment certificate.

i) Environmental Management Plan Audits

This item will include the provision of Environmental Management Plan (EMP) Audits on Site by an Environmental Control Officer (ECO) under the auspices of the Engineer. The ECO will monitor compliance of the Contractor with the EMP. The Contractor will be responsible for this prime cost

item to the amount as shown in the Bill of Quantities. This service will be billed in advance and the item shall be payable to the Engineer prior to certification of the second construction payment certificate.

PSA 8.4.6 Additional Obligations

PSA 8.4.6.1 Security services costs……..…….....Unit: Month

The sum shall cover the full compensation and all costs for a sufficient 24 hour guarded services for the duration of the contract.

PSA 8.4.6.2 Monthly EMP Obligations ……...Unit: Month

The sum shall cover the full compensation and all time related costs for the duration of the contract, for the compliance with the Environmental Management Plan, and all the requirements stipulated in the plan.

PSA 8.4.6. Monthly OHS Obligations …….. Unit: Day

The sum shall cover the full compensation and all time related costs for the duration of the contract, for the compliance with the Occupational Health and Safety plan, and all the requirements stipulated in the plan.

PSA 8.5 SUMS STATED PROVISIONALLY BY THE EMPLOYER'S AGENT

The provisional sums provided for the cost of additional project specific requirements and legal compliance for the duration of the Contract. The sums shall only be expended as required and approved by the Engineer.

PSA 8.8 Temporary Works

PSA 8.8.2 Accommodation of Traffic…….….Unit: Lump Sum

Add the following to 8.8.2

The rate shall cover all costs pertaining to the provision, erection, moving, re-erection and maintenance of all temporary barricades, road signs, lights, flagmen, etc. as required for the guarding and protection of the Works as well as all other costs to accommodate the traffic during construction.

PSA 8.9 Construction Monitoring

Construction monitoring costs will be Monitoring Level 3 (Engaging Resident Engineer) and will:

a) Regularly visit the site at a frequency which may vary during the course of the project, and such visits may be daily or weekly according to the demand of the project;

b) Regularly, review samples of materials and work procedures for conformity to the contract documentation and design specifications. The RE shall review regular samples of important completed work prior to covering up, or on completion as appropriate.

c) The Contractor will take ultimate responsibility for quality of work and remains responsible to put in place quality control processes to control its output in terms of the design specifications and requirements whereas the design Engineer will conduct inspections and acceptance testing to confirm conformance to the design specifications prior to certification of the works.

PSA 9.1 SUBMIT DETAIL AS-BUILT DRAWINGS OF EXISTING SERVICES AND ADJUSTMENTS TO CONSTRUCTION DRAWINGS

The Contractor will be responsible for the submission of all as-built drawings of all existing services intersecting pipeline trenches as well as any applicable adjustments to the construction drawings. The lump sum tendered shall include full compensation for all information in the possession of the

contractor as required above in order to complete the as-built drawings must be submitted to the Engineer Representative before a certificate of completion will be issued for the works.

PSA 9.2 DETAILED SETTING OUT OF THE WORK

The Contractor will ensure that all the works be set out from existing survey beacons by a registered surveyor. The sum tendered shall be regarded as inclusive of all related survey work on site.

The Engineer will provide survey beacons (of adequate type and in sufficient quantity) as benchmarks. From information provided on drawings issued by the Engineer, the Contractor shall be responsible to provide all positions and levels, of all intermediate points required for proper control of the works.

As benchmarks may be disturbed during the execution of the works, all levels and setting out pegs shall be referred to at least two benchmarks. The Contractor will ensure that all works are set out from existing survey beacons by a professional registered land surveyor. The setting out data, including the elevation (obtain x, y, z coordinates) from these pegs shall be submitted to the Engineer for evaluation of final natural ground levels (NGL) prior to the commencement of excavations. In the case of deviation from the original pipe route for whatever reason, the contractor will at his own cost survey the new proposed route and submit the data to the Engineer for approval.

Preservation and replacement of beacons and pegs will be subject to the Land Survey Act, 1927 (Act No 9 of 1927).

PSA 9.3 COMPILE AND SUBMIT HEALTH AND SAFETY PLAN

The lump sum tendered shall include full compensation for the provision and maintenance of a Health and Safety Plan, risk assessment, permit applications and notifications as called for in the Act and Regulations.

Eighty percent (80%) of this amount will be paid when an approved Health and Safety Plan has been achieved. A further 10% will be paid when the value of work certified by the Engineer exceeds one half of the tender price and the remaining 10% will be payable upon issue of a completion certificate.

Compile and Submit Health and Safety Plan…….. Unit: Sum

PSA 9.4 IMPLEMENT HEALTH & SAFETY PLAN INCLUDING COVID-19 REQUIREMENTS

(Including the Construction Regulations 2014)…….Unit: Sum

The tendered sum shall include full compensation to the Contractor for compliance with all the requirements of the OHS Act and Regulations (including the Construction Regulations 2014) at all times for the full duration of the Contract inter alia of the following:

- Provision and maintenance of Health & Safety File;
- Provision of construction supervisors and safety officers;
- Health and Safety training for employees and subs;
- Provision of protective clothing;
- Provision of safety fences, signs and barricades; and
- Scheduling of monthly safety meetings and providing monthly reports accordingly, etc.

PSA 9.5 PROVISION OF REALISTIC CONSTRUCTION PROGRAMME

The lump sum tendered shall include full compensation for the compilation and submission of a realistic construction programme for approval by the Engineer:

- Within the stated period after appointment;
- Before commencement with any construction activities; and

- As and when so required / instructed by the Engineer.

Compile and submit for approval by Employer's Agent, a realistic construction programme within the stated period and before commencement of construction..... Unit: Sum

PSC SITE CLEARANCE (SANS 1200C)

PSC 3.1 Disposal of Material

Add the following:

"The Contractor shall obtain his own dumping sites for the disposal of material and all transport costs shall be included in the rates tendered for site clearance."

PS C 5 Construction

PS C 5.1 Areas to be Cleared and Grubbed

Substitute the first sentence of C 5.1 with the following:

Clearing and grubbing shall only be done in areas as instructed in writing by the Engineer. Clearing and grubbing of pipe and cable routes shall be limited to a 8 m wide strip. The Contractor may proceed with clearing and grubbing after hand-over of the site.

Substitute the last paragraph with the following:

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

PS C 5.2 Cutting of Trees

Trees outside the area to be excavated for the new structures must be left standing and undamaged, except when otherwise ordered, in writing, by the Engineer. A penalty of **R2000-00** per tree for trees damaged and/or removed will be charged.

PS C 5.9 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 strongly advised to make sketches and, where applicable, take photographs of existing fences before they are removed so as to avoid, as far as possible, arguments that may arise between himself and the property owner as to the quality of the re-erected fences.

PSC 8 MEASUREMENT AND PAYMENT

PSC 8.2.1 Clear and Grub

The removal of all rocks and boulders on site over 0,15m³ will be paid under sub-clause DB 8.3.2(b).

PSC 8.2.2 Take down existing fences

Add the following:

“The tendered rate shall also include for the re-erection of the fence to an equal or improved condition as prior to dismantling, photographing the fence prior to the removal or dismantling, and temporary fencing where required all as specified.”

The removal of existing fences and re-erection of these fences will be measured per linear meter.

PSD EARTHWORKS (SANS 1200 D)

PSD 2 INTERPRETATIONS

PSD 2.3 DEFINITIONS

Replace the definition for "Specified density" with the following:

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

Replace the definition for "stockpile" with the following:

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

Add the following definitions:

"**Commercial Source**: A source of material provided by the Contractor, and including any borrow pit, provided by the Contractor.

Fill: An embankment or terrace constructed of material obtained from excavations or borrow pits. In roads, it includes the earthworks up to the underside of the selected subgrade level.

Fill (material): Material used for the construction of an embankment or terrace.

Roadbed: The natural in situ material on which the fill, or in the absence of fill, the pavement layers, are constructed."

PSD 3 MATERIALS

PSD 3.1 CLASSIFICATION FOR EXCAVATION PURPOSES

PS D 3.3 Selection

PS D 3.3.1 General

Substitute the second paragraph of D 3.3.1 with the following:

The Contractor shall deal in such a way with materials from all excavations for structures and pipe trenches to ensure that usable material is not contaminated with unsuitable material. If usable material is contaminated, such contaminated material shall be removed and replaced with material of standard at least equal to the in situ usable material, all at the Contractor's expense. No additional payment shall be made in respect of this and all relevant costs shall be deemed to be included in the tendered rates.

Add the following to D 3:

PS D 3.4 Subsoil Drain under Structures

Where subsoil drainage is to be installed, subsoil drainage will be consisting of 110 mm diameter perforated or slotted uPVC pipes, or 100 mm diameter geo pipes in a bed of 19 mm stone, all as specified and shown in the drawings, shall be installed where shown on the drawings. The pipes shall be connected with approved couplings and a gradient as shown in the drawings, or of 1 in 200 must be maintained towards the discharge point.

PS D 3.4.1 Material for Subsoil Drainage

PS D 3.4.1.1 Pipes

Pipes for subsoil drainage shall be uPVC pipes complying with the requirements of SANS 791, but shall be perforated or slotted.

The size of perforations in perforated pipes shall in all cases be 8 mm in diameter ± 1,5 mm and the number of perforations per metre shall be not less than 26 for 110 mm pipes and 52 for 160 mm pipes. Perforations shall be spaced in two rows for 110 mm pipes and in three rows for 160 mm pipes.

Slotted pipes shall have a slot width of 8 mm ± 1,5 mm. The arrangement of slots shall be subject to the Engineer's approval, but the total slot area shall be not less than that presented for perforations.

Pipes without slots or perforations required for conveying ground water from the subsoil drainage proper to the point of discharge, shall be uPVC pipes as specified above.

PS D 3.4.2 Crushed Stone

Crushed stone in subsoil drains shall be 19 mm single-sized stone complying with the grading requirements of stone for concrete in SANS 1083.

PS D 3.4.3 Geo textile Blanket

The geo textile blanket around subsoil drains shall be a woven polypropylene tape similar and equal to Kaytech Bidim A2.

PS D 3.4.4 Sand

Sand in subsoil drains shall comply with the requirements of PS D 2.3.

PS D 4 Plant

Add the following to D 4:

PS D 4.5 Avoiding Quagmire Conditions

In order to prevent quagmire conditions occurring in the excavations, relatively static plant such as back-actors shall be used combined with hand trimming to complete the excavation to final level. Should the Contractor allow quagmire conditions to develop, he shall, at his own expense, take such steps to rectify the conditions as the Engineer may order.

PSD 5 CONSTRUCTION

PSD 5.1 PRECAUTIONS

PSD 5.1.1 SAFETY

PSD 5.1.1.1 Barricading and Lighting

Replace “Machinery and Occupational Safety Act, 1983 (Act 6 of 1983)” WITH “Occupational Health and Safety Act, 1993 (Act 85 of 1993)”.

PSD 5.1.1.2 Safeguarding of Excavations

Replace “Machinery and Occupational Safety Act” WITH “Occupational Health and Safety Act, 1993 (Act 85 of 1993)”.

PSD 5.1.2 Existing Services

PSD 5.1.2.2 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 SANS 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% Mod AASHTO density; and
b) In all other areas: 90% Mod AASHTO density.

PSD 5.1.2.3 Protection of cables

Replace sub-clause 5.1.2.3 with the following

PSD 5.1.2.3 Protection During Construction

Further to the requirements of Sub-clause 5.4.2 of SANS 1200A (as amended), major excavating equipment and other Plant shall not be operated dangerously close to Known Services.

Where necessary, excavation in close proximity to Known Services shall be carefully carried out with suitable hand tools, excluding picks wherever their use could damage the services. No additional payment will apply to such more difficult work.

Should any service not being a Known Service be discovered or encountered during the course of the Contract, the Contractor shall, in addition to complying with the requirements of Sub-clause 5.4.2 of SANS 1200A (as amended), immediately notify the Engineer thereof and implement such measures as will prevent damage of such service or, if it was damaged in the course of discovery, will prevent and minimise the occurrence of any further damage occurring.”

PSD 5.1.2.4 Negligence

Delete sub-clause 5.1.2.4.

PS D 5.1.4 NUISANCE

PS D 5.1.4.1 DUST NUISANCE

Add the following to D 5.1.4.1:

The Contractor is responsible for dust control and is liable for all claims that may always result from dust nuisance on all parts of the site and from the date of handing over of the site to the completion date of the contract. No payment regarding the above-mentioned will be made and all costs shall be deemed to be covered by the tendered rates.

PSD 5.2 METHODS AND PROCEDURES

PSD 5.2.2.1 Excavation for General Earthworks and for Structures

Add the following to paragraph (b):

"When the nature of the material precludes the above procedure, additional excavations shall be carried out to provide working space for the erection of formwork. In general, payment will be made for excavating a working width of 600 mm, but the Contractor may excavate a greater working width at no additional cost to the Employer."

Replace the first sentence of paragraph (e) with the following:

"Where excavations have been carried below the authorised levels, the Contractor shall backfill such excavations to the correct level with approved gravel compacted to 90% of modified AASHTO density or to the density of the surrounding material, whichever is the higher density.

Where excavations for structures have been carried out in hard material, the Engineer may direct that over-excavation be backfilled with weak concrete if there is a danger of settlement or differential settlement of the foundations.

Where the sides of excavations against which concrete is to be cast have been over-excavated or have collapsed partially, the Contractor shall re-trim the excavations if necessary and, unless other remedial measures are agreed to by the Engineer, shall cast the concrete for the structure, including the additional concrete that may be required as a result of the over-excavation or partial collapse. The cost of the additional concrete or remedial measures shall be for the Contractor's account."

PSD 5.2.2.3 Disposal

Replace the second sentence with the following:

“The Contractor shall, provide all necessary spoil sites for the spoiling of all surplus and unsuitable materials and shall make the necessary arrangements with the owner of the site where the material is disposed of, and pay all charges and levies as may be applicable for the use of such spoil sites. Transport costs shall be included.

Every spoil site provided by the Contractor shall be approved by the local authority in whose area it is located, and the spoiling shall comply with the applicable statutory and municipal regulations as well as the requirements of the owner of the spoil site.

PSD 5.2.2.4 Selection and Stockpiling

Approval or designation of the material in a particular borrow pit or excavation for a particular purpose does not imply that all the material in the borrow pit or excavation is suitable for the particular purpose for which the said approval or designation relates, nor that all material in the borrow pit or source should be used for the particular purpose. The Contractor shall select suitable material from that borrow pit or source, discard unsuitable material and reserve material for other purposes as necessary.

The Contractor shall organise and carry out its operations in such a manner as will prevent the contamination of suitable embankment and backfill material with unsuitable materials. Any excavated material which becomes, in the Engineer’s opinion, unsuitable for use in embankments or backfill as a result of contamination, shall be disposed of in a manner acceptable to the Engineer and shall be replaced by the Contractor with materials acceptable to the Engineer, all at the Contractor’s cost.

When required, or when ordered by the Engineer, material shall be stockpiled for later use.

PSD 5.2.2.5 Utilization of excavated material

All excavated material and material obtained from any temporary work shall, in so far it is suitable, be utilized for backfill of trenches or embankments where applicable. Material unsuitable for use as

backfill or in excess of the required quantity to complete the backfill shall be spoiled or utilized as directed by the Engineer. Excavated material may be stockpiled or used for temporary earth berms in order to control surface storm water or to prevent flooding of the construction site as applicable. However, any and all such temporary earthworks shall be removed, shaped, compacted, and treated etc. as specified and/or instructed by the Engineer on completion of the original Scope of Work.

PSD 5.2.2.6 Excavation limits for payment purposes

For measurement and payment purposes, the limits of the excavations for structures shall be as shown on the Drawings.

Where no excavation limits are shown on the Drawings and the Engineer has decided that formwork has to be provided for the sides of a concrete member, the limits of the excavation for measurement and payment purposes shall be the vertical planes 0,6 m outside the perimeter of the concrete member for which the formwork is to be provided, and the founding level shown on the Drawings.

PSD 5.2.2.8 Unsuitable material

Any and all boulders, clay, logs, roots or any other unsuitable material identified during excavation, shall be transported and spoiled. Clause PSD 5.2.2.3 shall apply.

Where, in the opinion of the Engineer, any unsuitable material is encountered at foundation level, such material shall be removed up to a level indicated by the Engineer and shall be replaced with suitable foundation fill or mass concrete as instructed or detailed, in accordance with the requirements of clause PSD 5.2.3.4 of this section.

PSD 5.2.2.9 Preparation of the founding surface

Where hard material suitable for founding is encountered at the founding level, it shall be cut and trimmed to a firm surface, either level, stepped or serrated, as may be required.

Where there are indications that the material at the founding level will be soft material or hard material that will deteriorate rapidly on exposure, the excavation of the final layer with a thickness of 150 mm shall be postponed until just before the blinding layer is placed.

Where ordered by the Engineer, excavations shall be extended to a specified depth below the given undersides of the slabs and footings to make provision for the placing of a concrete blinding layer.

PS D 5.2.3.1 Embankments

Add the following to D 5.2.3.1:

Embankments of ponds and terraces shall be constructed of approved material from excavations and shall be compacted to 95 % (100 % for sand) of MAASHTO density, in layers not exceeding 150 mm in depth. Compacted at an optimum moisture content.

PSD 5.2.3.3 Backfill and fill near structures

a) General

When placing backfill and fill, the following precautions shall be taken:

i. In so far as it is possible, the material shall be placed simultaneously to approximately the same elevation on both sides of a structure or structural member where appropriate. If conditions require that backfill or fill be placed appreciably higher on one side than on the opposite side, the additional material on the higher side shall not be place until authorized by the Engineer and preferably not until the concrete has been in place for 14 days, or until tests show that the concrete has attained sufficient strength to withstand any pressure safely that has been created by the backfill or fill or by the method of construction.

ii. The material behind structural members restrained at the top by the superstructure, e.g. portal-type structures shall be placed as stated on the Drawings or as directed by the Engineer.

iii. The material behind the walls of concrete culverts shall not be placed until the top slab has been placed and cured, unless otherwise authorized by the Engineer.

b) Backfill

Excavated areas around structures, between the structure and the vertical walls of the surrounding excavation, shall be backfilled with approved material in horizontal layers not exceeding 150 mm in depth after compaction, to the level of the original ground surface or to the level specified on the Drawings. Each layer shall be moistened or dried to the optimum moisture content for the material and be compacted to a density of not less than 90 % of modified AASHTO density, except that, in a road prism, the material shall be compacted to a density of not less than 93 % of modified AASHTO density. In cases where structures are founded on backfill material, the density shall be as specified in the Project Specifications but shall not be less than 95 % of modified AASHTO density.

c) Prevention of wedge action

Before the fill in the space between a structure and any adjacent sloping fill and the backfill between a structure and the sloping sides of the surrounding excavation is constructed, the slope of the fill and of the sides of the excavation shall be benched or serrated in order to prevent wedge action between the structure and the fill or the sides of the excavation during backfilling and compaction.

The distance between the exposed face of the structure and the toe of the fill of the excavation side shall be sufficient to allow proper compaction.

PSD 5.2.3.4 Foundation fill

If, during the course of excavation, it is found that the material at the indicated founding depth does not have the required bearing capacity, the excavations shall be extended at the discretion of the Engineer until satisfactory founding material is encountered. The Engineer reserves to himself the right to order the Contractor to make up the difference in levels with foundation fill.

Foundation fill consisting of granular material shall be constructed in layers not exceeding 150 mm in thickness after compaction. Each layer shall be moistened or dried to optimum moisture content for the material and be compacted to a density of not less than 95 % of modified AASHTO density.

Mass concrete fill to be used shall be of the class or mix specified or directed by the Engineer.

PS D 5.2.3.5 Filling under floors

Filling under the floors of buildings shall be done with sand from commercial sources, compacted to 100 % of MAASHTO density.

PS D 5.2.4 Finishing

PS D 5.2.4.1 Final grading

Add the following to D 5.2.4.1:

Terraces shall be trimmed to an even grade of 1 in 2.

PSD 5.2.5 Transport for Earthworks

Add the following new sub-clause in 5.2.5:

PSD 5.2.5.1 Free haul

Add the following new sub-clause in 5.2.5.1:

A Freehaul distance of 5,5km shall apply.

PSD 5.2.5.3 Special Cases Relating to

a) When material is excavated, and stockpiled on the Engineer's instructions before being reloaded and transported to its point of final use, free-haul shall apply twice, firstly from the point of

excavation to stockpile and secondly from stockpile to the point of final use

PSD 7 TESTING

PSD 7.2 TAKING AND TESTING OF SAMPLES

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

"The Contractor shall arrange with the approved independent laboratory engaged by the Contractor to carry out sufficient tests on a regular basis as agreed between it and the Engineer to determine whether the degree of compaction, and, where applicable, the quality of materials used, comply with the Specifications and shall submit the results of these tests to the Engineer in a form approved by him.

The compaction requirements for fills shall be deemed complied with when at least 75% of the dry-density tests on any lot show values equal to or above the specified density and when no single value is more than five percentage points below the specified value."

PS D 8 Measurements and Payment

PS D 8.1 Basic Principles

Add the following to D 8.1:

The rates for excavation shall also cover the cost of dealing with any stormwater or subsurface water, which may appear in the excavations.

PS D 8.3 Scheduled Items

PSD 8.3.1 Site Preparation

REPLACE SUB-CLAUSES 8.3.1.1 AND 8.3.1.2 WITH THE FOLLOWING:

"Where Site preparation such as clearing, grubbing, the removal of large trees or the removal and stockpiling of topsoil is required, the provisions and scheduled items of SABS 1200 C shall apply."

PSD 8.3.2 Bulk Excavation

Add the following sub items to D 8.3.2:

a) Extra-over 8.3.2(a) for soil cement backfilling where specifically required by the Engineer (percentage of cement indicated) Unit : m3

b) The tendered rate for sub item PS D 8.3.2(c) shall be additional to the rates tendered for D 8.3.2(a) and shall cover the cost of all incidentals required for the complete backfilling with soil cement as specified. The rate shall also include for the trimming and compacting of the excavation before placement of soilcrete.

b) Excavate and dispose of unsuitable material from excavation bottom Unit : m3

The rate shall cover the cost of complying with all the precautions required in terms of D 5.1 in addition to the cost of excavation of the additional depth in any material and the disposal of the unsuitable material as specified in PS D 5.2.2.3.

c) Extra-over 8.3.2(a) for trimming and compacting terraces Unit : m2

The rate includes for the trimming and compacting of horizontal and sloping sides of the terraces before top soil and grass is placed, including for the removal of large stones and rubble to form a uniform surface.

PSD 8.3.3 Restricted Excavation

Add the following sub items to D8.3.3

Restricted excavation shall be limited to those excavations detailed on the drawings or as agreed to by the Engineer as being restricted.

a) Extra-over 8.3.3(a) for soil cement backfilling

(percentage of cement indicated) ..... Unit : m^3

The tendered rate for sub-item PS D 8.3.3(c) shall be additional to the rates tendered for D 8.3.3(a) and shall cover the cost of all incidentals required for the complete backfilling with soil cement as specified. The rate shall also include for the trimming and compacting of the excavation before placement of soilcrete.

b) Excavate and dispose of unsuitable material from excavation bottom ..... Unit : m^3

The rate shall cover the cost of complying with all the precautions required in terms of D 5.1 in addition to the cost of excavation of the additional depth in any material and the disposal of the unsuitable material as specified in PS D 5.2.2.3.

c) Extra-over 8.3.3(a) for trimming and compacting terraces ..... Unit : m^2

The rate includes for the trimming and compacting of horizontal and sloping sides of the terraces before topsoil and grass is placed, including for the removal of large stones and building rubble to form a uniform surface.

PS D 8.3.5 Extra Excavation In All Materials To Provide Working Space Around Structures

Delete this sub clause and refer to sub clause PSD 5.2.2.4

PS D 8.3.8.1 Excavate by hand in soft material to expose existing service Unit : m3

Add the following to D 8.3.8.1(c):

Excavation by hand to expose existing services shall only be measured and paid for if so ordered in writing by the Engineer.

After the excavation of trial holes to determine the exact position and depth of existing services, at intervals as required by the Engineer, the excavation to a level of 300 mm above such services shall be measured and paid for as normal excavation, independent of the depth of such excavation. Only excavation within 300 mm of the existing services will be measured and paid for as excavation by hand and then only if ordered in writing by the Engineer. The rate shall also include the backfilling of the excavations and compaction thereof.

PSDB EARTHWORKS (PIPE TRENCHES)

PSDB 1: MATERIALS (Clause 3)

PSDB 1.1 CLASSES OF EXCAVATION (Sub-Clause 3.1)

The excavation of material, for the purposes of measurement and payment shall be classified as specified in PSDA 1.1

PSDB 2: CONSTRUCTION (Clause 5)

PSDB 2.1 SITE CLEARANCE (Sub-Clause 5.4)

Add the following to the clause:

"The Contractor shall dispose of all surplus and unsuitable material on a site to be found by him and approved by the Engineer. All costs related to the disposal of surplus material shall be deemed to be included in the tendered rates.

Where pipes are to be laid the Contractor will be allowed to clear and grub a strip 2,5m wide along the centre-line of the trench. No vegetation outside this strip may be damaged without the written approval of the Engineer.

All trees with a girth of 250 mm or a height of 2,5m within this strip, shall be protected and may only be trimmed or removed after a written order by the Engineer."

PSDB 2.2 BACKFILLING (Sub-Clause 5.6)

PSDB 2.2.1 DISPOSAL OF SOFT MATERIAL (Clause 5.6.3)

Add the following to the clause:

Surplus and/or unsuitable excavated material must be disposed of at a site found by the Contractor and approved by the Engineer.

PSDB 2.2.2 DISPOSAL OF INTERMEDIATE AND HARD ROCK MATERIAL (Clause 5.6.4)

Add the following to the clause:

Surplus and/or unsuitable excavated material must be disposed of at a site found by the Contractor and approved by the Engineer.

PSDB 3: TESTING (Clause 7)

PSDB 3.1 Notwithstanding the contents of Clause 7.1, the Contractor shall bear the cost of all quality control tests regardless of whether the tests indicate acceptable compaction or not.

The following are the minimum frequencies for the process control tests to be executed by the Contractor:

(a) Pipe bedding: one density test on each 10 m of pipe trench.

(b) Normal trench backfilling: one density test on every second layer for every 30 m of pipe trench.

(c) Backfilling in areas subject to vehicle loads one test on each layer of 150 mm at each crossing.

The positions of the minimum number of density tests shall be determined randomly by the Contractor and shall be clearly documented with the results. The results of the tests shall be submitted to the Engineer and shall prove to the Engineer that the work as a whole was done satisfactorily.

The Engineer could order additional tests, over and above the minimum tests. Payment for these tests will be made under Item PSA 8.5 if the tests indicate that the density is as specified. If any tests fail, the cost of such tests shall be for the account of the Contractor.

PSDB 8: MEASUREMENT AND PAYMENT

PSDB 8.1 BASIC PRINCIPLES

Disposal of surplus and/or unsuitable material will be as specified in PSDB 5.6.3 and PSDB 5.6.4. No additional payment other than the tendered scheduled rates will be made for such disposal of material.

PSDK 8.2.2 Gabions……..……unit: m^3
Separately items will be scheduled for gabions of galvanized wire and for gabions of PVC-Coated galvanized wire and for each size of box of mattress, each mesh size and each diaphragm spacing.
The volume will be calculated from the dimensions of the gabions as shown on the drawings or as ordered, irrespective of any deformation or bulging of gabions as constructed.
The rate shall cover the cost of the supply of stones, wire mesh cages, binders and connectors and the cost of loading, transporting, offloading, assembly and filling of the cages and completion of the construction of gabions.

PSDB 8.3 SCHEDULED ITEMS

PSDB 8.3.1 SITE CLEARANCE

Delete the limitation on the girth of trees. The rate for this item shall cover the cost of the removal of all trees, approved by the Engineer, and all obstructions to be expected.

PSDB 8.3.2 EXCAVATION

(a) Excavate in all materials for trenches, backfill, compact and dispose of surplus materials

Payment for pipeline excavation will be made in three instalments as follows:
50 % at completion of excavation, 30 % at completion of backfilling and the final 20 % after final approval which will take account of surface finishing, disposal of all unused material and approval and acceptance of all test results including the hydraulic testing of the pipe as specified.

(c) Excavate and dispose of unsuitable material from trench bottom

Unsuitable material shall be disposed of at a site approved by the Engineer.

PSDB 8.3.4 PARTICULAR ITEMS

a) Supply and install sack breakers in trenches exceeding 1:6 or 16.7% or where ordered by Engineer on site

b) Build cross embarkments where ordered by Engineer on site

c) Shore trench opposite structure, service or road

8 Measurement and payment

8.2.2 Gabions……unit: m^3
Separately items will be scheduled for gabions of galvanized wire and for gabions of PVC-Coated galvanized wire and for each size of box of mattress, each mesh size and each diaphragm spacing.

The volume will be calculated from the dimensions of the gabions as shown on the drawings or as ordered, irrespective of any deformation or bulging of gabions as constructed.
The rate shall cover the cost of the supply of stones, wire mesh cages, binders and connectors and the cost of loading, transporting, offloading, assembly and filling of the cages and completion of the construction of gabions.

The above particular items

PSG CONCRETE STRUCTURAL (SANS 1200 G)

PSG 2.3 Definitions

PSG 2.3(b) Quality

Recording of all quality control measures must be done on a daily basis in the Site Diary, information regarding batch number position in structure and date casted, must be specified.

PSG 2.3(c) Strength (sub-clause 2.3(c))

The required concrete strength will be the strength specified. Cube tests shall be done and no test result less than 95% of specified 28 days' concrete strength will be accepted. The maximum percentage of tests to fall below the specified level may be 5%.

PSG 3.2 CEMENT

PSG 3.2.1 Applicable Specifications

Substitute G 3.2.1 with the following:

Only Ordinary Portland Cement (OPC) and Pulverised Fuel Ash (P.F.A.) shall be used in all concrete for this Contract. No other types of cement (e.g. Rapid Hardening cement, PBFC or Milled Granulated Blast Furnace Slag) shall be permitted.

Pulverised Fuel Ash (PFA) shall comply with the following specifications:

a) PFA shall be obtained from only one Power Station, from which the PFA has been approved for used in concrete by the SABS.

b) All PFA shall comply with the requirements of SABS 1466.1988.

Pulverised Fuel Ash (PFA) shall be used as a partial replacement of the Ordinary Portland Cement (OPC) in concrete. The maximum percentage of mass of PFA shall be 33% of the total cementitious material in the concrete, which is defined as the total mass of OPC and PFA, and shall be mixed before the delivery to site.

The PFA/OPC Mix shall be stored in the same manner as that specified for OPC. When handled in bulk and stored in silos, the PFA/OPC mix shall require increased silo capacity, more efficient filters and aeration compared to OPC.

Portland cement that conforms to SANS 471, with minimum 42.5 MPa strength shall be used for all in-situ cast works.

PSG 3.2.3 Storage of Cement

Replace this Sub-Clause with the following Sub-Clause:

Cement which is stored on the Site shall be kept under a cover that provides adequate protection against moisture and other factors that may aggravate deterioration.

Where the cement is supplied in bags, the bags shall be closely and neatly stacked to a height not exceeding 12 bags, and they shall be so arranged that they can be used in the order in which they were delivered to the Site. Different brands and/or types of the same brand shall be stored separately.

The storage of cement in bulk in silos or similar containers shall be permitted, provided that the cement drawn for use is measured by mass and not by volume.

Cement shall not be kept in storage for longer than 6 weeks from the date of manufacture without the Engineer's permission. The Engineer may order the removal of cement, which is older than 6 weeks, from the Site or the alteration of the design mix if he does allow its use.

Alternatively, he may allow the cement to be used in concrete of less critical importance, as in blinding layers.

PS G 3.4 Aggregates

PS G 3.4.1 Applicable Specification

Substitute G 3.4.1 with the following:

Both coarse aggregate (stone) and fine aggregate (sand) shall comply with the requirements of SANS 1083, subject to the following:

a) The shrinkage of both the fine and the coarse aggregate, when tested in accordance with SANS Standard Method 5836, shall not exceed the following limits:

(i) For use in prestressed concrete, concrete bridge decks and slender columns, the shrinkage of both fine and coarse aggregate shall not exceed 130% of that of the reference aggregate.

(ii) For use in other reinforced concrete members, 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 concrete head walls and wing walls, the shrinkage of both the fine and the coarse aggregate shall not exceed 200% of that of the reference aggregate.

Where there is any doubt about the shrinkage characteristics of aggregates, the Contractor shall submit a certificate from an approved laboratory, indicating the shrinkage characteristics of the aggregate.

b) The flakiness index of the stone as determined by TMH1 Method B3 shall not exceed 35.

c) Aggregates shall not contain harmful amounts of organic materials such as grass, timber or similar materials.

d) Aggregates that may be potentially alkali reactive shall be assessed in accordance with SANS Standard Method 1245 and if there is a potential danger of any alkali aggregate reaction, the Engineer’s decision as to the suitability of the aggregate shall be final and binding.

e) Aggregates for concrete in contact with sewage or sewage gases shall be of dolomitic origin. All concrete for sewers and sewerage works except concrete for the following, shall therefore be made with aggregates of dolomitic origin:

- Blinding
- Mass concrete for foundation fill
- Concrete for encasing and bedding pipes

The quantity of insoluble matter in respect of concrete made with aggregates of dolomitic origin, determined according to the method described in SANS 677, Appendix C, shall not be more than 15%.

PSG 3.5 ADMIXTURES

PSG 3.5.1 Approval of Admixtures Required

Add the following paragraph to this Sub-Clause:

a) Admixtures shall comply with the requirements of ASTM C-154 or AASHTO M-154 and shall be of an approved brand or type.

PSG 3.5.2 Air-Entraining Agents

Add the following paragraph to this Sub-Clause:

b) Air-entraining agents shall comply with the requirements of ASTM C-260 or AASHTO M-194.

PSG 4 PLANT

PSG 4.5 Shuttering

PSG 4.5.1 Design

The shuttering must be designed and supplied by an approved supplier, in order to construct the new square, rectangular, circular, cylindrical and conical infrastructure easily and correctly, within specified tolerances. Concrete must be easily poured into and compacted in the erected shuttering, and must be tied and supported well, in order to be able to resist the dead weight of the wet concrete, compaction and shuttering as well as the effects of wind force. Shuttering may only be removed after approval of the Engineer.

PSG 4.5.2 Finish

Add the following to this Sub-Clause:

All external corners shall be chamfered by the fixing of fillet strips into the corners of the formwork to form 25 mm x 25 mm chamfers, all at no extra payment.

PSG 4.5.3 Ties

Add the following to this Sub-Clause:

Only patented ties shall be used on water-retaining structures. These ties shall be approved by the Engineer. Permanent metal ties shall have a minimum concrete cover of 40 mm after formwork has been removed. Tie holes shall be filled with an approved non-shrink epoxy grout.

The cost of supplying the special tie-rods as well as of filing the cavities left by the tie-rod cones shall be included in the rates tendered for formwork.

PSG 5 CONSTRUCTION

PSG 5.1.3 Cover

Add the following to this Sub-Clause:

Unless otherwise shown on the drawings, minimum cover to reinforcement shall be as for "severe" conditions (minimum cover shall not be less than 40mm).

PSG 5.2.1 Classification of Finishes

Add the following Sub-Clause 5.2.1

The following surface conditions are required on the various portions of the finished concrete:

(a) Rough
Concealed surfaces and surfaces more than 150 mm below final ground level.

(b) Smooth
All surface finishes not classified as "rough" in paragraph (a) shall be classified as "smooth". All exposed arises (i.e. where the angle between adjacent sides is 110° or less)

unless otherwise indicated on the drawings, shall be chamfered 20 mm x 20 mm by means of triangular fillets fixed to the formwork.

(c) Special smooth, repaired and rubbed

This shall be for formed surfaces of structures prominently exposed to public view where appearance is of special importance. Formwork shall only be of approved plywood, approved commercial form board or smooth tongue-and-groove boards, except that in certain cases such as for pre-cast unit's permission may be granted to use steel formwork provided that sufficient vibration is used. After defects have been repaired, as described in paragraph (e), all ridges, nail marks and other projections shall be removed with carborundum stone. After the treatment the surface shall then be kept continuously wet for 10 days after which period of additional curing it shall be allowed to approach surface dryness immediately prior to treatment by sack rubbing in order to secure a degree of suction most favourable for obtaining good bond. A soft mortar consisting of one-part cement and two parts sand passing the 1,18 mm sieve shall be thoroughly rubbed over the entire exposed surface with clean hessian, completely filling all pits and irregularities. The mortar consistency shall be that of thick cream. At a sufficient interval after the sack rubbing to prevent smearing, but before the mortar hardens, most of the excess mortar shall be removed by rubbing with clean hessian. After the mortar has set for several hours, curing shall be resumed and continued for at least two (2) days. The surface shall then be allowed to become surface dry and in this condition well sanded with no. 2 sandpaper.

(d) Exposed arises

All exposed arises (i.e. where the angle between adjacent sides is 110° or less) unless otherwise indicated on the drawings, shall be chamfered 20 mm x 20 mm by means of triangular fillets fixed to the formwork.

(e) Repair of concrete

Immediately after the removal of the formwork, the Engineer shall inspect the concrete for defects. Skilled workmen only shall perform all repairs of such defects, by approved methods and to the satisfaction of the Engineer and at the expense of the Contractor.

Repairs shall be carried out as soon as practicable after the removal of the formwork and in any case not longer than twenty-four (24) hours after exposure. Concrete that is damaged from any cause and concrete that is honeycombed, fractured or otherwise defective, and concrete which, because of excessive surface depressions must be excavated and built up to bring the surface to the prescribed lines, shall be removed and replaced with mortar or concrete as hereinafter specified or as otherwise directed by the Engineer.

Concrete filling generally of the same class as the damaged concrete shall be used for holes extending entirely through concrete sections and of such a size as will accept concrete and for holes in mass concrete greater in area than 0,1 m2 and deeper than 100 mm and for holes in reinforced concrete which are greater in area than 0,15 m2 and which extend beyond the reinforcing. Mortar filling composed of sand and cement in the same proportions as used for the concrete and of a consistency such as will make the mortar sufficiently plastic to be easily placed, shall be used for all other imperfections.

A filling shall be bonded tightly to the surface of the area being repaired and shall be bound and free from shrinkage, cracks and hollow areas after the filling has been cured and dried. Curing of repaired areas shall be performed in such a manner and for such periods as the Engineer may direct.

Particular care shall be exercised to ensure that the colour of the repair work shall match as nearly as possible to the colour of the surrounding concrete. No cement washing or plastering shall be carried out except on the written instruction of the Engineer.

The finish of the concrete shall be accurate to Degree of Accuracy as defined in terms of Clause 6 (see also 5.5.10.3).

PSG 5.2.2 Preparation of Formwork

Add the following to this Sub-Clause:

The joints between continuous formwork elements shall be closely butted and, where necessary, if undue leakage is expected, the joints shall be caulked, taped or packed with a sealing gasket, all at no extra payment. Paper, cloth or similar materials shall not be used for this purpose.

PS G 5.4 Pipes and Conduits

Add the following to G 5.4:

All pipes and specials, which must be installed in the floors and walls of structures, shall be embedded in the concrete during the casting of such concrete. No holes shall be left for the later installation of pipes and specials, without the written approval of the Engineer.

Where such holes have been approved by the Engineer, the Contractor shall be responsible for the grouting-in of such pipes or specials with an approved expansive cementitious grout as specified in PS G 4.5.3, regardless of whether or not these have been supplied by himself. The Contractor shall provide a smooth, dense and waterproof finish around the pipes or specials.

The clear space between pipes of any kind embedded in reinforced concrete and the clear space between such pipes and reinforcement shall at any point be not less than:

(a) 40 mm, or
(b) 5 mm plus the maximum size of coarse aggregate,

Whichever is the greater.

PSG 5.5 Concrete

PSG 5.5.1.2 Consistency

Add the following under Sub-Clause 5.5.1.2(a):

The slump for concrete to be used in water retaining structures shall not be less than 30 mm and not more than 60 mm.

PSG 5.5.1.3 Workability

Add the following to this Sub-Clause:

The concrete mix to be used in water retaining structures shall have a water/cement ratio not exceeding 0,5.

PSG 5.5.1.5 Durability

Add the following to this Sub-Clause:

All water retaining structures shall be deemed to be exposed to severe conditions. The water/cement ratio shall be determined by the strength of concrete specified but shall not exceed 0,5, in order to ensure workability, water reducing admixtures of approved manufactures shall be used in preference to increasing the cement content.

PSG 5.5.1.7 Strength concrete

Add the following to this Sub-Clause:

The concrete mix shall be designed by a specialist organization. No concrete shall be placed until the Contractor’s concrete mix design has been approved by the Engineer. The Contractor shall submit to the Engineer a statement of the mix proportion proposed, together with a report from the specialist organization, showing the 28-day concrete strength obtained when using the material

proposed for the work. The cost of the concrete mix design shall be borne by the Contractor and shall be deemed to be included in the rates for concrete work.

The grade of strength concrete and the maximum nominal size of coarse aggregate for each portion of the works, unless otherwise indicated on the drawings, shall be as follows:

i. Mass concrete under floors and foundations ..... 25 MPa/19 mm

ii. Blinding layers ..... 20 MPa/19 mm

iii. Encasing of pipes ..... 20 MPa/19 mm

iv. Strip foundations ..... 20 MPa/19 mm

v. Benching and screeds ..... 20 MPa/10 mm

vi. All Reinforced concrete ..... 35 MPa/19 mm

vii. All water retaining concrete ..... 35 MPa/19 mm

The concrete shall have a minimum cement: water ratio of 2,0 and shall have a minimum cement content of 320 kg/m3. Admixtures may be used to increase the workability of the concrete but only with express approval of the Engineer and when the details of the active ingredients of the admixture and their effects are supplied to the Engineer for approval before use. No additives likely to impair low permeability of the concrete will be approved. Calcium chloride or admixtures containing chlorides may not be used in concrete for water retaining structures. Other admixtures and constituents may only be used with the approval of, or as specified by the Engineer.

PS G 5.5.7 Construction Joints

Add the following to G 5.5.7.1:

Construction joints shall be limited to the minimum and shall only be made in positions as shown on the drawings or in positions as specifically approved by the Engineer. Construction joints between tank bottoms, floors, or wall bases, and the walls standing on them shall not be made flush with the supporting surface, but shall be made in the wall 150 mm above the base. The 150 mm high riser wall shall be cast as an integral part of the bottom, floor or base, i.e. the concrete in the riser shall be deposited simultaneously with the concrete in the bottom, floor or base adjacent to it. Where there is a fillet at the bottom of a wall, the construction joint shall be made 150 mm above the fillet.

A PVC water stop without centre bulb shall be installed at all construction joints in walls of water retaining structures. The size of the water stops shall be 150 mm in walls thinner than 200 mm and 200 mm in walls of 200 mm thickness and more, or as indicated on the drawings.

PS G 5.5.7.4 Expansion joints

Expansion joints shall be formed in positions and in accordance with details as shown on the drawings. All expansion joints shall be formed with an approved closed cell polyethylene fill material with a density of not less than 100 kg/m3, or as otherwise specified. Joint sealers shall consist of a two-component polyurethane sealing compound complying with SANS 1077. Rear-guard S-type PVC water stops with centre bulbs shall be installed under floors and Hydrofoil PVC water stops with centre bulbs in walls, as shown on the drawings.

All sealants fill material and water stops shall be installed strictly in accordance with the specification of the manufacturers and to the satisfaction of the Engineer. The sealant shall be installed in one operation and jointing to already hardened sealant will not be permitted.

PS G 5.5.9 Adverse Weather Conditions

Add the following to G 5.5.9.1:

No material having a temperature of below 5 °C shall be used for concrete, and no concrete shall be deposited when the ground or air temperature is below 2 °C. Furthermore, if the air or ground

temperature is likely to fall below 2 °C within 12 (twelve) hours after depositing of concrete, no concreting shall be done without the written consent of the Engineer. If such consent is given the Contractor shall heat the aggregate stockpiles and mixing water, and defrost the formwork and reinforcement.

PS G 5.5.10 Concrete Surfaces

Add the following to G 5.5.10.1:

Concrete surfaces under screeds, granolithic floor finishes or benching and surfaces of strip foundations and footings shall be brought up to a plane, uniform surface with a suitable screed board.

PSG 5.5.10.4 Wood-floated finish

Where wood floating is specified or scheduled, the surface shall first be given a finish as specified in G 5.5.10.1 and after the concrete has hardened sufficiently, it shall be floated to uniform surface free from trowel marks. The screeded surface shall be wood-floated, either by hand or machine, only sufficiently to produce a uniform surface from screed marks.

PSG 5.5.10.5 Steel-floated finish

Where steel floating is specified or scheduled, the surface shall be treated as specified in PSG 5.5.10.4 except that, when the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, the screeded surface shall be steel-trowelled under the firm pressure to produce a dense, smooth, uniform surface free from trowel marks.

PSG 5.5.11 Watertight Concrete

Add the following to this Sub-Clause:

All structures shall be deemed to be water retaining unless otherwise specified.

PS G 5.5.11.1 Requirements and tests for water tightness of structures

The completed structure shall be watertight, and the quality and finish of the work shall be such that no after-treatment of the work such as plastering or cement wash is necessary to ensure compliance with this requirement.

The works will not be certified complete until the structures enumerated in PS G 5.5.11 has been proved by testing to be watertight.

Upon completion of construction and when so agreed by the Engineer, the structure shall be filled by the gradual admission of water, not exceeding 2,0 m in 24 hours, until the water level reaches the designed maximum level. The water level shall then be carefully noted and recorded by the Engineer in relation to a fixed bench mark, and the structure shall be allowed to remain filled for a period of 2 (two) weeks or such longer time as may be required to permit complete saturation of the concrete. During this period, readings will be taken by the Engineer and the results so obtained will be available for the information of the Contractor.

At the end of this period more water shall be added, if necessary, to bring the water level back to the designed maximum level and the water shall be left undisturbed for a period of at least 4 (four) days during which time the level shall again be recorded by the Engineer at regular intervals. The structure shall be considered to be watertight if the drop-in water level does not exceed 6 mm in 96 (ninety-six) hours in the case of a roofed structure and if no leakage is apparent.

The acceptable drop in level in the case of an unroofed structure shall be such that it allows for normal evaporation during the time of the test.

The evaporation shall be measured by the mean drop in level caused by the evaporation of the water in three flat containers floating in the water, being recorded.

If appreciable leakage is evident at any stage of the filling or testing or if, in the opinion of the Engineer, the degree of water tightness is unsatisfactory, the Contractor shall, when so ordered by the Engineer, discontinue the test immediately and at his own expense take approved steps to rectify the work. The work of rectification shall be continued assiduously until, on repetition of the test procedure, a satisfactory test result is obtained and the degree of water tightness is acceptable.

Backfilling around structures shall not commence until a satisfactory test result has been obtained.

The Engineer shall have the right to retest the structure before the expiry of the defects liability period and the results of these tests will be made available to the Contractor. If these tests indicate to the Engineer that the degree of water tightness is unsatisfactory, the Engineer (before issuing the final certificate) will be entitled to order the Contractor to rectify the work at his own expense in such a manner as will cause least interruption of the water supply to consumers and will ensure that the degree of water tightness of the structure is satisfactory.

PSG 5.5.13 Grouting

Add the following to this Sub-Clause:

PSG 5.5.13.1 Materials

a) Water. Water for grout shall comply with the requirements given in Sub-Clause 3.3 of SANS 1200 G.

b) Aggregates. Notwithstanding the requirements of Sub-Clause 3.4.1 of SANS 1200 G, the grading of fine aggregate (sand) and coarse aggregate (stone or pea gravel) shall conform to the grading given in Tables 1 and 2, respectively, below.

c) Cement. Cement shall be ordinary Portland cement complying with SANS 471.

d) 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.

e) Proprietary grouting materials. Unless otherwise approved by the Engineer, proprietary grouting materials shall be obtained ready mixed in sealed pockets as supplied by the manufacturers.

TABLE 1 - SAND		**TABLE 2 - STONE OR PEA GRAVEL**	
1	**2**	**1**	**2**
Test sieve nominal aperture size, mm	% Passing (by mass)	Test sieve nominal aperture size, mm	% Passing (by mass)
9,75	100	9,5	100
4,75	95 - 100	4,74	95 - 100
1,18	45 - 65	2,36	0 - 5
0,3 (300 μm)	5 - 15		
0,15(150 μm)	0 - 5		

PSG 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:

1) 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.

2) 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.

3) 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.

b) The base shall be properly aligned and levelled and shall be maintained in that position during grouting.

c) After the machine or structural bedplate has been placed the following precautions shall be observed:

- Shimming shall be kept to a minimum. Steel plates shall be used for packing and shall be ground to the required thickness, where necessary.
- Before grouting starts 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 measures. The surface of the foundation slab shall be thoroughly saturated with clean water, and all excess water shall be removed from the surface and the bolt holes just before the grout is placed.
- Grouting shall not be carried out until the alignment of all units to be grouted has been checked and approved by the Engineer.
- Special care shall be taken with grouting in hot or cold weather to ensure proper setting and gain of strength and, in the case of proprietary grouting materials, by having ice or hot water available, as the case may be, in accordance with the instructions of the manufacturer. Enclosures shall be provided for the grout such that, until it has set, its temperature will be in the range 15-27°C.
- Shields to protect the grout from the sun and from hot winds shall be provided by the Contractor when so ordered.

PSG 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.

PSG 5.5.13.4 Mixing (all free-flowing grouts except epoxy grouts).

The grout shall be mixed to a homogeneous uniform mixture and delivered ready for placing at a temperature between 15°C and 25°C.

Substantial materials and water shall be mixed in a mortar mixer for at least 3 min. For the converse, mixing thoroughly by hand will suffice for smaller tasks, nonetheless the entire mass shall be turned over enough times to ensure even distribution of its components.

Mixing shall be done as close as possible to the place where the grout will be placed. No surplus grout shall be mixed at any one time than that which 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.

PSG 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 practical grout shall be placed from one side only and where this is not achievable, 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.

PSG 5.5.13.6 Dry-packed grout (standard dry sand and cement grout).

Dry-packed grout shall have a minimum compressive strength at 28 days of 25 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 between bedplate and foundation is 25 mm or less: 1 part of portland cement and 2 parts of sand;

b) where the clearance exceeds 25 mm: 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.

PSG 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 50 mm a sand-based mix shall be used. Where the clearance exceeds 50 mm the Engineer may order a mix with a base of sand plus pea gravel to be used.

PSG 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 25 mm, a sand-based mix shall be used. Where the clearance exceeds 25 mm the Engineer may order 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 9.4. Grout shall be placed within 45 minutes after the addition of the powdered aluminium.

The Contractor shall not use powdered aluminium additive when the ambient temperature is below 5°C.

PSG 5.5.13.9 Epoxy grout (epoxy mortar type only).

The manufacturer's instructions shall be observed when an epoxy grout is used.

PSG 5.5.13.10 Testing (Clause 7)

The Contractor shall, where so ordered, carry out a site test for each grouting procedure and each grouting Sluice Gate 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 m 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 to 7.2.3(f) SANS 1200 G.

PSG 5.5.16 NO-FINES CONCRETE

PSG 5.5.16.1 Materials

Cement, aggregate and water shall comply with the requirements of Clause 3 of this section. Each size of aggregate shall be a single-sized aggregate graded in accordance with SANS 1083.

PSG 5.5.16.2 Classes of no-fines concrete

No fines concrete shall be classified by the prefix NF and the size of the aggregate to be used. Class NF 20 means a no-fines concrete with a 19mm nominal size aggregate.

The volume of aggregate per 50 kg of cement for each class of no-fines concrete shall be as follows:

Class	Aggregate per 50 kg cement
NF 40	0,33 m^3
NF 20	0,30 m^3
NF 10	0,27 m^3

PSG 5.5.16.3 Batching and mixing

Cement shall be measured by mass or full bags of 50kg each and aggregate shall be measured by volume in approved measuring boxes or barrows.

The quantity of water added shall be just sufficient to form a smooth grout that will adhere to and completely coat each and every particle of aggregate and to be just wet enough to ensure that, at points of contact of the aggregate, the grout will run together to form a small fillet to bond the aggregate together. The mix shall contain no more than 20l of water per 50 kg of cement.

Mixing shall be carried out in an approved batch-type mechanical mixer, but small quantities may be hand mixed.

PSG 5.5.16.4 Placing

No-fines concrete shall be placed in accordance with the procedure agreed on by the Engineer. It shall be placed in its final position within 30 minutes of mixing.

The no-fines concrete shall be worked sufficiently to ensure that it completely fills 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 may the no-fines concrete be vibrated.

PSG 5.5.16.5 Protection

All no-fines concrete shall be protected from the elements and loss of moisture. Protection against loss of moisture shall be accomplished in one or more of the following ways:

a) Retaining formwork in place;

b) Covering exposed surfaces with sacking or other approved material kept continuously wet; and

c) Covering exposed surfaces with plastic sheeting.

No-fines concrete placed during cold weather shall be adequately protected against frost for at least 3 days.

PSG 5.5.18 Building in of Pipes

The Contractor under this Contract shall be responsible for building-in or caulking and making watertight around all pipes and fittings which pass through walls or under floors of the structures, irrespective of whether the Contractor himself supplies and installs the pipes and fittings, or the Employer purchases the pipes and fittings and the Contractor under this Contract takes delivery and installs them, or some other contractor (e.g. a plant supplier) supplies and installs the pipes and fittings in recesses or through holes left in the various structures for the reception of such pipes and fittings.

Where pipes or specials are required to pass through or be set into concrete work holes shall be left in the concrete.

Before commencing the positioning in holes of any pipes/specials the Contractor shall:

a) cut the reinforcement to allow the pipe to be installed;

b) remove all shuttering and boxing remaining in the holes;

c) make any alterations required to the position and shape of the holes;

d) thoroughly clean the sides of the holes so as to obtain a satisfactory bond surface for the new concrete; and

e) 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 12 mm 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. Alternatively, pipes may be cast into the wall in which case the pipes shall be installed in the required position with the formwork fixed around them and the concrete worked thoroughly into contact.

PSG 5.5.19 Foundations for Mechanical Equipment

The mechanical contractors shall supply the holding down bolts for all mechanical equipment, together with all dimensions and other details necessary for the construction of the pedestals and holding down bolt pockets, or the fixing of the bolts. The Contractor shall either form pockets for the holding down bolts to be installed at a later stage or he shall position the bolts before the concrete is cast as ordered by the Engineer. The mechanical contractor shall fix, align and level the mechanical equipment after which the Contractor shall grout up the units solidly by filling the voids inside and under the base plates as ordered with an approved non-shrink grout.

PS G 5.6 Screed in Clarifiers

No screeding of clarifier floors shall be allowed unless allowed by the Engineer. In this case, the contractor shall consult with the Mechanical Contractor, before application of the screed, to obtain advice on the use of the scraper mechanism for a smooth finish to the screed.

PS G 5.9 Hardening of Top of Clarifier Walls

When the walls of the clarifiers have become dry, but at least twenty-eight (28) days after its completion, the Contractor shall apply a chemical hardening and dust proofing compound, similar to Purigo 5S of Sika, to the top surface thereof. Three coats shall be applied, at a rate of one litre per 6 m^2 each.

PS G 5.10 Joining New Concrete to Existing

Where partial demolition is required for extension work to existing structures, the contact face shall be cut to predetermined line and level, and any loose and fragmented material shall be removed, and projecting steel cleaned and bent as directed by the Engineer. Where partial demolition is not required but extension work only, the contact surface shall be scabbled and cleaned of all dirt and loose particles.

If dowels are required, they shall be installed in holes drilled into the existing structure, in accordance with the details shown on the drawings, and secured by means of an approved type of epoxy bonding compound such as Epidermix 372 or similar.

Fresh concrete shall be bonded to the old concrete with an approved type of epoxy bonding compound, such as Epidermix 344 or similar.

PSG 6.3 CONCRETE ELEMENTS

Concrete elements shall be constructed and finished to the following tolerances:

1) surface irregularities: 5 mm
2) cross section dimensions: ± 5 mm
3) level: ± 5 mm
4) top of walls: 3 mm

PSG 6.6 FLOOR SURFACES

The flat and inclined floor slabs in the biological reactors and the sloping floor slabs in the cylindrical tanks (clarifiers etc.) shall be constructed and finished to the tolerances as specified under PSG 6.3 above.

In the case of the cylindrical tanks (clarifiers etc.) the scraper mechanisms for the tanks may be used for checking the tolerances but it shall be borne in mind that these mechanisms will only be installed towards the end of the contract. Under no circumstances shall the scraper mechanisms be used for sweeping the concrete to the required grade or thickness. When the mechanisms are used for checking the tolerances it must be done with the approval of the supplier of the mechanism. Grinding may be necessary to obtain the required tolerances of floor slabs in cylindrical tanks and the tenderer's attention is drawn to the various pay items that include for this treatment after installation of mechanical equipment.

PSG 8 MEASUREMENT AND PAYMENT

PSG 8.1.1 Formwork

Delete “or the plan size of the excavation where additional excavation is provided to facilitate erection of forms" in the first sentence of PS G 8.1.3.1(c). Delete the following in G 8.1.1.3(c) "and for different prop heights for beams and slabs".

PS G 8.1.3 Concrete

Delete “or the plan size of the excavation where additional excavation is provided to facilitate erection of forms” in the first sentence of PS G 8.1.3.1(c).

Add the following to PS G 8.1.3.1(d):

Strip foundations and encasement of pipes shall be cast directly against the sides and bottoms of excavations. No payment shall be made for additional concrete in over-break.

Delete the full stop at the end of G 8.1.3.3(a) and add the following:

"And special steps necessary before depositing concrete during cold weather, as prescribed in PS G 5.5.9".

PSG 8.1.1.6 Add the following to this Sub-Clause:

The unit rate shall also cover the cost of ties and patented ties as specified in Clause PSG 4.5.3.

PSG 8.5.9 BUILDING IN PIPES INTO CONCRETE OR MASONRY AND/OR GROUTING PIPES

Unit: number (No.)

The rate shall cover the cost of forming the opening for the pipe, scabbling, cleaning and preparing the concrete surface, providing an approved non-shrink epoxy grout, placing and ramming of it solidly into all voids, formwork and finishing to a smooth watertight surface.

PSHA STRUCTURAL STEELWORK (sundry items)

PSHA 2INTERPRETATION

PSHA 2.1 Supporting Specifications

c) SANS 1200 H

PSHA 3 MATERIALS

PSHA 3.1 STRUCTURAL STEEL

Replace the reference to BS 4360 with SANS 1431.

The grade of steel shall be S355JR (350W).

PSHA 3.3 BOLTS, NUTS AND WASHERS

PSHA 3.3.1 Bolts and Nuts (Other than Friction Grip)

Add the following to this Sub-Clause:

All bolts and nuts shall be of grade 4,6 steel. Washers shall be provided at each nut and shall be of the same material (or coating where applicable) to match the bolt and nut. Single coil square section spring washers shall be fitted to all nuts subject to vibration. Bolts other than jacking bolts shall project not less than 3 mm and not more than 10 mm from the heads of the nuts after tightening.

Holding down bolts to be built into concrete work as well as bolts to be installed above ground level directly above and under water shall all be of stainless steel grade 304. Bolts for flexible couplings and flanges for underground installation shall be hot-dip galvanized in accordance with the requirements of SANS 763. Bolts to be installed inside buildings shall be hot-dip galvanized in accordance with the requirements of SANS 763 and afterwards painted with the pipework and fittings as specified in the Standardized Corrosion and Painting Specification for Civil Engineering Works.

Suitable plastic sleeves and/or washers shall be used for protection against corrosion by metallic action.

PSHA 3.4 PAINTS AND PROTECTIVE COATINGS

Delete this Sub-Clause and refer to the Standardized Corrosion and Painting Specification in particular specifications PQ.

PS HA 5 CONSTRUCTION

PS HA 5.2 FABRICATION AND ASSEMBLY

PS HA 5.2.6 Handrails

SUBSTITUTE THE FIRST SENTENCE OF HA 5.2.6 WITH THE FOLLOWING:

Handrails shall be of the tube and sphere type similar to Monoweld and shall be manufactured by an approved firm specialising in such works from grade 304 L stainless steel or hot dipped galvanized (heavy duty coating), as scheduled or shown on the drawings.

Handrails shall be 1 000 mm high and shall consist of a handrail and a knee-rail, both manufactured of steel tubing of nominal thickness 2,6 mm and of nominal outside diameter of at least 34 mm.

Stanchions shall be manufactured pre-formed in one piece and shall be of steel tubing of nominal thickness of 2,6 mm and of nominal outside diameter of at least 42 mm. The bases of the stanchions shall be manufactured of 150 mm x 75 mm x 12,5 mm flat bars and shall be pre-formed to suit the situation in which they are to be installed (i.e. for platform- or side-mounting, and for horizontal- or sloped-mounting on concrete or steel), and the stanchion

spheres shall be pre-formed to suit right angled or other angled intersections), all as shown on the drawings.

Stanchions shall be spaced at intervals not exceeding 1,5 m and shall be fixed with two M16 bolts, washers and nuts each. All joints shall be welded.

Materials shall be as shown on the drawings or as scheduled.

PS HA 5.2.7 Ladders

ADD THE FOLLOWING TO HA 5.2.7:

Materials shall be as shown on the drawings or as per the following specification if not specified.

Ladders shall be of all welded construction. Materials used shall be as stated on the drawings and shall be manufactured in grade 304 stainless steel or hot dipped galvanized (heavy coating). Stainless steel shall be finished with a No. 1 surface finish. Pickling and passivation shall be carried out in accordance with the requirements of the Standardized Corrosion and Painting Specification for Civil Engineering Works.

Vertical ladders shall comprise stringers at 600 mm centres made of 32 mm nominal bore pipes with 3,56 mm wall thickness and rungs spaced at 300 mm centres made of 16 mm diameter solid round bars. The stringers shall be drilled on one side only to provide a sliding fit for the ends of the rungs which shall protrude through these holes up to the opposite inside face of the stringer and be welded all around where they enter the holes in the stringers.

Lugs for bolting ladders to walls shall consist of 20 mm nominal bore pipes with 2,87 mm wall thickness. Baseplates for stringers and lugs shall be 150 x 60 x 10 mm drilled for 2 No. M12 stainless steel bolts. Where safety cages are specified the hoops shall be made of 50 x 6 mm flat bars and the longitudinal of 40 x 6 mm flat bars, all in accordance with the dimensions as shown on the Drawings.

PS HA 5.2.8 Prefabricated Open Grid Floors

ADD THE FOLLOWING TO CLAUSE 5.2.8.1:

Open grid flooring shall be of square pattern type of approved manufacture with 40 x 4 mm minimum thickness bearer bars spaced at not more than 40 mm centers and shall be manufactured in grade 304 stainless steel or 3 CR 12 steel (as scheduled or as shown on the drawings). The tendered rate shall include for all cutting into the required panels, banding and for frames detailed below.

Open grid flooring shall be provided with welded frames as scheduled, made of 50 x 50 x 5 mm thick 3 CR 12 steel angles to provide a seating for the open grid flooring. The net clearance between the side bars of the open steel flooring and the vertical leg of the frame or strip shall be 5 mm per side. The frames shall be complete with 100 x 40 x 3 mm 3 CR 12 steel anchors fixed at 500 mm centers for building the frame into the concrete work.

Pickling and passivation shall be carried out in accordance with the requirements of the Standardized Corrosion and Painting Specification for Civil Engineering Works.

PSHA 5.2.11 Straps for pipes

Straps for holding down pipes to concrete surfaces shall be manufactured in the material stated on the drawing and to the dimensions as shown on the drawing.

If no dimensions are shown, same shall be 50 mm wide by 3 mm thick. The strap shall be slotted and shall be fixed to the concrete by means of M12 stainless steel self-drilling anchor bolts. The material between the strap and pipe shall be 8 mm thick neoprene sealing material 50 mm wide.

Pickling and passivation shall be carried out in accordance with the requirements of the Standardized Corrosion and Painting Specification for Civil Engineering Works.

PSHA 5.2.12 Access Covers

Access Covers shall be manufactured in grade 304 stainless steel or hot dipped galvanized (heavy coating), in accordance with the details as shown on the drawings.

The DWA manhole covers shall be manufactured as per drawing and shall comply with DWA standards. Access covers in open grid flooring shall be manufactured as shown on drawings.

Pickling and passivation shall be carried out in accordance with the requirements of the Standardized Corrosion and Painting Specification for Civil Engineering Works.

PS HA 8 MEASUREMENT AND PAYMENT

PS HA 8.3 SCHEDULED ITEMS

PS HA 8.3.2 Handrail assembly complete ..... ……..Unit : m

Delete the reference to “details given” and add: as specified in Sub-Clause PS HA 5.2.6 (state material to be used).

The tendered rate shall include handrails comprising hand and knee rails installed complete as specified.

PSHA 8.3.4 Flooring, complete and installed with frames ……..Unit: Square metre (m²)

Delete the reference to "details given" and add: as specified in Sub-Clause PSHA 5.2.8

(state material to be used).

PSL MEDIUM PRESSURE PIPELINES (SANS 1200 L)

PSL 2 INTERPRETATION

PSL 2.4 ABBREVIATIONS

Add the following to this Sub-Clause:

AC or FC - (Fibre reinforced cement)

HDPE – High-density polyethylene

PSL 3 MATERIAL

PSL 3.1 GENERAL

Add the following paragraph:

"Each type of pipe delivered to the Site shall have a standard length corresponding with the standard lengths offered by the pipe manufacturer in his catalogue, with a maximum permissible variation in length of ± 2%.

A pipe that is a shorter or longer than the defined standard will be rejected by the Engineer, except when such non-standard lengths are required in terms of the Contract and have been specifically manufactured or cut as such by the pipe manufacturer or supplier."

PSL 3.3 Cl PIPES, FITTINGS AND SPECIALS

Add the following to this Sub-Clause:

All cast iron pipes and fittings shall comply with the requirements of BS 2035 and unless otherwise specified, pressure class K9 and shall be of class D quality for straight pipes and of class CD quality for fittings. Materials used shall comply with the requirements of SANS 1034 grade 300 for "Grey Iron Castings".

PSL 3.7 Other types of pipes (Sub-Clause 3.7)

PSL 3.7.1 uPVC Water Pipes

Water pipes that have to be supplied shall be Class 16 uPVC spigot and socket or similar approved pipes unless otherwise specified, complying with SANS 996-1-2010 and diameters as set out in the Schedule of Quantities.

PSL 3.7.2 Galvanised Pipes

Galvanised steel pipes shall be supplied for inside isolation valve and bulk water meter boxes (diameters as indicated), unless otherwise indicated on drawings. Materials to be in accordance of SANS 62.

PSL 3.7.3 PVC-O

PVC-O pipes as specified in specification drawings and BOQ shall be supplied. Pipe material to be in accordance with SANS 16422.

PSL 3.8.3 Flanges and Accessories

Add the following to this sub clause:

The dimensions and drilling of standard flanges shall comply with the requirements of SANS 1123 table 16 for pipes and fittings with a diameter of 150 mm and smaller and in accordance with table 10 for diameters exceeding 150 mm unless stated otherwise. Flanges shall be machined flat, i.e. without a raised joint face. Puddle flanges shall have the same dimensions as standard flanges but shall be undrilled.

Faces of flanges which will be in contact with jointing gaskets shall receive a protective coating similar to the corrosion protection specified for the internal surface of the pipes and fittings of such thickness and consistency as will not impair the air/gas/water tightness of the joint.

The jointing gaskets shall comply with the requirements of BS 3063 and shall be cut to the full width of the flange and holed for bolts.

PSL 3.9 CORROSION PROTECTION

PS L 3.9.2.1 Steel pipes of nominal bore up to 150 mm

Add the following to L 3.9.2.1:

The requirements of PS L 3.9.2.2 shall apply mutatis mutandis.

PS L 3.9.2.2 Steel pipes of nominal bore over 150 mm

Add the following to L 3.9.2.2:

All mild steel pipes under this contract shall be treated in accordance with L 3.9.2.2(b)(2) on the inside and the outside, with a polyamide-cured epoxy system similar and equal to Copon EP 2300 or Amercoat 385. The Contractor shall furnish the Engineer with certificates of tests in accordance with L 7.4.

Substitute "250 μm" in L 3.9.2.2(b)(2) with "300 μm".

PSL 3.9.5 Joints, Bolts, Nuts and Washers

Add the following to this sub clause:

Bolts and nuts for standard flanges shall comply with the requirements of SANS 1123 for a working pressure as specified for the flanges in conjunction with which they are to be used.

The jointing gaskets shall comply with the requirements of BS 3063 and shall be cut to the full width of the flange and holed bolts.

All other bolts and nuts shall comply with the requirements of SANS 136 and shall be of grade 4,6 steel. Washers shall be provided at each nut and shall be of the same material (or coating where applicable) to match the bolt and nut.

Bolts shall project not less than 3 mm and not more than 10 mm from the heads of the nuts after tightening.

Bolts to be installed above ground level directly above and under water shall all be of stainless steel grade 304. Bolts for flexible couplings and flanges for underground installation shall be hot-dip galvanized in accordance with the requirements of SANS 763. All other bolts shall be hot-dip galvanized in accordance with the requirements of SANS 763 and afterwards painted with the pipework and fittings as specified in Clause 3.9.

Suitable plastic sleeves and/or washers shall be used for protection against corrosion by metallic action.

PSL 3.10.1 Gate Valves

All gate valves shall be standard waterworks pattern comply with the requirements of SANS 664 and shall be suitable for a working pressure of 2.5 MPa (Class 25) and 1.6 (Class) as specified. All gate valves must be supplied with a square spindle nut, suitable to be used with a valve key. One valve key per nut size must be provided and will be included in the rate for valves.

Gate valves shall be clockwise closing. The direction for opening and closing shall be permanently displayed on the valves. Valves shall have non-rising spindles.

Compression shut-off valves with rubber protected gate and smooth finish without recess inside, may be used. The body and bonnet shall be epoxy coated internally and externally.

The spindle seal shall consist of at least two O-rings located in a corrosion resistant housing. A wiper ring to prevent ingress of dirt shall be provided. The spindle nut may be loose or fixed in the gate.

The valves shall be provided with a straight, unobstructed body passage without any pocket and the gate shall be completely clear of the waterway in the fully open position. The sealing and gate guide areas shall be designed to eliminate deposits in the valve body. The gate guide areas shall be designed to eliminate deposits in the valve body. The gate guides shall be of substantial design to support the gate until the point of closure.

All components shall be interchangeable between valves of one size. The rated working pressure shall be 16 or 25 bar as specified. The valve shall be capable of being opened and closed under an unbalanced pressure equal to the rated working pressure.

All flanged gate valves shall be drilled according to SANS 1123 Table 1600/3 or 2500/3.

Pipes shall not be tested against a closed valve. Thrust blocks for test sections shall be approved by the Engineer prior to testing of pipes.

PSL 3.10.2 Air Valve

Air valve for potable water shall have a pressure rating as specified on the drawings. All air valves shall be double action air valves of Vent-o-mat RBX, or similar approved.

The branch of the tee on the main pipe shall be minimum 0.67 (2/3) of the diameter of the main pipe.

Double-acting air valves shall have large as well as small orifices. The large orifice shall have a rubber bed, and the small orifice a brass bed on which the balls can shut. Double-acting air valves shall be flanged and supplied with flanged isolating valves. Air valves shall be designed into remain open until all the air has escaped and shall not close due to the speed of the escaping air.

The valve shall incorporate an integral “Anti-Shock” orifice mechanism which, during the pipeline filling operation and when a separated water column proceeds to re-join, shall operate automatically to limit transient pressure, rise induced by large orifice closure to a maximum of 2 x valve rated working pressure

PSL 3.10.4 Reflux Valves (Non-Return)

Reflux valves shall have a class 16 pressure rating as specified and, unless otherwise indicated, shall be flanged, drilled to SANS 1123, Table 1600/3 or 2500/3. The casing and flap shall be manufactured from close-grained cast iron with a brass face on the flap that close onto a corresponding brass plane in the casing.

The hinge pin shall swivel freely in bearings on both sides of the casing. Cone-shaped rubber-seal reflux valves with stainless steel may be used if approved by the Engineer.

PSL 3.10.5 Bulk Water Meter

Mechanical Flow Meters

New Mechanical bulk water meters shall be installed as shown on drawings.

Functional Requirement of Bulk Water Meters

DESCRIPTION	METER
1. Detail of pipeline	Varies
2. End connections	Flanged, SANS 1123 (Class 1600/3)
3. Permanent flow rate	Varies m^3/h
4. Size of meter	Varies

Technical Requirements for the Meters

The bulk water meters shall be combination cold water meters (type C3200 by ABB, Kent or similar as approved by Engineer) and flanged on both sides. A distance of 5 times the diameter of the pipe before and 3 times the diameter after the water meter must be kept free of any obstructions such as bends, reducers, etc. unless it is approved by the Supplier that above conditions is not required, to be approved by Engineer.

The flow reading shall be given on a dial face and totalizing shall occur by means of a roller counter and shall be accurate within ± 2%. The body shall be manufactured from spheroidal graphite iron.

The meter shall be manufactured in such a way that all moving parts can be removed and replaced from the top without removing the whole meter. Replacement parts should be freely available. Each water meter installation shall be supplied with a gate valve on the upstream side of the water meter. This gate valve shall be provided for under the relevant item in the schedule of quantities. The water meter shall have provision to log the records manually and electronically (Data Logging).

Installation of Meter

The meter shall be installed by a person approved by the supplier in order to validate the guarantee.

All accessories for the complete installation shall be supplied by the Contractor.

All metal work shall be painted according to specifications after the testing and completion of the installation. Each meter must be supplied with a blind flange. The meter mechanism may only be installed after the pipeline has been completely constructed, flushed and tested.

Electromagnetic Flow Meters

New Electromagnetic bulk water meters shall be installed as shown on drawings.

Technical Requirements for the Meters

The bulk water meters shall be of the magnetic flow type cold water meters (Siemens / Khrone or similar as approved by Engineer) and flanged on both sides. A distance of 5 times the diameter of the pipe before and 3 times the diameter after the water meter must be kept free of any obstructions such as bends, reducers, etc. unless it is approved by the Supplier that above conditions is not required, to be approved by Engineer.

The flow reading shall be given on a digital transmitter face indicating the instantaneous flow and totalized volume and shall be accurate within ± 2%.

The meter shall be manufactured in such a way that all moving parts can be removed and replaced from the top without removing the whole meter. Replacement parts should be freely available. Each water meter installation shall be supplied with a gate valve on the upstream side of the water meter. This gate valve shall be provided for under the relevant item in the schedule of quantities. The water meter shall have provision to log the records manually and electronically (Data Logging).

Installation of Meter

The meter shall be installed by a person approved by the supplier in order to validate the guarantee.

All accessories for the complete installation shall be supplied by the Contractor.

All metal work shall be painted according to specifications after the testing and completion of the installation.

The meter mechanism may only be installed after the pipeline has been completely constructed, flushed and tested.

PSL 3.10.6 Control Valves

Surge Anticipating Valves shall open to a high and low pre-set pressure regardless of fluctuating demand or varying upstream pressure.

Level control valves shall be hydraulically controlled by modulating vertical float, diaphragm actuated control valve controlling reservoir filling to maintain a constant water level regardless of fluctuating demand.

Main Valves: The main valve shall be a centre guided, diaphragm actuated globe valve of either oblique (Y) or angle pattern design. The body shall have a replaceable, raised, stainless steel seat ring. The valve shall have an unobstructed flow path, with no stem guides, bearings, or supporting ribs. The body and cover shall be ductile iron. All external bolts, nuts, and studs shall be Duplex® coated. All valve components shall be accessible and serviceable without removing the valve from the pipeline.

Actuators: The actuator assembly shall be double chambered with an inherent separating partition between the lower surface of the diaphragm and the main valve. The entire actuator assembly (seal disk to top cover) shall be removable from the valve as an integral unit.

The stainless-steel valve shaft shall be centre guided by a bearing in the separating partition. The replaceable radial seal disk shall include a resilient seal and shall be capable of accepting a V-Port Throttling Plug by bolting.

Control System (Surge Anticipation): The control system shall consist of two 2-Way adjustable, direct acting, pressure reducing pilot valves, needle valves, isolating cock valves and filters. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested and factory adjusted to customer requirements.

Control System (level control): The control system shall consist of a 4-way adjustable, last position bi-level vertical float and sensing line (extended rod to be balanced by counterweights installed on the lever system according to rod length and system pressure and to be installed in a stilling basin), needle valves, isolating cock valves, and strainers. All fittings shall be forged brass or stainless steel. The assembled valve shall be hydraulically tested and factory adjusted to customer requirements.

Quality Assurance: The valve manufacturer shall be certified according to the ISO 9001 Quality Assurance Standard. The main valve shall be certified as a complete drinking water valve according to NSF, WRAS, and other recognized standards.

PS L 3.11 Manholes and Surface Boxes

PS L 3.11.4 Step Irons

Substitute L 3.11.4 with the following:

Step irons shall consist of polypropylene coated 12 mm high tensile steel such as Calamite or similar. The installation of the step irons shall be in accordance with the specification of the manufacturer.

PS L 4 Plant

PS L 4.3 Testing

Add the following to L 4.3:

The Contractor must ensure that the test equipment is in good working order and that it is calibrated.

PSL 5 CONSTRUCTION

PSL 5.1.4 Covering Required

The minimum covering measuring from the soffit of the pipe to the final prepared ground level shall not be less than 1000mm. Where applicable (Road Crossings etc.) the Engineer may order pipe enchasing to protect shallow pipelines.

PSL 5.6 VALVE AND HYDRANT CHAMBERS

PSL 5.6.1 General

Replace the words "drawing L-1" in the second line with “the Drawings”.

PSL 5.6.2 Construction of chambers

Replace the words "drawing L-1, L-2 and L-3" in the fourth line with "the Drawings".

PSL 5.11 MARKER BLOCKS

Marker blocks shall be manufactured and positioned as shown on the Drawings.

PSL 5.12 PIPELINE ROUTE MARKERS

Route markers for the various water pipelines shall be erected in the positions and shall be manufactured according to the details shown on the Drawings.

PSL 7 TESTING

PSL 7.3.1.2 Test Pressure

The test pressure shall be 1,5 times the maximum allowable working pressure for the class of pipe being tested.

PSL 8 MEASUREMENTS AND PAYMENT

PSL 8.2 SCHEDULED ITEMS

PS L 8.2.11 Anchor/Thrust Blocks and Pedestals Unit : m3

Substitute L 8.2.11 with the following:

The concrete shall be measured net volume to the specified width and depth in excess of the external volume of the pipe (i.e. the volume of the pipe will be deducted). The rate shall cover the cost of formwork and concrete.

Insert "concrete" before "and" in the last line of the last paragraph.

Add the following:

The tendered rates shall also include the wrapping of uPVC pipes and fittings with Densopol 80 or a similar approved material where the pipes and fittings come into contact with concrete."

PS LB : BEDDING (PIPES)

PS LB 1 SCOPE

Add the following to LB 1.1:

This specification also covers the bedding required for electric cables.

PS LB 3 MATERIALS

PS LB 3.1 SELECTED GRANULAR MATERIAL

Substitute LB 3.1 with the following:

Selected granular material shall be an aggregate, sand or granular material, all of a non-cohesive nature and free from any organic material, of which the grading analysis shows 100 % passing a 13,2 mm sieve and not more than 5 % passing a 0,075 mm sieve. In very

wet conditions and if so ordered by the Engineer, a non plastic crushed material with the specification as stated underneath should be used for bedding cradle.

a) Grading

Sieve size (mm)	% going through
19,0	100
13,2	84 - 100
9,5	70 - 84
4,75	45 - 65
2,36	29 - 47
1,18	19 - 33
0,600	13 - 25
0,300	10 - 18
0,150	6 - 13
0,075	4 - 10

b) Crusher value

The aggregate crushing value, calculated at minus 13,2 mm plus 0,5 mm fraction, may not exceed 29.

PS LB 3.2 Selected Fill Material

Substitute LB 3.2 with the following:

The requirements of PS LB 3.1 shall apply mutatis mutandis.

PS LB 3.3 BEDDING

Add the following to LB 3.3:

All pipes shall be classified as rigid pipes and shall be laid on a Class C bedding except water connections, which shall be classified as flexible pipes. Cable bedding is specified separately.

PS LB 3.4.1 Suitable Material Available From Trench Excavations

Substitute LB 3.4.1 with the following:

The provisos of PS D 3.3.1 shall apply mutatis mutandis.

PS LB 3.5 Bedding in Waterlogged Conditions

In waterlogged conditions, the Engineer may instruct the Contractor in writing to use a bedding cradle comprising single sized 6,7 mm crushed stone complying with SANS 1083.

PS LB 5 Construction

PS LB 5.1 General

PS LB 5.1.4 Compacting

Substitute "90 %" in LB 5.1.4 with "93 % (100 % for sand)".

PS LB 5.5 Placing and Bedding of Cables

Bedding and backfilling for cables shall be executed under this contract. Cables shall be installed by the mechanical contractor. Machine compaction shall not be carried out directly over cables, unless the cables are covered by at least 300 mm of fill material.

PS LB 8 Measurements and Payment

PS LB 8.1 Principles

PS LB 8.1.5 Disposal of Displaced Material

Add the following to LB 8.1.5:

The requirements of PS D 5.2.2.3 shall apply mutatis mutandis.

PS LB 8.2 Scheduled Items

Add the following to LB 8.2:

PS LB 8.2.6 Supply and Place Bedding Material for Cables, from

a) Trench excavations ..... Unit : m^3

b) Other excavations ..... Unit : m^3

c) Borrow pits ..... Unit : m^3

d) Commercial sources ..... Unit : m^3

Bedding and selected fill for cables shall not be measured separately.

No differentiation shall be made between trenches, bedding and backfilling for cables to be installed by the Contractor or the mechanical contractor.

The rate shall cover the cost of acquiring, regardless of the distance of bedding and selected fill material that complies with the requirement of PS LB 3.3, of delivering it to points alongside the trench spaced to suite the Contractor's methods of working, placing it in layers and compacting, as specified, and of disposing of displaced material. No additional payment will be made for co-operating with the mechanical contractor during the laying of cables and the cost related thereto shall be deemed to be included in the rate for supplying and placing the bedding material.

B OHSA 1993 HEALTH AND SAFETY SPECIFICATION

PB 1 SCOPE

This specification covers the health and safety requirements to be met by the Contractor to ensure a continued safe and healthy environment for all workers, employees and subcontractors under his control and for all other persons entering the site of works.

This specification shall be read with the Occupational Health and Safety Act (Act No 85 and amendment Act No 181) 1993, and the corresponding Construction Regulations 2003, and all other safety codes and specifications referred to in the said Construction Regulations.

In terms of the OHSA Agreement in Section C1.2.4 of the Contract document, the status of the Contractor as mandatory to the Employer (client) is that of an employer in his own right, responsible to comply with all provisions of OHSA 1993 and the Construction Regulations 2003.

This safety specification and the Contractor's own Safety Plan as well as the Construction Regulations 2003, shall be displayed on site or made available for inspection by all workers, employees, inspectors and any other persons entering the site of works.

The following are possible risks associated with this project:

- Children and other uneducated people playing or entering dangerous work areas and the need to take pro-active steps to inform residents of the dangers and the adequately protect the works. The ISD consultant will assist the Contractor in communicating these issues to the target community however the responsibility for ensuring that adequate steps are taken in this regard remains that of the Contractor;
- Work at heights including the danger of falling from a height (eg whilst erecting steel portal) or heavy objects falling from above;
- Steps are to be taken to warn local residents of the dangers relating to the work especially in so far as children are concerned. The Employer will make the services of an ISD consultant available to the Contractor;
- All workmen are to be given proper training in the safe use of their tools, the tools used by others on the Contract and the dangers associated therewith;
- Dangers associated with the handling and lifting of heavy items; and
- The Contractor's plant shall be left in a safe and managed environment when not in use.

Additional risks may arise from specific methods of construction selected by the Contractor which are not necessary covered in the above.

PB 2 DEFINITIONS

For the purpose of this contract the following shall apply:

Employer" where used in the contract documents and in this specification, means the Employer as defined in the General Conditions of Contract and it shall have the exact same meaning as "**client**" as defined in the Construction Regulations 2003. "**Employer**" and "**client**" is therefore interchangeable and shall be read in the context of the relevant document.

(a) "**Contractor**" wherever used in the contract documents and in this specification, shall have the same meaning as "**Contractor**" as defined in the General Conditions of Contract.

In this specification the terms "**principal contractor**" and "**contractor**" are replaced with "**Contractor**" and "**subcontractor**" respectively.

For the purpose of this contract the **Contractor** will, in terms of OHSA 1993, be the mandatory, without derogating from his status as an employer in his own right.

(b) "**Engineer**" where used in this specification, means the Engineer as defined in the

General Conditions of Contract. In terms of the Construction Regulations the Engineer may act as agent on behalf of the Employer (the client as defined in the Construction Regulations).

PB 3 TENDERS

The Contractor shall submit the following with his tender:

(a) A documented Health and Safety Plan as stipulated in Regulation 5 of the Construction Regulations. The Safety Plan must be based on the Construction Regulations 2003 and will be subject to approval by the Employer;

(b) A declaration to the effect that he has the competence and necessary resources to carry out the work safely in compliance with the Construction Regulations 2003;

(c) A declaration to the effect that he made provision in this tender for the cost of the health and safety measures envisaged in the Construction Regulations; and

(d) Failure to submit the foregoing with his tender, will lead to the conclusion that the Contractor will not be able to carry out the work under the contract safely in accordance with the Construction Regulations.

PB 4 NOTIFICATION OF COMMENCEMENT OF CONSTRUCTION WORK

After award of the contract, but before commencement of construction work, the Contractor shall, in terms of Regulation 3, notify the Provincial Director of the Department of Labour in writing if the following work is involved:

(a) The demolition of structures and dismantling of fixed plant of height of 3,0m or more;

(b) The use of explosives;

(a) Construction work that will exceed 30 days or 300 person-days;

(b) Excavation work deeper than 1,0m; or

(e) Working at a height greater than 3,0m above ground or landings

The notification must be done in the form of the pro forma included on page T.53 (Forms to be completed by Successful Tenderer) of the tender document.

A copy of the notification form must be kept on site, available for inspection by inspectors, Employer, Engineer, employees and persons on site.

PB 5 RISK ASSESSMENT

Before commencement of any construction work during the construction period, the Contractor shall have a risk assessment performed and recorded in writing by a competent person. (Refer Regulation 7 of the Construction Regulations 2003).

The risk assessment shall identify and evaluate the risks and hazards that may be expected during the execution of the work under the contract, and it shall include a documented plan of safe work procedures to mitigate, reduce or control the risks and hazards identified.

The risk assessment shall be available on site for inspection by inspectors, Employer, Engineer, subcontractors, employees, trade unions and health and safety committee members, and must be monitored and reviewed periodically by the Contractor.

PB 6 APPOINTMENT OF EMPLOYEES AND SUBCONTRACTORS

PB 6.1 Health and Safety plan

The Contractor shall appoint his employees and any subcontractors to be employed on the contract, in writing, and he shall provide them with a copy of his documented Health and Safety Plan, or relevant sections thereof. The Contractor shall ensure that all subcontractors and employees are committed to the implementation of his Safety Plan.

PB 6.2 Health and safety induction training

The Contractor shall ensure that all employees under his control, including subcontractors and their employees, undergo a health and safety induction training course by a competent person before commencement of construction work.

No visitor or other person shall be allowed or permitted to enter the site of the works unless such person has undergone health and safety training pertaining to hazards prevalent on site.

The Contractor shall ensure that every employee on site shall at all times be in possession of proof of the health and safety induction training issued by a competent person prior to commencement of construction work.

PB 7 APPOINTMENT OF SAFETY PERSONNEL

PB 7.1 Construction Supervisor

The Contractor shall appoint a full-time Construction Supervisor with the duty of supervising the performance of the construction work.

He may also have to appoint one or more competent employees to assist the construction supervisor where justified by the scope and complexity of the works.

PB 7.2 Construction safety officer

Taking into consideration the size of the project and the hazards or dangers that can be expected, the Contractor shall appoint in writing a full-time or part-time **Construction Safety Officer** if so decided by the Inspector of the Department of Labour. The Safety Officer shall have the necessary competence and resources to perform his duties diligently.

Provision shall be made by the Contractor in his rates, to cover the cost of this dedicated construction safety officer appointed after award of the contract.

PB 7.3 Health and safety representatives

In terms of **Section 17 and 18 of the Act (OHSA 1993)** the Contractor, being the employer in terms of the Act for the execution of the contract, shall appoint a **health and safety representative** whenever he has more than 20 employees in his employment on the site of the works. The health and safety representative must be selected from employees who are employed in a full-time capacity at a specific workplace.

The number of health and safety representatives for a workplace shall be at least one for every 100 employees.

The function of health and safety representative(s) will be to review the effectiveness of health and safety measures, to identify potential hazards and major incidents, to examine causes of incidents (in collaboration with his employer, the Contractor), to investigate complaints by employees relating to health and safety at work, to make representations to the employer (Contractor) or inspector on general matters affecting the health and safety of employees, to inspect the workplace, plant, machinery etc. on a regular base, to participate in consultations with inspectors and to attend meetings of the health and safety committee.

PB 7.4 Health and Safety Committee

In terms of Sections 17 and 18 of the Act (OHSA 1993) the Contractor (as employer), shall establish one or more health and safety committee(s) where there are two or more health and safety representatives at a workplace. The persons selected by the Contractor to serve on the committee shall be designated in writing.

The function of the health and safety committee shall be to hold meetings at regular intervals, but at least once every three months, to review the health and safety measures on the contract, to discuss incidents related to health and safety with the Contractor and the inspector, and to make recommendations regarding health and safety to the Contractor and to keep record of recommendations and reports made by the committee.

PB 7.5 Competent persons

In accordance with the Construction Regulations the Contractor has to appoint in writing **competent persons** responsible for supervising construction work on each of the following work situations that may be expected on the site of the works.

(a) Risk assessment and induction training as described in Regulation 7 of the Construction Regulations;

(b) Fall protection as described in Regulation 8;

(c) Formwork and support work as described in Regulation 10;

(d) Excavation work as described in Regulation 11;

(e) Demolition work as described in Regulation 12;

(f) Scaffolding work as described in Regulation 14;

(g) Suspended platform operations as described in Regulation 15;

(h) Material hoists as described in Regulation 17;

(i) Batch plant operations as described in Regulation 18;

(j) Explosive powered tools as described in Regulation 19;

(k) Cranes as described in Regulation 20;

(l) Construction vehicle and mobile plant inspections on a daily basis by a

(m) Competent person as described in Regulation 21(1);

(n) Control of all temporary electrical installation on the construction site as described in

Regulation 22;

(o) Stacking and storage on construction sites as described in Regulation 26; and

(p) Inspections of fire equipment as described in Regulation 27.

A competent person may be appointed for more than one part of the construction work with the understanding that the person must be suitably qualified and able to supervise at the same time the construction work on all the work situations for which he has been appointed.

The appointment of competent persons to supervise parts of the construction work does not relieve the Contractor from any of his responsibilities to comply with **all** requirements of the Construction Regulations.

PB 8 RECORDS AND REGISTERS

In accordance with the Construction Regulations the Contractor is bound to keep records and registers related to health and safety on site for periodic inspection by inspectors, the Engineer, the Employer, trade union officials and subcontractors and employees. The following records and registers must be kept on site and shall be available for inspection at all times.

(q) A copy of the OHSA 1993 Construction Regulations 2003;

(r) A copy of this Health and Safety Specification;

(s) A copy of the Contractor's Health and Safety Plan (Regulation 4);

(t) A copy of the Notification of Construction Work (Regulation 3);

(u) A health and safety file in terms of Regulation 5(7) with inputs by the Construction Safety Officer (Regulation 6(7));

(v) A copy of the risk assessment described in Regulation 7;

(w) A full protection plan and the corresponding records of evaluation and training of employees working from elevated positions as described in Regulation 8;

(x) Drawings pertaining to the design of structures (Regulation 9(3)) and formwork and support work structures (Regulation 10(d)) must be kept on site;

(y) Pronouncement of the safety of excavations must be recorded in a register to be kept on site (Regulation 11(3)(h));

(z) A copy of the certificate of the system design for suspended platforms (Regulation 15(3));

(aa) A notice must be affixed around the base towers of material hoists to indicate the maximum mass load, which may be carried at any one time by material hoists (Regulation 7(5));

(bb) Maintenance records of material hoists and inspection results must be kept in a record book to be kept on site (Regulation 17(8));

(cc) A record of any repairs to or maintenance of a batch plant must be kept on site (Regulations 18(9));

(dd) A warning notice must be displayed in a conspicuous manner when and wherever an explosive powered tool is used (Regulation 19(2));

(ee) A register for recording of findings by the competent person appointed to inspect construction vehicles and mobile plant (Regulation 21(1)(j)).

PB 9 CONTRACTOR'S RESPONSIBILITIES

For this contract the Contractor will be the mandatory of the Employer (Client), as defined in the Act (OHSA 1993), which means that the Contractor has the status of employer in his own right in respect of the contract. The Contractor is therefore responsible for all the duties and obligations of an employer as set out in the Act (OHSA 1993) and the Construction Regulations 2003.

Before commencement of work under the contract, the Contractor shall enter into an agreement with the Employer (Client) to confirm his status as mandatory (employer) for the contract under consideration.

The Contractor's duties and responsibilities are clearly set out in the Construction Regulations 2003, and are not repeated in detail but some important aspects are highlighted hereafter, without relieving the Contractor of any of his duties and responsibilities in terms of the Construction Regulations.

(a) Contractor's position in relation to the Employer (Client) (Regulation 4)

In accordance with Section 4 of the Regulations, the Contractor shall liaise closely with the Employer or the Engineer on behalf of the Employer, to ensure that all requirements

of the Act and the Regulations are met and complied with.

(b) The Principal Contractor and Contractor (Regulation 5)

The Contractor is in terms of the definition in Regulation 2(b) the equivalent of Principle Contractor as defined in the Construction Regulations, and he shall comply with all the provisions of Regulation 5.

Any subcontractors employed by the Contractor must be appointed in writing, setting out the terms of the appointment in respect of health and safety. An independent subcontractor shall however provide and demonstrate to the Contractor a suitable, acceptable and sufficiently documented health and safety plan before commencement of the subcontract. In the absence of such a health and safety plan the subcontractor shall undertake in writing that he will comply with the Contractor's safety plan, the health and safety specifications of the Employer and the Construction Regulations 2003.

(c) Supervision of construction work (Regulation 6)

The Contractor shall appoint the safety and other personnel and employees as required in terms of Regulation 6 and as set out in paragraph 7 above. Appointment of those personnel and employees does not relieve the Contractor from any of the obligations under Regulation 6.

(d) Risk assessment (Regulation 7)

The Contractor shall have the risk assessment made as set out in paragraph 7 above before commencement of the work and it must be available on site for inspection at all times. The Contractor shall consult with the health and safety committee or health and safety representative(s) etc. on a regular basis to ensure that all employees, including subcontractors under his control, are informed and trained by a competent person regarding health hazards and related work procedures.

No subcontractor, employee or visitor shall be allowed to enter the site of works without prior health and safety induction training, all as specified in Regulation 7.

(e) Fall protection (Regulation 8)

Fall protection, if applicable to this contract shall comply in all respects with Regulation 8 of the Construction Regulations.

(f) Structures (Regulation 9)

The Contractor will be liable for all claims arising from collapse or failure of structures if he failed to comply with all the specifications, project specifications and drawings related to the structures, unless it can be proved

That such collapse or failure can be attributed to faulty design or insufficient design standards on which the specifications and the drawings are based.

In addition the Contractor shall comply with all aspects of Regulation 9 of the Construction Regulations.

(g) Formwork and support work (Regulation 10)

The Contractor will be responsible for the adequate design of all formwork and support structures by a competent person.

All drawings pertaining to formwork shall be kept on site and all equipment and materials used in formwork, shall be carefully examined and checked for suitability by a competent person.

The provisions of Regulation 10 of the Construction Regulations shall be followed in every detail.

(h) Excavation work (Regulation 11)

It is essential that the Contractor shall follow the instructions and precautions in the Standard Specifications and Project Specifications as well as the provisions of the Construction Regulations to the letter as unsafe excavations can be a major hazard on any construction site. The Contractor shall therefore ensure that all excavation work is carried out under the supervision of a competent person, that inspections are carried out by a Professional Engineer or Technologist, and that all work is done in such a manner that no hazards are created by unsafe excavations and working conditions.

Supervision by a competent person will not relieve the Contractor from any of his duties and responsibilities under Regulation 11 of the Construction Regulations.

(i) Demolition work (Regulation 12)

Whenever demolition work is included in a contract, the Contractor shall comply with all the requirements of Regulation 12 of the Construction Regulations. The fact that a competent person has to be appointed by the Contractor does not relieve the Contractor from any of his responsibilities in respect of safety of demolition work.

(j) Tunneling (Regulation 13)

The Contractor shall comply with Regulation 13 wherever tunneling of any kind is involved.

(k) Scaffolding (Regulation 14)

The Contractor shall ensure that all the provisions of Regulation 14 of the Construction Regulations are complied with. [Note: Reference in the Regulations to “Section 44 of the Act” should read “Section 43 of the Act”].

(l) Suspended platforms (Regulation 15)

Wherever suspended platforms will be necessary on any contract, the Contractor shall ensure that copies of the system design issued by a Professional Engineer are submitted to the Engineer for inspection and approval. The Contractor shall appoint competent persons as supervisors and competent scaffold erectors, operators and inspectors and ensure that all work related to suspended platforms are done in accordance with Regulation 15 of the Construction Regulations.

(m) Boatswain’s chain (Regulation 16)

Where boatswain's chains are required on the construction site, the Contractor shall comply with Regulation 16.

(n) Material Hoists (Regulation 17)

Wherever applicable, the Contractor shall comply with the provisions of Regulation 17 to the letter.

(o) Batch plants (Regulation 18)

Wherever applicable, the Contractor shall ensure that all lifting machines, lifting tackle, conveyors, etc. used in the operation of a batch plant shall comply with, and that all operators, supervisors and employees are strictly held to the provisions of Regulation 18. The Contractor shall ensure that the General Safety Regulations (Government Notice R1031 of 30 May 1986), the Driven Machinery Regulations (Government Notice R295 of 26/2/1988) and the Electrical Installation Regulations (Government Notice R2271 of 11/10/1995) are adhered to by all involved.

In terms of the Regulations, records of repairs and maintenance shall be kept on site.

(p) Explosive powered tools (Regulation 19)

The Contractor shall ensure that, wherever explosive-powered tools are required to be used, all safety provisions of Regulation 19 are complied with.

It is especially important that warning notices are displayed and that the issue and return of cartridges and spent cartridges be recorded in a register to be kept on site.

(q) Cranes (Regulation 20)

Wherever the use of tower cranes becomes necessary, the provisions of Regulation 20 shall be complied with.

(r) Construction vehicles and mobile plant (Regulation 21)

The Contractor shall ensure that all construction vehicles and plant are in good working condition and safe for use, and that they are used in accordance with their design and intended use. The vehicles and plant shall only be operated by workers or operators who have received appropriate training, all in accordance with all the requirements of Regulation 21.

All vehicles and plant must be inspected on a daily basis, prior to use, by a competent person and the findings must be recorded in a register to be kept on site.

(s) Electrical installation and machinery on construction sites (Regulation 22)

The Contractor shall comply with the Electrical Installation Regulations (Government Notice R2920 of 23 October 1992) and the Electrical Machinery Regulations (Government Notice R1953 of 12 August 1993). Before commencement of construction, the Contractor shall take adequate steps to ascertain the presence of, and guard against dangers and hazards due to electrical cables and apparatus under, over or on the site.

All temporary electrical installations on the site shall be under the control of a competent person, without relieving the Contractor of his responsibility for the health and safety of all workers and persons on site in terms of Regulation 22.

(t) Use of temporary storage of flammable liquids on construction (Regulation 23)
The Contractor shall comply with the provisions of the General Safety Regulations (Government Notice R1031 of 30 May 1986) and all the provisions of Regulation 23 of the Construction Regulations to ensure a safe and hazard-free environment to all workers and other persons on site.

(u) Water environments (Regulation 24)

Where construction work is done over or in close proximity to water, the provisions of Regulation 24 shall apply.

(v) Housekeeping on Construction sites (Regulation 25)

Housekeeping on all construction sites shall be in accordance with the provisions of the environment Regulations for workplaces (Government Notice R2281 of 16 October 1987) and all the provisions of Regulation 25 of the Construction Regulations.

(w) Stacking and storage on construction sites (Regulation 26)

The provisions for the stacking of articles contained in the General Safety Regulations (Government Notice R1031 of 30 May 1986) as well as all the provisions Regulation 26 of the Construction Regulations shall apply.

(x) Fire precautions on construction sites (Regulation 27)

The provisions of the Environmental Regulations for Workplaces (Government Notice R2281 of 16 October 1987) shall apply.

In addition the necessary precautions shall be taken to prevent the incidence of fires, to provide adequate and sufficient fire protection equipment, sirens, escape routes etc. all in accordance with Regulation 27 of the Construction Regulations.

(y) Construction welfare facilities (Regulation 28)

The Contractor shall comply with the construction site provisions as in the Facilities Regulations (Government Notice R1593 of 12 August 1988) and the provisions of Regulation 28 of the Construction Regulations.

(z) Non-compliance with the Construction Regulations 2003

The foregoing is a summary of parts of the Construction Regulations applicable to all construction projects.

The Contractor, as employer for the execution of the contract, shall ensure that all provisions of the Construction Regulations applicable to the contract under consideration are complied with to the letter.

Should the Contractor fail to comply with the provisions of the Regulations 3 to 28 as listed in Regulation 30, he will be guilty of an offence and will be liable, upon conviction, to the fines or imprisonment as set out in Regulation 30.

The Contractor is advised in his own interest to make a careful study of the Act and the Construction Regulations as ignorance of the Act and the Regulations will not be accepted in any proceedings related to non-conformance to the Act and the Regulations.

PB 10 MEASUREMENT AND PAYMENT

PB 10.1 Principles

It is a condition of this contract that Contractors, who submit tenders for this contract, shall make provision in their tenders for the cost of all health and safety measures during the construction process. All associated activities and expenditure are deemed to be included in the Contractor's tendered rates and prices.

(a) Safety Personnel

The Construction Supervisor, the Construction Safety Officer, Health and Safety Representatives, Health and Safety Committee and Competent Persons referred to in clauses 7.1 to 7.5 shall be members of the Contractor's personnel, and no additional payment will be made for the appointment of such safety personnel.

(b) Records and Registers

The keeping of health and safety-related records and registers as described in 8 is regarded as a normal duty of the Contractor for which no additional payment will be considered, and which is deemed to be included in the Contractor's tendered rates and prices.

PC <u>ENVIROMENTAL MANAGEMENT SPECIFICATIONS</u>

PC 1 General

In order to ensure that the construction works is carried out in an environmentally sensitive matter, strict compliance to the Environmental Management Plan (EMP) guidelines is required. The purpose of the EMP is to:

- Encourage good management practices through planning and commitment to environmental issues,
- Provide rational and practical environmental guidelines to:
  i. Minimise disturbance of the natural environment,
  ii. Prevent pollution of land, air and water,
  iii. Prevent soil erosion and facilitate re-vegetation.
- Adopt the best practicable means available to prevent or minimise adverse environmental impact,
- Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of wastes,
- Train employees and contractors with regard to environmental obligations.

PC 2 Training and Induction of Employees

- The Contractor has a responsibility to ensure that all those people involved in the project are aware of and familiar with the environmental requirements for the project (this includes sub-contractors, casual labour, etc.). The CMP shall be part of the terms of reference for all contractors, sub-contractors and suppliers.

PC 3 Complaints Register and Environmental Incident Book

Any complaints received by the project team from the public will be recorded. The complaint should be brought to the attention of the site manager, who will respond.

The following information must be recorded:

- Time, date and nature of the complaint,
- Type of communication (telephone, letter etc),
- Name, contact address and telephone number of the complainant,
- Response and investigation undertaken and
- Actions taken and by whom.

All complaints received will be investigated and a response given to the complainant within 14 days.

All environmental incidents occurring on the site will be recorded. The following information will be provided:

- Time, date, location and nature of the incident,
- Actions taken and by whom.

PC 4 Site Cleanliness and Neatness

- Location of a construction camp is to be approved by the Engineer and is to be restored to its previous condition after completion of construction.
- The construction camp should preferably be fenced with a 1.8m bonnox fence or similar approved.
- All materials, equipment, plant and vehicles must be stored within the construction camp.

  A dedicated area must be made available for construction staff to change and store their personal belongings and linings of the "Single Wire" type.

PC 5 Access

Access to existing roads, schools, buildings, shops and residential properties must not be impeded during construction.

Access roads utilised by the Contractor must be maintained in good condition.

PC 6 Borrow Pits

- Mining authorisations (permits) for borrow pits must be obtained from the Department of Minerals and Energy (DME) in consultation with the Department of Water Affairs and Forestry (DWAF).
- Spoil dumps resulting from borrow pits must not interfere with any natural surface drainage.
- Borrow pits must be rehabilitated after use in accordance with the requirements of DME and DWAF.

PC 7 Dust Control / Air Quality

- Dust suppression measures must be implemented during construction by ensuring that all surfaces prone to dust generation are kept damp. (e.g. use of water tanker)
- Ensure that vehicles and equipment are in good working conditions and that emissions are not excessive.
- Ensure that vehicles and equipment are in good working conditions and that emissions are not excessive.
- Special care must be taken in areas where the route passes close to schools and residential areas.

- The speed of construction vehicles must be reduced.

PC 8 Fauna

- Contractor staff may not chase, catch or kill animals encountered during construction.

PC 9 Fire Prevention and Control

- Smoking is prohibited in the vicinity of flammable substances.
- The contractor must ensure that fire-fighting equipment is available on site, particularly where flammable substances are being stored or used, and that construction staff are aware of where it is kept and how it is operated.
- Fires started for comfort (warmth) are prohibited, due to the risk of veld fires and risk to adjacent property owner's lands.

PC 10 Grave Sites

- Gravesites in close proximity to the road must not be disturbed during construction.

PC 11 Materials Handling and Spills Management

- Any hazardous materials to be used during construction (e.g. lime, fuel, paint, etc) are to be stored in a designated area at the campsite.
- The storage containers/facilities (including any diesel/petrol tanks) must be placed on an impermeable surface and surrounded by a bund wall, in order to ensure that accidental spillage does not pollute the environment.
- Workers must at all times be made aware of the health and safety risks associated with any hazardous substances used (e.g. smoking near fuel tanks), and must be provided with appropriate protective clothing/equipment in case of spillages or accidents.
- Ensure all staff and contractors undergo relevant training in the maintenance of equipment to prevent the accidental discharge or spill of fuel, oil, lubricants and other chemicals
- Any spill of potentially hazardous materials must be cleaned up immediately (Potentially hazardous materials on site include paint, oil, grease, fuel, turpentine, etc).
- The area of contaminated soil or spill must be deposited into the hazardous waste container(s).
- The contractor should keep Peat Sorb or a similar absorbent on site to clean up any spills. The absorbent must be stored in a designated area and be available for inspection.
- All spills are to be recorded in the environmental incident book.

PC 12 Noise

- Noise generating activities must be restricted to between 07h00 and 17h00 Monday to Friday, unless otherwise approved by the appropriate competent person in consultation with adjacent landowners/affected persons.
- All equipment, vehicles and machinery must be in good working condition and be equipped with sound mufflers if necessary.
- Construction staff must be trained and made aware of not creating unnecessary noise such as hooting and shouting.

PC 13 Pollution Control

- Soil and water pollution through usage of fuel, oil, paint, bitumen or other hazardous substances must be avoided.
- All construction vehicles are to be maintained in good working order so as to prevent soil or water pollution from oil, fuel or other leaks, and to reduce noise pollution.

PC 14 Rivers and Streams

- During construction of bridge structures, there must be no obstruction of the water flow of rivers and streams.
- Excavated material must not be stockpiled on or near riverbanks, in order to prevent sedimentation occurring.
- Erosion control measures must be employed both during and after construction.
- No impediments to natural surface water flow, other than approved erosion control measures, must occur.

PC 15 Safety

- Safety measures, such as detour signs, must be implemented during construction to ensure the safety of workers, pedestrians and drivers/passengers in vehicles in the vicinity of construction work.
- Special care must be taken in the vicinity of schools to ensure the safety of children wishing to cross the road under construction.
- The relevant signage (e.g. speed control signs) must be erected alongside the road during the operation phase in order to control traffic.
- Accommodation must be made for pedestrian pathways alongside the road during the construction and operation phases.

PC 16 Soil Management

- Stormwater drainage pipes must be installed alongside the road in all areas susceptible to soil erosion.
- Erosion should be minimized by the construction of meadow drains and the planting of indigenous vegetation on the side slopes and drains to reduce flow velocity of stormwater.
- Spoil from cuts may be used in existing erosion galleys.
- Stone pitching and gabions should be constructed at pipe culvert outlets.

  Accidental spills of contaminants onto the ground e.g. oil, concrete, fuel and chemicals

  should be removed together with the contaminated soil.
- If necessary an absorbent such as Peat Sorb should be used the aid in cleaning up the spill. The contaminated soil should be disposed of in an appropriate container, depending on its classification.
- Servicing and re-fuelling of vehicles must only be carried out at construction camp.

PC 17 Worker Conduct

Code of Conduct for Construction Personnel:

- Do not leave the construction site untidy and strewn with rubbish which will attract animal pests.
- Do not set fires.
- Do not cause any unnecessary, disturbing noise at the construction camp/site or at any designated worker collection/drop off points.
- Do not drive a construction-related vehicle under the influence of alcohol.
- Do not exceed the national speed limits on public roads or exceed the recommended speed limits on the site.
- Do not drive a vehicle which is generating excessive noise or gaseous pollution (noisy vehicles must be reported and repaired as soon as possible).

- Do not litter along the roadsides, including both the public and private roads.
- Do not pollute any water bodies (whether flowing or not).
- No member of the construction team is allowed to enter the areas outside the construction site.

PC 18 Traffic Disturbances and Diversions

- Any traffic diversions must be undertaken with the approval of all relevant authorities and in accordance with all relevant legislation.
- Wherever possible, traffic diversion must only take place on existing disturbed areas and remain within the existing road reserve.
- Traffic diversion routes must be rehabilitated after use.

PC 19 Vegetation

- Only vegetation falling directly on the route must be removed where necessary.
- Alien vegetation within the road reserve must be eradicated, and management measures must be implemented for future control of these species.
- Vegetation that has been removed from large areas (e.g. on traffic diversion routes) during construction must be replaced with indigenous vegetation after construction has been completed.

PC 20 Waste Management

- All general, non-hazardous waste must be placed in a skip container and disposed of at a registered waste disposal site.
- The contractor is to ensure that the portable toilet facilities at the campsite are properly maintained and in working order.
- No disposal, or leakage, of sewage must occur on or near the site.
- All hazardous waste (e.g. oil, paint, empty lime bags, contaminated wash water, etc) must be stored in leak proof containers and disposed of at a registered hazardous waste disposal site.
- The contents of waste storage containers must, under no circumstances, be emptied to the surrounding area. In general, littering, discarding or burying of any materials is not allowed on site or along the route.
- Adequate waste receptacles must be available at strategic points around the construction camp and site for all domestic refuse and to minimize the occurrence of littering.
- Concrete rubble must be collected and disposed of as directed by the Project Manager.
- Each working area must be cleared of litter and building waste (e.g. rubble, wood,

  concrete packets etc) on completion of the day's work.

  Any spill around the container(s) should be treated as per Section C11 and C16.

PE ELECTRICAL INSTALLATION

PE 1 SCOPE

PE 1.1 INTRODUCTION

An assessment of the Carolina Water Treatment Works (WTW) was conducted in an effort to investigate the condition and functionality of the existing electrical and instrumentation infrastructure to cater for the construction of Silobela Extension 5 pump station. The assessment was also conducted to identify feasible options to supply power to the abovementioned pump station.

PE 1.2 ELECTRICAL INFRASTRUCTURE

The electricity supply to the Carolina WTW is through the 11kV overhead lines that terminate at the pole fused links. From the pole fused links, the 11kV cables feed an 11kV/415V, 630kVA transformer housed in a miniature substation. The transformer steps down 11kV to 415V, which is a suitable voltage for plant equipment. The Carolina WTW is metered by Eskom on the Low Voltage (LV) compartment of the miniature substation. The 2x4 Core SWA\PVC 185mm^2 cables run from the LV busbars, in the miniature substation, to the generator changeover panel. The generator is rated at 520kVA, with 800A MCCB's in the changeover panel, located in the generator room. From the changeover panel, the feeder cable supply the main MCC located in the pump station.

The existing MCC is fed from the generator changeover panel via 2x4 Core SWA\PVC 185 mm^2, as stated above. During the assessment, it was observed that the MCC has no spare cubicles to add new feeders. The MCC is also installed in a confined space, which is not possible to extend it. Therefore, it will not be possible to supply power to the Silobela Extension 5 pump station from the existing MCC.

EXISTING GENERATOR

1.1.1 The existing generator has a rated prime power of 520kVA, which feeds the existing MCC in the plant. Based on the desktop study calculations, the existing running load is rated at 420kVA. The additional load in the new pump station will increase the total plant running load to 576kVA, which is above the generator rating. This indicates that the new pump station will need a new dedicated generator for the pump station.

RECOMMENDATIONS

1.1.2 The recommendations itemized below stipulate best possible options/ solutions to supply power to the new pump station, based on the plant assessment.

- Install a new feeder cable from the existing mini-sub to the new pump station, since the existing MCC does not have spare capacity / cubicles.
- Install a new MCC dedicated for the new pump station to cater for its load
- Install a Remote Terminal Unit (RTU) to accommodate the telemetry system between the pump station and the Silobela Reservoir.
- Install a telemetry system to avoid pumping potable water to the reservoir blindly.
- Install a new generator dedicated for the new pump station. This option seems to be improbable due to space constraints on site. The plant future upgrade will have to cater for this.

2 ELECTRICAL & INSTRUMENTATION DESIGN

The electrical & instrumentation scope for the new pump station construction will entail the following;

- Installation of new 2x50mm2 supply cables to the new pump station MCC.
- 150m cable trench excavation and backfilling for the supply cable.
- Installation of the new MCC as illustrated in the pump station electrical layout drawing.
- Installation of 110kW free standing VSDs
- Installation of a PLC and RTU.
- Installation of a telemetry system.
- Installation of sensors and actuators,

2.1 LOW VOLTAGE INFRASTRUCTURE

The desktop study calculations deduced the total plant running load of 488kW (real power) / 575kVA (apparent power) – a 630kVA transformer in a miniature substation will be sufficient to cater for the plant running load, including the new pump station.

The supply cable, 2x50mm2 4 Core SWA\PVC, cable will be terminated on the mini-sub LV compartment busbars. This cable will be run underground to supply power to the new MCC.

2.2 MOTOR CONTROL CENTRE

The LV electrical supply to the new MCC will be at 400V nominal, 172kVA, 50Hz, provided from the existing mini-sub. The incomer circuit breaker will be of motorised adjustable circuit breaker type, rated at 200A, 400V. This circuit breaker must be capable of protecting the MCC busbars and the supply cable.

The MCC will be equipped with a 200A incomer circuit breaker. The MCC busbars housed in a dedicated compartment will be fed from this circuit breaker. The feeder circuit breakers will be fed from the busbars where the pump station equipment will be connected.

2.2.1 MCC BUSBARS

The MCC rectangular copper busbars are selected over aluminum/ circular busbars due to electrical and thermal properties advantages. These busbars will be rated at 400V, 200A, 50Hz, 35kA (3s), which will cater for possible load increase in future and will serve as a point of common coupling / distribution to the loads as illustrated in the single line diagram.

The rating of the busbars was based on the current density of rectangular copper busbars as stipulated on SANS 10142-1. The current density used to size the busbars was 1.6A/mm2 which is used for busbars rated below 1600A. The calculated size of the busbars was 70mmx10mm (HxW).

PE 2.2.1 CONTROL TRANSFORMER

A single phase control transformer will be connected from the two phases of the MCC main busbars. The control transformer will be rated at 400/230 V, 10kVA, 50 Hz. The secondary side of the transformer will supply single phase power to the control busbars with a constant AC voltage of 230V. This control transformer must be protected by a 2-pole circuit breaker rated at 16A, 400 V, connected on the primary side of the transformer. The transformer will feed the control busbar in the MCC where the Programmable Logic Controller (PLC) Power Supply (PSU) will be fed from..

PE 2.2.3 SURGE PROTECTION

The MCC will be equipped with surge arresters of class 1 and 2 combination type. The surge arresters must be capable of protecting the downstream network by capturing high voltage current surges occurring on the system. The high voltage current surges must be sent directly to ground in the event of surges occurrence, in accordance with SANS 10142-1.The surge arresters must be equipped with series pre-fusing fuses. These fuses must be rated at 125 A, 35 kA (same fault level as the MCC fault level). They must be capable of isolating surge arresters under fault conditions as the arresters take high current surges to the ground.

PE 2.2.4 POWER QUALITY METER

The MCC will be equipped with electronic Power Quality Meter (PQM) of Power logic PM5300 type or similar approved. The PQM will be installed in the panel door of the metering cubicle in the MCC and must be capable of displaying line and phase voltages, line currents, kW, kVA, kVAR, power factor, energy metering as well as measuring voltage and current harmonic distortion. The PQM must be fitted with an Ethernet communication port for network communication with the PLC and telemetry equipment.

PE 2.2.5 POWER SUPPLY

The Power Supply (PSU) will be fitted in the MCC panel, which will supply power to the PLC cabinet (a standalone panel adjacent to the MCC panel). The PSU will be equipped a rectifier which will convert 230 VAC to 24 VDC. The power supply must be capable of charging batteries which will store power for a maximum period of 6 hours. In the event of power failure, these batteries will supply power to the PLC and field sensors with the operating voltage of 24 VDC.

PE 2.2.6 VARIABLES SPEED DRIVERS

All VSDs will be used to control and regulate the speed of pump-motor sets. They must be capable of providing smooth linear acceleration during starting and stopping by means of increasing the motor supply frequency from zero to the desired operational speed on an adjustable time ramp during run-up and the reverse on deceleration to standstill. All VSDs will have serial communication capability to communicate on an Ethernet communication bus to the controlling PLC. The panel doors for VSDs will be interlocked that it is not possible to open any panel door without switching the main circuit breaker for that drive. The VSDs will be equipped with the door mount display which will allow the operator to monitor the VSDs and make changes without opening the panel door making for a safer installation.

PE 2.3 LIGHTNING PROTECTION & EARTHING SYSTEM

Earthing must be done in compliance with SANS10142-1 and SANS 10142-2: The Wiring of Premises. The earth mat must be 1.0m × 1.0m (minimum) constructed from 70 mm2 solid copper conductor with 100 mm grid spacing, connected to the distribution transformer. Earth rods will be installed at the four corners, if the measured resistances do not meet the earthing requirements. The proposed pump station will be provided with a lightning protection system comprising a 70 mm2 bare copper ring main around the building connected to a series of copper clad earth spikes driven into the ground. The quantity and spacing must suit the ground resistivity survey and earth resistance required (max 10 Ω). 70 mm2 PVC insulated earth wires will be connected from the trench earth and installed up brickwork for connection to the reinforcing steel in concrete floors and to roof sheeting and structural members where installed. The roof terminal conductor will intercept any lightning strikes and safely divert these to the earthing system in the ground.

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PE 2.4.1 PROGRAMMABLE LOGIC CONTROLLER

The PLC will be installed in its cabinet in the MCC room as indicated in the MCC General Arrangement. The PLC must be able to perform logic sequence switching, arithmetical calculations to do switching based on actuators and sensors input and process control requiring PID control. The PLC will be configured on a modular basis, with power supply, CPU, input, output, communication and process sections as separate modules slotted into a mounting rack. Field wiring will terminate on separate terminal sections such that modules can be removed without disconnection of wiring.

PE 4 CABLING

The supply and installation of power and control cables shall comply with the requirements of the Standard Electrical Specification.

PE 4.2 INSTALLATION

Cable trenches may be provided inside the buildings and cables shall be installed on cable ladders/trays mounted against the side-walls of the trenches as specified and shown on the layout drawings. Otherwise, the cables shall be installed on cable ladders/trays mounted against the pump station walls and floor. The Contractor shall forward drawings showing the proposed MCC panel layouts and cable runs before any installation of cable ladders/trays commences. The onus is on the Contractor to ensure that the cable ladder/trays are sized correctly.

PE 5 POWER FACTOR CORRECTION

No power factor correction capacitors are required on the main pump sets.

PE 6 LIGHTING AND SMALL POWER

The existing interior and exterior lighting shall be connected to the new LV distribution board section on the new MCC in the pump station. All existing interior and exterior light fittings are to be replaced with water-proof twin-tube LED luminaires.

PE 7 EARTHING

All the earth bars and the pump motors shall be inter-connected with 70 sq. mm bare copper earth wire and connected to the pump station main earth electrode/earth mat.

PE 8 LIGHTNING PROTECTION

All electronic equipment and signal cables shall be provided with lightning protection devices.

PE 9 CONTROL AND INSTRUMENTATION GENERAL

PE 9.1 SCOPE

This Section covers the design, supply, delivery, installation, testing, commissioning and guarantee of the control and instrumentation (C&I) system of the River Pump Station at Mayflower.

The C&I system consists of:

- Pressure switches
- Flow switches
- Level sensors (where applicable)
- Flow meters
- Flow valves

This Contract includes:

- Instrumentation cabling;
- Interfacing to the pump control panels.

Provision of the display read-out of the flow meters on the MCC Panel.

Any other installation work and materials stated or implied to provide for a complete, working installation in accordance with the Specifications, Drawings and technical schedules; and

A complete data pack including record drawings, O&M manuals, etc.

PE 9.3 I/O AND INSTRUMENTATION WORK

The work shall include the supply, delivery, installation, connection, and testing and commissioning of the entire installation, including all cabling, terminators, connectors, I/O modules, power supplies, and measuring instruments.

All flow meters shall have a separate power supply board fed from the LV panel, as well as a local level display and transmitter, with cabling to the MCC as required.

PE 10 CABLING FOR CONTROL AND INSTRUMENTATION

Cable sizes, types and approximate lengths for tender purposes shall be as shown in the Bill of Quantities.

The Bill of Quantities has been prepared using estimated quantities of cables. However, the final design shall be done by the Contractor based on the actual equipment offered, and the final cable schedules, showing cable types, sizes, source, destination, route, termination details and estimated quantities shall be drawn up by the Contractor once the final design has been submitted to and approved by the Engineer.

PE 11 CONTROL PHILOSOPHY

The control philosophy is described elsewhere in this document.

PE 12 CONTRACTORS DRAWINGS

The Contractor shall submit drawings for the following purposes:

- Concept design: for assessment
- Manufacturing (workshop): for approval
- Installation: for approval
- As-built: for records

PE 12.1 CONCEPT DESIGN DRAWINGS

The Contractor shall submit concept design drawings for review by the Engineer before commencing with manufacturing drawings.

Concept drawings submitted by the Contractor shall give sufficient information to make a proper assessment of the Plant offered and sufficient detail to enable the dimensions and general arrangement of the Plant to be determined. All the important parts shall be shown in detail, e.g. gate body, scaling arrangements, bearing arrangements, guides, and wheels.

Drawings shall include details of parts to be built into and loads to be transferred to the civil engineering works, the routes and sizes of cabling, cable ducts or trunking, hydraulic pipework, a description of erection methods, operating and control units, position indicators and details of connections to any other plant.

PE 12.2 MANUFACTURING (WORKSHOP) DRAWINGS

a) Before commencing with fabrication, drawings in triplicate shall be submitted for approval by the Engineer. These drawings shall cover the general arrangement, assembly and supporting detailed drawings of the plant offered and their related ancillary plant.

b) The drawings shall provide complete information regarding the thickness and types of material, the finishing of surfaces, fixing and connections, standard parts, tolerances, clearances with regard to other machine parts or building faces and in general everything that may have a bearing on the satisfactory fabrication, erection and operation of the plant shown on these drawings.

c) Electrical Plant wiring and/or hydraulic diagrams for the sub-assemblies, such as distribution and control boards, as well as overall integrated cabling and wiring diagrams for the complete installation shall be prepared and submitted in a similar fashion to these drawings.

d) These drawings shall be submitted within the period(s) indicated on the construction programme and agreed with the Engineer. All drawings submitted shall signify authorisation by the Contractor. The submission of the Contractor's Drawings shall be accompanied by one or more updated index sheets prepared on A3-size sheet listing all drawings with numbers, titles and status of amendments.

e) Two weeks after submission by the Contractor or 10 days in the event of re-submission, the Engineer shall return one of the above-mentioned prints either with his certified approval or with his comments regarding any amendments that may be required. A drawing returned to the Contractor for amendment purposes shall be re-submitted in its amended form within 2 weeks of the date of receipt of the drawing by the Contractor.

f) Approval of the above drawings by the Engineer shall only signify approval of the general design and layout and shall not make the Engineer liable for any error by the Contractor.

g) Priority shall be given to those drawings regarding items that affect the concrete or other construction work of a civil engineering nature. These drawings shall detail in full, the necessary provisions to be made in the concrete or other supporting structure(s) for the casting in of embedded parts and anchors for the fixing of built-in parts and plant.

h) All the foundation details and the positions and dimensions of all connecting rods, pockets, vent ducts, cable ducts, anchor bolt holes and similar items, as well as aligning, fixing, anchoring and second-stage concrete requirements, shall be clearly indicated and detailed on these drawings with the general requirements for built-in parts.

i) The magnitudes and directions of all forces and loads, both static and dynamic, exerted by the Plant on the supporting concrete structure shall be clearly and fully detailed on the Contractor's Drawings. Any special requirements to prevent transmitting possible vibrations shall also be shown.

PE 12.3 INSTALLATION DRAWINGS

a) Not later than 21 days after the proposed Plant has been approved, drawings shall be

submitted to allow for adequate site preparation before the arrival of the Plant. These drawings shall offer the necessary details for the programming of civil works, including foundation details and anchor bolts.

b) The Engineer has the right to suspend manufacture until a set of drawings, calculations, a draft operation and maintenance manual and quality control plans (for the manufacture and corrosion protection, including data sheets, of paint and abrasives used) are in his possession and approved in principle.

PE 12.4 AS-BUILT DRAWINGS

a) On the completion of the Works, the Contractor shall deliver to the Engineer's office one complete set in triplicate of high-quality paper copies together with an electronically saved version (preferably on compact disc) of the Contractor's Drawings, updated to reflect the as-built information. These drawings shall be clearly marked as "As-Built".

b) These drawings shall contain general arrangements, assemblies, parts lists (including part numbers) and complete component details as well as wiring and hydraulic diagrams. These items are required in draft form before the tests on completion are commenced and in final form before taking-over in terms of the General Conditions of Contract.

c) Layout Drawings shall be marked up by the Contractor showing all dimensions to buildings, including the relative positions of underground cables.

PE 12.5 DRAWING FORMAT

a) Drawings provided by the Contractor shall be to scale size A3 produced in hard copy and electronically in PDF format. Each Drawing shall show the following particulars in the lower right-hand corner:

- Name of Employer;
- Name of Engineer;
- Name of Contractor;
- Project title;
- Contract number;
- Title of Drawing (location, item and detail);
- Scale;
- Date of Drawing;
- Details of electrical supply (where applicable);
- Drawing number; and
- Revision identification.

b) Dimensions on all Drawings shall be metric.

c) A blank space 45 mm by 30 mm shall be provided as an extension of the title block for the Engineer's approval stamp. Provision shall be made for details of revisions to be recorded above the title block. Prints of Drawings shall be in the form of black lines on a white background.

PE 13 MEASURMENT AND PAYMENT

PE 13.1 General – Supply and Delivery to Site

The rates tendered shall include full compensation for the supply and delivery, including supply of raw materials and bought-out items, fabrication/manufacture/assembly, system design, quality inspection/tests including those witnessed by the Engineer, type and routine tests, the application

of finishes (paint or corrosion protection), trial erection and dismantling, preparation and packing for transport, transport from place of manufacture to the Site, insurance, harbour dues, etc. during transport, loading and unloading, storage under appropriate conditions from the date of delivery until the commencement of installation and any other work specified.

PE 13.2 General – Installation

Measurement of installation shall be certified once each sub-system has been inspected and the pre-commissioning thereof has been witnessed and accepted by the Engineer.

The tendered rates shall include full compensation for the installation, including the provision of all labour, equipment, transport, materials and temporary works necessary to recover from storage and install the complete works, on-site quality assurance and quality control, inspection and testing (including attendance at tests witnessed by the Engineer), the installation and supply of all consumables (electricity, fuel, oil, lubricants, etc.) necessary for the operation of the installation, i.e. the pre-commissioning, until taken over by the Employer, the putting into service of the complete installation and any other work specified.

PE14 TESTING ON SITE AND COMMISSIONING

PE14.1 Preliminary Testing

The contractor shall make use of suitably qualified personnel, equipped with all necessary test equipment, to carry out all preliminary testing to ensure that all equipment is functioning correctly and free of inherent defects or faults. The Engineer shall be kept informed of the details regarding preliminary testing and shall be available to witness and comment on any relevant matters. Testing shall include but not be limited to:

a) Complete physical check on all wiring, wire numbering and termination block numbering and preparation of as-built drawings accordingly.

b) Physical check on all electrical clearances.

c) Pressure testing of all busbars, switchgear panels and secondary wiring.

d) Complete primary injection testing to confirm the correctness and accuracy of the complete protection design.

e) Physical checking of all operating mechanisms and adjustments on all switching equipment.

f) Calibration and setting up of all equipment to ensure proper operation.

g) Such further checks as the Engineer may require subsequent to the energising of the pump station, to ensure that all equipment is operating correctly in conjunction with other parts of the installation to form a complete system.

PE14.2 Combined Testing

Before combined running and operational testing commences in co-operation with other Contractors, a programme shall be drawn up and handed to the Engineer, setting out the procedures and requirements that ate necessary to ensure that testing progresses smoothly.

The programme shall also indicate the involvement of specialist personnel from suppliers (e.g. VSD and PLC/SCADA equipment) that shall be involved in these aspects of the project.

Tests may include the following:

a) Operation of equipment on Manual control.

b) Assisting other Contractors (e.g. pump suppliers, instrumentation and control contractors) to get their equipment working satisfactorily.

c) Filling of pipe lines and reservoirs.

d) Testing and/or simulating all possible running conditions and fault situations.

e) Full functional testing and checking of all telemetry signals and communications.

f) Ensuring that the proposed functional operating processes work in practice.

Fully automatic operation as an integrated system of all power, and control equipment to the satisfaction of the Engineer and the Employer.

PE14.3 Settings

The Contractor shall further be required to calculate the required protection settings to ensure proper grading of protection devices in the pump stations.

The settings shall be submitted to the Engineer for approval at least 10 (ten) weeks prior to the energising date for the pump station.

All testing equipment and power supplied for testing shall be provided by the Contractor as part of the commissioning process.

The total costs for the complete commissioning, relay calculations and settings of relays shall be included in the tendered rates.

PE15. TRAINING OF OPERATING STAFF

PE15.1 Formal Training

The Contractor shall state a price in the Schedules of Quantities and Prices relevant equipment for providing formal training on the VSD equipment, in a training centre, for the Client's operating personnel. This shall be programmed to take place before testing on site commences.

Such training shall be done by experienced and qualified experts and shall include both theoretical and practical content relating directly to the equipment being provided.

On completion the personnel shall be fully conversant with the VSD equipment, and they shall be provided with copies of all necessary documentation, manuals and/or related software.

PE15.2 Site Training

The Contractor shall train the operating staff during the erection and commissioning periods to such a level where they can fully operate and maintain the system. Training shall include the following fields:

Control operator staff to level where they are fully conversant with the functions, equipment and operation of the system.

The operator staff shall be trained in the handling of emergency operations, simulated fault conditions and pump control procedures.

Technicians responsible for PLC's, and telemetry shall be trained to a level where they can independently run the software programmes, locate and rectify errors and do the alterations or extensions to the control system of the entire water supply installation.

On completion of the above training programme and after commissioning of the control system, the Contractor shall keep suitable staff available to aid with the operation and maintenance of the system by the operating staff.

All training programmes shall be submitted to the Engineer for approval at least one month prior to the commencement of site installation work. The Engineer and/or the Employer shall supervise all training.

The Contractor shall submit a weekly report to the Engineer on the progress made by the trainees.

PE15.3 Payment

All Employees will be remunerated by the Employer during training periods. Salaries and all the other expenses for the Contractor's staff shall be included in the tender prices.

The Contractor shall at no additional cost to the Employer provide all necessary documentation and training manuals required for the training of personnel. This shall include all equipment descriptions, wiring diagrams, programme listings, etc., required to fully describe the system.

The training costs shall be indicated in the Schedules.

PE 16 FIRE EXTINGUISHERS, FIRST AID KITS, DANGER SIGNS AND NOTICES

All danger signs and safety notices shall be in two of the official languages, operating notices, signs and labels that are not safety related need only be in English. Signs / notices with approved symbols may be used in the place of text signs.

Fire extinguishers shall be provided alongside the entrance

First aid kits shall be provided at the entrance/exit of the pump room at a position to be agreed with the Engineer. The kit will be in a metal first aid box, at an appropriately demarcated and sign posted first aid station, on a wall mounted shelf or other approved mounting.

"Burn shield” Dressings" shall be provided in each kit as follows:

- 4 off 100 x 100 mm,
- 2 off 200 x 200 mm.

PE 17 CERTIFICATE OF COMPLIANCE

On completion of an installation a Certificate of Compliance will be issued for the electrical installation as required by SANS 10142.

PE 18 OPERATING MANUALS

Three (3) copies of comprehensive operation and maintenance instructions in the form of hard covered manuals with a rear pocket enclosing prints of relevant “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 equipment in satisfactory running order;
- Instructions for the repair or replacement of worn or damaged parts;
- Schedules of routine testing of electrical equipment (as recommended by specific suppliers);
- Spare parts list;
- Particular technical data of equipment;
- Preference list, including local agents for the supply and repairs of specific equipment;
- All schematic wiring diagrams pertaining to technical equipment.

- As built CAD drawings of the switchboard construction, wiring diagrams and a functional description of the control of equipment served from the switchboard.
- As built drawings of all cables referred to permanent structures as reference point for measurement.

The Contractor shall in addition to supplying the above information, undertake to instruct departmental staff and satisfy himself that they are capable of operating all equipment when it has been commissioned.

THE CONTRACT
PART C3: SCOPE OF WORKS

Particular Specifications

Particular Specifications

Occupational Health and Safety Specification for Principal Contractors and Contractors for Construction Work

THE CONTRACT
PART C3: SCOPE OF WORKS

Particular Specifications

PORTION A

Occupational Health and Safety Specification for Principal Contractors and Contractors for Construction Work

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Appendices

Annexure:

A	Notification of Construction Work
B	Appointment Form [Example]
C	Recording and Investigation of Incidents
D	Agreement with Mandatories

1. Introduction

In terms of Construction Regulation 7 this document describes the health and safety specifications required for any principal contractor whom is making a bid for or whom has been appointed to perform construction work on behalf of the client. [Ref. CR 5(1)(a)]

- A principal contractor is required to compile their Health and Safety Plans based on these specifications detailed and referred to, in this document.
- In other words, the Health and Safety Plan must specify how the Principal Contractor will control and manage all health and safety aspects on the construction site.
- The Health and Safety Plan must be relevant to the construction work being carried out and if possible refer to the numbering system of this document.
- A principal contractor is to ensure that these specifications are communicated to all contractors under his/her agreement.

2.Reference Documents

The following documents are referred to:

2.1. Occupational Health and Safety Act, (Act No. 85 of 1993) - [OHSA] and Regulations.

a. The Construction Regulations 2014

b. Civil Drawings as below:

The following tender drawings (Working Drawings – Not for Construction) are bound with this document for use as a base of planning the project:

2.3 Compensation for Occupational Injury and Diseases Act – [COIDA]

3. Scope of Work

Detailed Description of work to be carried out

- Earthworks
- Excavations
- Work @ Height
- Pressure Testing
- Vehicle & Mobile Plant
- Concrete Works
- Support and Formwork
- Structures
- Electrical Works

List of plant, machinery and tools to be used during the project:

- Construction & Mobile Plants
- Hand Tools
- Portable Electrical Tools
- Ladders
- Further Information to be provided by contractor

List of Major hazards identified in the design risk assessments:

- Working at Heights
- Earth Works & Excavation
- Construction vehicles and Mobile plants
- Pouring Concrete
- Use of Power Tool
- Structures / False Work
- Shuttering
- Steel work

4. Definitions

The following definitions apply. (Abbreviations and legal references in brackets where applicable):

Construction Work

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

Hazard Identification, Risk Assessment and Risk Control (HIRA)
Means a documented plan, which identifies hazards, assesses the risks and detailing the control measures and safe working procedures, which are to be used to mitigate and control the occurrence of hazards and risks during construction or operation phases.

Site

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

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

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

Construction Supervisor [CR 8(7)]
Means a full time, competent employee appointed in writing by the Contractor to supervise construction work. The appointment, as required by the OHSA, shall stipulate health and safety responsibilities, area of responsibility and the proposed duration of the project.

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

Contractor
Means an employer who performs construction work and includes principal contractors and sub- contractors.

Health and Safety Plan (HSP)
Means a documented plan, which addresses hazards identified and includes safe work procedures to mitigate, reduce or control the hazards identified.
The plan shall be applied from the date of commencement of and for the duration of construction work.

Health and Safety File (HSF)
The file holding all documentation and records on health and safety for the project, which shall be available at all, times for evaluation, and a copy of which will be forwarded to the client upon completion of the project.

Disabling Injury Frequency Rate (DIFR)
The number of disabling injuries (DI"s) multiplied by a constant (man hours relative to period worked) divided by total man hours worked over a rolling period (usually 12 months, but can be less)

Disabling Injury Severity Rate (DISR)
The number of days lost due to DI"s multiplied by a constant (man hours relative to period worked) divided by total man hours worked over a rolling period (usually 12 months, but can be less)

Confined Space

An enclosed, restricted or limited space in which, because of it's construction, location or contents, or any work carried on therein, a hazardous substance may accumulate or an oxygen deficient atmosphere may occur, and includes any chamber, tunnel, pipe, pit, sewer, container, valve, machinery or object in which a dangerous liquid or dangerous concentration of gas, vapour, dust or fumes may be present

5. Responsibilities of Contractors for Construction Work

5.1. Notification of Intention to Commence with Construction Work

The principal contractor shall notify the Provincial Director of the Department of Labour before any work commences, in accordance with the following requirements:

- The demolition of a structure exceeding a height of 3 meters; or
- The use of explosives to perform construction work; or
- The dismantling of fixed plant at a height greater than 3 meters; or
- The work exceeds 30 days or will involve more than 300 person days of construction work; and
- Includes excavation work deeper than 1 meter; or
- Includes working at a height greater than 3 meters above ground or a landing.

The notification must be completed in the **Annexure A** form and a copy of the proof of fax or delivery to the Department of Labour to be kept in the Health and Safety File for inspection by an inspector, the client or an employee.

5.2. Principal Contractor's Responsibilities

- **Compile a Health and Safety Plan**
- **Ensure co-operation between all contractors to comply to the Act and the Regulations 2014**
- **Ensure compliance to the Act in terms of:**

a) Provide relevant sections of these specifications to contractors as required

b) Appoint each contractor in (a) above in writing. Only contractors who have the necessary competencies and resources may be appointed

c) Ensure each contractor's Health and Safety Plan is implemented and maintained on site

d) Stop any contractor from work which is not in accordance with Health and Safety Plan's or which pose a threat to health and safety of persons

e) Sufficient information is provided to contractors where there are changes to design and construction

f) Ensure every contractor is registered and in good standing with the Compensation Commissioner.

g) Ensure potential contractors have made provision for the cost of health and safety measures. Negotiate and approve the Health and Safety Plan of each contractor.

- All Health and Safety Files including the principal contractor's to be available on site.
- A consolidated Health and Safety File to be handed over to the client on completion of construction including records of drawings, designs etc.
- Health and Safety File to include updated list of all contractors, the agreements and their type of work.

5.3 Contractor's Responsibilities (including sub-contractors)

- Provide their Health and Safety Plan to the principal contractor.
- Where a contractor appoints another contractor (sub-contractor) it is the responsibility of that contractor to apply 4.2 above as if he were the principal contractor.
- No contractor to appoint another contractor (sub-contractor) unless the latter has the necessary competency and resources to perform the required work.
- To provide any information which affects the health and safety of any persons at work to the principal contractor.

5.4 Legal Appointments

The principal contractor shall ensure copies of the appointment letters of all responsible persons appointed on site will be kept in the Health and Safety File. All legal appointments shall be conducted in accordance with the requirements set out in the OHSA and as per this specification. The tables below set out the appointment protocols for CR and OHSACT. It should be noted that these represent a complete list and not all these appointments may be required:

Construction Regulations

Reg.	Appointment	Appointee	Competency Required
CR 7 (1)	Principal Contractor	16(2) for the company	Curriculum Vitae on file and Supervisor training (legal liability)
CR 5 (3b)	Contractor	Competent person	Proof of induction
CR 8 (1)	Contracts Manager	Competent Person	Certificate & CV
CR 8 (2)	Assistant Construction Manager	Competent Person	Certificate & CV
CR 8 (7)	Construction Supervisor	Competent person	Curriculum Vitae on file and Supervisor training (legal liability)
CR 8 (8)	Assistant Construction Supervisor	Competent person	Curriculum Vitae on file and Supervisor training (legal liability)
CR 8 (5)	Safety Officer	Competent person	Curriculum Vitae on file and SAMTRAC and registration with Professional Body
CR 9 (1)	Risk Assessor	Competent person	Curriculum Vitae on file and HIRA or similar
CR 10 (1)	Fall Protection Planner	Competent person	Curriculum Vitae on file and Fall Plan Developer
CR 12 (1)	Temporal Works	Competent person	Curriculum Vitae
CR 13 (1)	Excavation Work Inspector	Competent person	Curriculum Vitae on file and Supervisor training (legal liability)
CR 23 (1j)	Construction Vehicle Inspector	Competent person	
CR 23 (1d)	Construction Vehicle Operator	Competent person	Certificate of Competency for relevant construction vehicle
CR 28 (a)	Stacking and Storage Supervisor	Competent person	
CR 29 (h)	Fire Equipment Inspector	Competent person	
CR 29 (i)	Fire Team Members	Competent person	Fire Fighting Certificate

OHS Act

Reg.	Appointment	Appointee	Competency Required
OHSA 17 (1)	Health & Safety Rep	Nominated employee	Health and Safety Representative Certificate
OHSA 19 (1)	Health & Safety Committee Member	Management representative	Curriculum Vitae on file and Supervisor training (legal liability) and IRCON or similar
GAR 9 (2)	Incident Investigator	Competent person	Curriculum Vitae on file and RCAT or similar
GSR 3 (4)	First Aider	Competent person	First Aid Certificate
GSR 13	Ladder Inspector	Competent person	In house Training
DMR 18 (11)	Lifting Equipment Operator	Competent person	Code 1, 2, 3, 32, 33, 35 or 46
DMR 18 (5)	Lifting Equipment Inspector	Competent person	
	Hand Tools Inspector	Competent person	In house Training
	Pneumatic Tools Inspector	Competent person	In house Training
EMR 9(4)	Portable Electrical Equipment Inspector	Competent person	

The responsibilities of each appointment are detailed in the relevant form, which are signed by both the authorised person and the appointee and kept in the Health and Safety file. An example of an appointment form for a Construction Supervisor can be found under **Annexure B.**

5. Documentation and Procedures

All required documentation for the construction work, shall be kept in the Health and Safety File, which shall be available on site. The Construction Supervisor shall be responsible for the file on site and the Project Manager shall ensure that documentation is valid and up to date.
It is required that the documentation is filed in an orderly fashion for easy access. The following sections are suggested:

1. **Company insurances and information**
    - Letter of good standing
    - Public liability
    - Emergency contact numbers
    - Notification of construction work
    - Company organogram
    - Health and Safety policy
    - HIV & Aids Policy
    - Drug & Alcohol policy
    - Personal Protective Equipment Policy

2. **Health and safety plan and specifications**
3. **Appointments**
4. **Inspection registers and checklists**
5. **Risk assessments**
    - Risk matrix
    - Risk assessments
    - Method statements
    - Record of internal training
    - Review of risk assessments

6. **Safe work procedures**
    - Safe Working procedure training
    - Planned task observations
    - Emergency procedures
    - Fall protection plan
    - Permits to work

7. **Incident management**
    - WCL2 forms
    - Annexure 1 forms
    - Injury on duty reporting and investigation procedure
    - Resumption reports

8. **Training records and medical fitness certificates**
    - Certificates of formal training
    - Induction training records
    - Medical fitness certificates for all employees

9. Audits

- Client's Health and Safety audits
- Site inspection reports
- Site safety instructions

10. Contractor control

- List of contractor's and type of work
- Contractor appointments
- 37 (2) agreements

11. Health and safety communication

- Toolbox talks to be held weekly
- Health and Safety notice board
- Schedule D
- Memo's to employees

12. OHS Act and Regulations 2014

6. Application of COIDA and OHSA to Construction Work

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

Every contractor shall provide proof of registration and an updated letter of good standing with the Compensation Commissioner or a licensed compensation insurer.

6.2 Occupational Health and Safety Policy

- Every contractor's Occupational Health and Safety Policy statement should be available for scrutiny and as evidence of their commitment their employees' occupational health and safety and the environment.
- Every contractor's Occupational Health and Safety Policy statement is to be signed off by the Chief Executive Officer.
- Proof of communication to all is to be available on requests.

6.3 Health and Safety Training and Competency

Training of personnel is a necessity and a legal requirement when required. A record of all training shall be kept and provided on request.

6.3.1 Induction Training

- The principal contractor shall be responsible to co-ordinate all inductions on site to ensure that no contractor allows or permits any employee/s or person/s to enter any construction site , unless such employee, visitor or person has undergone induction training which is pertinent to the hazards prevalent on the site at the time of entry.
- Every employee, visitor or person on site shall be in possession of proof of the Health and Safety induction.
- Records of attendance shall be kept on the Health and Safety file for the duration of the contract.

6.3.2 Awareness Training

- Awareness training to be carried out weekly in the form of Toolbox Talks on relevant topics e.g. manual lifting, wearing PPE, safe use of portable electric tools etc.
- All attendees are to be made to sign an attendance register and such register is to be held on the Health and Safety file for the duration of the project.

6.3.3 Competency and CV's

- All supervisors and where applicable, valid copies of certificates of competency of appointed personnel to be provided and kept in the Health and Safety file. (Reference can be made to pages 10, 11 and 12 of this document).
- Other training requirements such as those identified through the High-risk Assessment process, to be completed and proof of that training also kept in the Health and Safety File.
- Where competency is achieved through experience, a brief CV will be required.

6.3.4 Specific OH&S training

- Valid certificates of training from registered service providers preferably accredited by the appropriate SETA are required for First Aiders, H&S reps, Fire Fighters etc.

6.3.5 Medical Fitness

- All work in elevated positions [tower crane operators, workers on elevated structures requiring fall protection, suspended platform workers and;
- Operators of construction vehicles and mobile plant require certificates of physical and psychological fitness carried out by an occupational medical practitioner.
- All employees who are employed in a construction site must have medical Fitness done by an Occupational Health & safety Practitioner before commencement of work.
- No employee will be allowed to perform any duties except deemed to be medical fit to do so.

6.4 Health and Safety Reps [OHSA 17 and 18]

- Where 20 or more employees are employed at a workplace, one health and safety representative shall be appointed in writing.
- The Principal Contractor shall ensure that a minimum of one health and safety representative is appointed for ratio of each 50 employees employed.
- Each health and safety representative shall be in possession of a certificate of competency.
- The employer is to ensure that a delegation process has been followed and recorded in term of the requirement of General Administrative Regulation 6
- Monthly checks are to be conducted by the appointed representatives in their designated areas and all finding are to be recorded in a register. Such register is to be held on the health and safety file for the duration of the project.
- Health and Safety Representative are to investigate any staff complaints and ensure that documented feedback is forwarded to the respective managers.

6.5 Health and Safety Committee [OHSA 19 and 20]

- Where two or more representatives have been appointed the employer shall ensure that a health and safety committee is formed.
- The number of management representatives shall not outweigh the number of representatives.
- Meetings shall be held at a minimum of three monthly.
- Minutes of such meeting shall be kept and place on the health and safety file for the duration of the project.
- A register of attendance is to be kept of attendees at such meetings; such a register is to be attached to the minutes.

6.6 General Record Keeping

All contractors shall ensure that all Health and Safety records, required by OHSA and Regulations are kept up to date for reference purposes and auditing.

6.6.1 Inspections

- All contractors shall keep all records of inspections undertaken during the duration of the project.
- An example of the total list of minimum legally required inspections can be found under **Annexure C**.
- An assessment list must be draft of what inspections are required and their frequency.
- The principal contractor is responsible to ensure compliance to this requirement by all contractors.

6.6.2 Audits

- The client's agent shall carry out regular audits on the principal contractor at least once per month.
- Principal contractors shall be responsible for carrying out regular audits on their contractors at least once per month
- The Principal contractor is to draft a table which reflects contractors company name, description of work, dates of audits and scores achieved.
- The results shall be tabled for action and discussed at the Health and Safety Committee meetings or the site meetings, as appropriate.

6.7 Incident management and emergency plans

- The principal contractor shall create an Emergency Plan for the construction site.
- The plan is to be clearly displayed in conspicuous locations around the site.
- The plan shall be clearly laid out for all types of emergencies including responsibilities, evacuation routes, siren, emergency no."s etc.
- The plan shall be fully explained to all personnel during the induction training.
- All contractors will become completely familiar with the requirements of the plan and will participate in any evacuation drills that may take place

6.7.1 First Aid [GSR 3]

- Where an employer has 5 or more employees in his employment, he/she shall ensure that at least one first aid box is made available in the workplace.
- Such first aid box is to be stocked covering the 18 items addressed in the Annexure attached to the General Safety Regulations as a minimum requirement.
- Where an employer has 10 employees or more in his/her employment, he/she shall ensure the at least one person readily available at the workplace whom is in possession of a valid first aid certificate.
- Every employer shall ensure that a minimum of one trained persons is made available for every 50 person in the workplace.
- All identified hazardous chemical are to have a material safety data sheet which is to be kept for first aid emergencies in the first aid box.
- All special needs addressed in the Material Safety Data Sheets are to be made available in addition to stock required in the Annexure.

6.7.2 Incidents and Injuries

Incidents

- A record of all incidents which have occurred shall be opened and held open until the handover of the project.
- All incidents such as near misses, unsafe situations, first aid injuries, etc shall be investigated fully and the result of such investigation shared with the Health and Safety Committee.
- The employer shall ensure that an investigation team is formulated which will consist of management representative, safety representative and an employee representative as a minimum requirement.
- All incidents that occur shall be filtered into a statistic format which is to determine the sites Incident Rate. Such rate is to be shared with all employees and all contractors on a monthly basis.
- Exclusion of incidents in record keeping shall result in fines being issued.

Injuries

- A first aid register is to be held in the first aid box as to record all first aid injuries that may occur.
- An injury on duty procedure is to be created which detail the process of treating an injured and methodology which may be use in order to ensure their safe arrival at a local hospital.
- All injuries are to be recorded in an Annexure 1

6.7.3 Accident and Incident Reporting and Investigation

Should an incident or accident investigation need to be conducted, the appointed incident investigator (competent person with a valid certificate of training on file) shall conduct the said investigation. The procedure to be followed will be in accordance with Annexure 1 of GAR 9 – “Recording and Investigation of incidents”. A copy of this annexure can be found under **Annexure D** in this document.
Particular attention is also drawn to OHSA 24, the reporting of certain incidents to an inspector of the Department of Labour.
The principal contractor shall ensure that the investigations are kept for record purposes and he shall ensure that the outcome of the investigation is communicated to all affected parties as required i.e. the client and contractors.
The client reserves the right to participate in all investigations into accidents or incidents and to conduct their own investigation if required.

6.8 Contractors and suppliers [OHSA 37(2)]

The client shall enter into an “Agreement with Mandatory” in terms of Section 37(2) of the Occupational Health and Safety Act, 85 of 1993, with all appointed principal contractors, a copy of which can be found under **Annexure B**. Likewise all principal contractors shall enter into a similar agreement with all contractors, sub-contracted to them for any period of the contract. Please note that if contractors hire any construction vehicles or mobile plant, the companies from which the equipment is hired must provide any maintenance and test certification as required. In addition, if operators are hired with the equipment, proof of competence and medical certification must be provided.

The principal contractor shall ensure that all contractors are issued with this safety specification where reasonably practicable including any contractor pack for the project, should they not be contained in the safety specification.

The principal contractor shall assist and ensure that contractors engaged comply with all of these requirements and adhere to the requirements set out in the OHSA. Contractors will be stopped from working in the event of unsafe conditions and activities being observed.
All contractors shall be subject to the requirements specified in the HSP and will be issued with a copy of the plan. If the contractor is not able to comply with the requirements set out in the plan, he shall not be appointed as contractor.

6.9 Personal Protective Equipment, Intoxication, Signage and Access Control [GSR 2]

6.9.1 Personal Protective Equipment (PPE) [GSR 2]

- The principal contractor shall through the Risk Assessment process identify all specific PPE needs per each activity. Such identified PPE shall be captured in the form of a PPE matrix and displayed in the site office. Such matrix is to make reference to the task and the specific PPE requirements required to do the task.
- All Contractors will be responsible for the issuing of the required PPE as identified by the matrix.
- Should PPE be lost or stolen, then the employee will be issued with new PPE.
- No person/s shall be permitted entry into the site unless they are properly equipped with the required PPE as identified in the matrix.
- Should PPE be worn out or damaged, the user shall return the worn or damaged PPE and will be issued with a replacement.
- Training in the use, care and limitation of such PPE is to be provided and proof of such training is to be held in the health and safety file.
- Visitors shall be informed of PPE requirements **prior** to their visit so that they may make necessary arrangements to ensure their arrival well equipped with the correct PPE.

6.9.2 Intoxication [GSR 2A]

The principal contractor shall be responsible to ensure that no persons may enter or remain at the construction site if under or apparently under the influence of intoxicating liquor or drugs. It may become necessary from time to time for contractors and their workers could be required to do a breathalyser test before entering the site.

6.9.3 Display of signs [GSR 2B]

The principal contractor should make use of signage to assist in enforcing compliance to any requirement specified in this document or as required by law. Standard symbolic signs are acceptable for conveying these requirements where applicable.

6.9.4 Access control [GSR 2C]

The principal contractor shall be responsible to ensure control of access to all persons entering the construction site. The reasons for this are as follows:

- The principal contractor is the „employer‟ on the site and for all intents and purposes is responsible for section 8 of OHSA for employees and contractors and section 9 for any other person on site such as visitors and inspectors
- All persons entering the site must undergo induction training to inform them of the hazards present on the site. This includes contractors, visitors, inspectors etc
- The construction supervisor will be aware of who is on site and their function
- The construction supervisor will be able to control tasks that may impact on other work being carried out on the site by a permit to work system
- The number of people and their purpose on the site must be known in case of emergency and evacuation security reasons

The principal contractor shall post conspicuous notices at the site informing all those entering the site of these requirements

6.10 Ladders [GSR 13A]

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

- A competent person shall be identified and appointed as the ladder inspector.
- Where aluminium ladders cannot be used, then wooden ladders shall be straight grained, unpainted to allow for proper inspection of the grain for cracking.
- Ladders shall be secured at the top and chocked at the base to prevent slipping.
- Where chocking of the base is not possible, then the user shall ensure that the ladder is held in position by another employee when ascending the ladder.
- No person is permitted to work longer that 15 minutes on a ladder. Should work take longer than 15 minutes to complete then alternative means of elevation is to be used.
- Ladders shall be inspected a minimum once per month and results recorded in a register by the person appointed as the ladder inspector.
- Proper storage shall be provided for all ladders when not in use.

6.11 Portable Electrical Tools [EMR 9]

This regulation shall be complied to as a minimum requirement. Regular inspections of all Portable Electrical Tools such as drills, angle grinders etc, shall be carried out. In particular:

- Only trained personnel shall operate such equipment.
- The Construction Supervisor shall ensure operation of the equipment is in accordance the HRA requirements and Safe Working Procedure (SWP).
- All users shall undergo regular awareness training (toolbox talk) to ensure compliance.
- The Construction Supervisor shall ensure the required PPE is used.

6.12 Permit to work

The permit holder shall be responsible to ensure that:

- All work being carried out on the site has been approved through the necessary project control system
- All work is being done in compliance with the issued permits.
- Permits required from third parties such as town councils for utility and water services are in place
- A permit system is operational so that work consisting of many tasks related to the construction on site, can be carried out without endangering the health and safety of personnel on site, neighbours and the public surrounding the site and/or causing damage to property.
- In particular, attention is drawn to GSR 9, which details the requirements for welding, flame cutting, soldering and similar operations (hot work)

6.13 Work in confined spaces

The permit holder shall be responsible to ensure that:

- All work being carried out on the site has been approved the necessary project control system
- All work is being done in compliance with the issued permits.
- Permits required from third parties such as town councils for utility and water services are in place

7. Application of the Construction Regulations [CR]

[Please note: this is not the complete list. Item 7.1 is compulsory and the rest are applicable if relevant to the work being carried out]

7.1 Hazard Identification, Risk Assessment and Risk Control (HIRA) [CR 9]

- The contractor shall prior to the commencement of any construction work perform a HIRA exercise, which will form part of the HSP for the project.
- A copy of the HIRA shall be made available for viewing to the client's agent and shall be kept in the Health and Safety File.
- The contractor shall ensure that the outcome of all HIRA exercises will be conveyed to all relevant employees with respect to the hazards and the related control measures before any work commences.

The control of several of these risks may be specified in the OHSA does not mean that the HIRA exercise does not have to be carried out.

6.2 Fall Protection [CR 10]

Section 1 (a)of this regulation states that a contractor shall cause the designation of a competent person, responsible for the preparation of a fall protection plan. The control of several of these risks may be specified in the OHSA or the CR but this does not mean that the HIRA exercise does not have to be carried out.

6.3 Structures [CR 11]

The appointed civil contractor shall meet the requirements of this regulation. Attention is drawn, which requires the designer to inspect the structure at appropriate times and the record of these inspections to be available on site.

6.4 Excavations [CR 13]

Section 1 of this regulation states that this work must be carried out under the supervision of a competent person who has been appointed in writing. All the requirements of CR 13 shall be met. For inspection of excavations, attention is drawn to section 3 (h), the records of which must be available on site.

6.5 Construction vehicles and mobile plant [CR 23]

It will be the responsibility of each contractor on site to ensure compliance of their vehicles and mobile plant to these regulations. This includes vehicles to be used for transporting personnel to and from site, which will be subject to relevant requirements such as licensing and roadworthiness checks. In addition the following will apply:

- Safe transport for personnel working on the project to and from the workplace, which shall include proper seating, side restraints and cover.
- Road safety principles shall be adhered to on and off staff.

If a mobile crane or other mobile plant is hired, only approved hire companies shall be contracted to provide such equipment. The Construction Supervisor shall ensure compliance of the provider to these regulations. In particular, attention is drawn to the competence and fitness of the operator [section 1 (d)] and the inspection of the equipment [section 1 (j)]

6.6 Temporal Electrical installations[CR 24], including [EIR] and [EMR]

The requirements of these regulations shall be met as required, by the appointed electrical contractor. A competent person will be appointed for inspection and control of all temporary electrical installations as per CR 24 (d) and (e) respectively.

6.7 Water Environments [CR 26]

The requirements of this regulation shall be met.

6.8 Housekeeping [CR 27] including [ERW(6)]

All contractors shall ensure that housekeeping standards as per these regulations shall be maintained at all times.

6.9 Stacking of Materials [CR 28] including [GSR (8)]

All contractors shall ensure that materials are only stored in defined and allocated storage areas and that materials being stored are stacked in accordance with sound stacking principles as per these regulations.

6.10 Fire Precautions [CR 29]

All contractors on site will comply fully with the requirements of this regulation. In particular, the principal contractor will be responsible for the evacuation plan (section (l)) the details of which will be imparted to contractors, visitors etc through the site induction.

6.11 Construction welfare facilities [CR 230]

The principal contractors shall be responsible for implementing this regulation and shall ensure that adequate facilities are provided for the personnel on site in terms of the following:

- Change room facilities
- Sheltered eating area
- Adequate toilets
- Hand wash facility
- Potable water.

No food preparation shall be conducted on site. Eating and drinking will only be permitted in the designated eating areas, which must be provided with adequate seating. Waste bins shall be strategically placed and clearly regularly.

8 Site-specific and Design Risks

Please note: this is not a complete or exhaustive list. The principal contractor is expected to assess all risks to which his employees may be exposed during the construction and/or demolition process, as well as the hazards identified and listed below.

The following jobs or activities are classified as High

- Confined Space Entry
- Excavation
- Construction vehicles and mobile plant
- Traffic accommodation
- Pouring Concrete
- Working at Heights

8.1 Hazard Identification and Risk Assessment Methodology

8.1.1 Baseline Risk Assessment

A Baseline Hazard Identification and Risk Assessment must be carried out during the preliminary stages of the construction/demolition project for the purposes of attempting to reduce the possibility of accidents or ill health occurring.

Taking into account the constraints of time and resources, every effort must be made to identify the hazards and recommend possible solutions. It is not reasonably practicable to expect the baseline risk assessment to identify all hazards, which is why task risk assessments are carried out on site.

8.1.2 Task risk assessment

Once on site, every contractor shall perform task risk assessments, using the baseline risk assessment as a guide.

The Risk Assessment should be reviewed once on site and thereafter after any incident or every one-year period, whichever occurs first. Additional hazards highlighted or a change in the risk factor should have a separate risk assessment carried out and filed.

The Risk Assessment is based on the combination of the CONSEQUENCE and PROBABILITY associated with each hazard.

8.1.3 Definitions

Term	***Meaning***
HAZARD:	Anything that can cause harm
RISK:	The chance, great or small, that someone will be harmed by the hazard
CONSEQUENCE:	The possible outcome of an accident / incident, e.g. broken leg, explosion
PROBABILITY:	The possibility of the accident / incident occurring

8.1.4 Risk assessment

The following evaluation must be used to determine risk:
Probability X Consequence = RISK

Risk Matrix:

Risk Matrix:

RED = High Risk (6 – 9)
ORANGE = Medium Risk (3 – 4)
GREEN = Low Risk (1 – 2)

	(3) Critical (Fatal/Permanent Disabling Injury)	**(3) Medium risk**	**(6) High risk**	**(9) CRITICAL**
	(2) Major (Temporary Disabling Injury)	**(2) Low risk**	**(4) Medium risk**	**(6) High risk**
	(1) Manageable (Minor/first aid)	**(1) Low risk**	**(2) Low risk**	**(3) Medium risk**
		(1) Remote (<10%)	**(2) Possible** (10-50%)	**(3) Likely** (>50%)
		Probability (Likelihood)		

Activity	**Hazard**	**Risk Eval.**	**Precautions and Control Measures** *1. Eliminate the risk* *2. Control the risk at its source* *3. Follow a safe working procedure* *4. Provide PPE*
1.Describe task	Hazard 1	9, 6, 4, 3, 2, or 1	• Precaution 1 • Precaution 2 • Etc.
	Hazard 2		• Precaution 1 • Precaution 2 • Etc.

8.2 Site-specific risks

The following site-specific risks have been identified for this project. These must be catered for in the contractor's health and safety plan (that which is applicable to their scope of work), and included in the site-specific risk assessment:

8.2.1 Traffic – restrictions, existing systems, site traffic
Traffic accommodation must be arranged with the principal agent.

8.2.2 Site security and access –
This is controlled by the individual contractor responsible.

8.3 Design risks
The following design risks have been identified by the designer for this project. These must be catered for in the contractor's health and safety plan (that which is applicable to their scope of work), and included in the site-specific risk assessment:

8.3.1 Excavations
8.3.2 Traffic Accommodation
8.3.3 Vehicle and mobile plants

9 Fines and Penalties

9.1 Minor Health or Safety Transgression
Not wearing PPE; e.g. safety helmet, eye protection, high visibility vests or foot protection. Fine: R1000-00 will be issued to the contractor.

9.2 Serious Health or Safety Transgression
Not contributing to good housekeeping practices, improper stacking and storage, lack of supervision on site, failure to carry out risk assessments for tasks or activities, failure to carry out toolbox talks, failure to train employees in risk assessments and/or safe work procedures, failure to issue PPE to employees. Fine: R2000-00 will be issued to the contractor

9.3 Major Health or Safety Transgression
A life-threatening activity, condition, act or contribution by an employee in creating an unsafe working environment for himself or herself or other persons, failure to wear critical PPE (safety harness, eye protection, respiratory equipment, or as stipulated in the risk assessment).
Fine: Up to R3000.00 will be issued to the contractor

9.4 Repeat Offences
A contractor that receives more than three (3) major transgressions for the same offence and may, at the discretion of the project manager, be required to leave site

ANNEXURE A (Notification of Intention to Commence Construction Work)

NOTIFICATION OF CONSTRUCTION WORK
Regulation 4 of the Construction Regulations, 2014

1. (a) Name and postal address of principal contractor:
   (b) Name and telephone number of principal contractor's contact person:

2. Principal contractor's compensation registration number:

3. (a) Name and postal address of client:
   (b) Name and telephone number of client's contact person or agent:

4. (a) Name and postal address of designer(s) for the project:
   (b) Name and telephone number of designer's contact person:

5. Name and telephone number of principal contractor's construction manager on site appointed in terms of regulation 8(1):

6. Name/s of principal contractor's sub-ordinate manager on site appointed in terms of regulation 8(2):

7. Exact physical address of the construction site or site office:

8. Nature of the construction work:

9. Expected commencement date:

10. Expected completion date:

    1. Estimated maximum number of persons on the construction site:
       Total _____ Male _____ Female _____

12. Planned number of contractors on the construction site accountable to principle contractor:

13. Name(s) of contractors already chosen:

_____ _____
Principal contractor Date

_____ _____
Client Date

ANNEXURE B (Example: Appointment - Construction Supervisor)

APPOINTMENT OF A CONSTRUCTION MANAGER

CONSTRUCTION REGULATION 8 (1)

8(1) The contractor shall appoint a full time, competent employee in writing as the construction supervisor with the duty of supervising construction work

APPOINTMENT

I,_____ (contractor's name), having been appointed in terms of section 16 (2) of the Occupational Health and Safety Act (85 of 1993) to ensure full compliance with the Act, do hereby appoint:

_____ (name of appointee), being a full-time employee, as the **Construction Manager** responsible for:

_____ (site address)
,to supervise construction work for the duration of the project/ contract or until you are relocated to another site/ project or leave the employ of the company.

You are reminded that you are required to be conversant with all relevant statutory provisions and regulations of the Occupational Health and Safety Act (85 of 1993) in the regard to carrying out of construction work.

Signature_____ Date _____

Designation_____

ACCEPTANCE

I, _____ (name of appointee)
hereby accept and understand the requirements of this appointment as **Construction Manager** and confirm that I have the necessary competence required and that I am conversant with all the relevant statutory provisions of the Occupational Health and Safety Act (85 of 1993).

Signature_____ Date _____

Designation_____

Certificate(s)
Training &CV_____

ANNEXURE C Inspection List

Inspections Required

No.	Inspection	By who	Frequency	Record
1	Excavations	Appointed Person	Daily before shift, plus other	Checklist
2	Construction Vehicles and Mobile Plant	Appointed Person	Daily	Inventory/ checklist
3	Electrical Installations (temporary)	Appointed Person	Weekly	Inventory/ checklist
4	Fire Equipment	Appointed Person	Manufacturer's spec	Inventory/ checklist
5	First Aid Box Contents	First Aider	Monthly	Inventory
6	Ladders	Competent Person	Monthly	Inventory/ checklist
7	Lifting Tackle	Appointed Person	3- monthly	Inventory/ checklist
8	Hand Tools	Appointed Person	Monthly	Inventory/ checklist
9	Portable Electrical Equipment	Appointed Person	Monthly	Inventory/ checklist
10	Health & Safety Rep	H&S Rep/ Safety Officer	Monthly	Checklist
11	Good Housekeeping	H&S Rep/ Safety Officer	Monthly	Report
12	Stacking and Storage	Appointed Person	Monthly	Report
13	Change Rooms and Toilets	H&S Rep/ Safety Officer	Monthly	Inventory/ checklist
14	Pneumatic Tools	Appointed Person	Monthly	Inventory/ checklist

ANNEXURE D (Recording and Investigation of Incidents)

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993
(ACT NO 85 OF 1993)
REGULATION 9 OF THE GENERAL ADMINSITRATIVE REGULATIONS
RECORDING AND INVESTIGATION OF INCIDENTS

A. RECORDING OF INCIDENT

1. Name of Employer _____
2. Name of affected person _____
3. Identity Number of affected person _____
4. Date of incident _____ 5. Time of Incident_____

6. Part of the body affected*
7. Effect on the person. *
8. Expected period of disablement.*

Head or neck	Eye	Trunk	Finger	Head	
Arm	Foot	Leg	Internal	Multiple	
Sprains or strains	Contusions or wounds	Fractures	Burns	Amputation	
Electric Shock	Asphyxiation	Unconsciousness	Poisoning	Occupational Diseases	
0-13 days	2-4 weeks	>4-16 weeks	>16-52 weeks	>52 weeks or permanent disablement	Killed

9. Description of Occupational disease** _____

10. Machine/ process involved/ type of work performed/ exposure*_____

_____

_____

_____

11. Was the incident reported to the Compensation Commissioner and Provincial Director?

Yes	No

Make a cross in the appropriate square

12. Was the incident reported to the Police?

Yes	No

13. SAPS office and reference _____

- *To be completed in case of a fatal incident
- **in case of a hazardous chemical substance, indicate substance exposed to.

B. INVESTIGATION OF THE ABOVE INCIDENT BY A PERSON DESIGNATED THERETO

1 Name of investigator _____ 2 Date of investigation_____

3 Designation of investigator _____

ANNEXURE E (Section 37(2) – Agreement with Mandatory)

AGREEMENT WITH MANDATORY

OCCUPATIONAL HEALTH AND SAFETY ACT, (Act No 85 of 1993)

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

WRITTEN AGREEMENT ENTERED INTO AND BETWEEN

(Hereinafter referred to as the Company) AND

CONTRACTOR

(Hereinafter referred to as The Contractor)

Compensation Fund Number:

AGREEMENT WITH MANDATORY TO BE COMPLETED IN BLACK INK. INITIAL EACH PAGE AND ANY CHANGES.

Definition of MANDATORY

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

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

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

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

3. You are required to:

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

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

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

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

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

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

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

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

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

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

3.10 When using Explosive Powered Tools, comply with Construction Regulation19.

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

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

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

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

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

5. You are required to comply with General Safety Regulation 2(1) to (7) and provide employees with: personal protective equipment which will allow them to carry out their work in a safe manner, e.g. hard hats, safety belts, gloves, safe footwear, eye protection, ear protection, waterproof clothing etc.

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

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

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

The requirements of this clause do not relieve the Contractor of any obligations as detailed under the General Conditions of Contract or the Special Conditions of Contract.

THE CONTRACT
PART C3: SCOPE OF WORKS

Particular Specifications

PORTION B

Occupational Health and Safety Specification for Principal Contractors and Contractors for Construction Work - COVID 19

COVID 19 ADDITONAL HEALTH AND SAFETY SPECIFICATIONS

South Africa's state of national disaster can remain in force as long as Parliament is willing to renew it, and under it the executive branch of the government has the power to make such rules as it deems necessary to save lives. But even after the state of disaster ends, existing laws and regulations on workplace safety, preventing communicable disease can be used to enforce measures to slow the spread of the novel coronavirus.

1. HOW CAN WE PREVENT INFECTION?

The following can provide protection against infection from Coronaviruses and many other viruses that are more common in South Africa:

- Wash your hands often with soap and water for at least 20 seconds. If soap and water are not available, use an alcohol-based hand sanitiser.
- Avoid touching your eyes, nose, and mouth with unwashed hands.
- Avoid close contact with people who are sick.
- Stay at home when you are sick and try and keep a distance from others at home.
- Cover your cough or sneeze with a flexed elbow or a tissue, then throw the tissue in the bin.
- Clean and disinfect frequently touched objects and surfaces.

These are some of the rules and regulations that should be adopting after the hard Covid-19 lockdown ends.

2. TAKING STAFF TEMPERATURES, AND KEEPING A LOG OF VISITORS

Clients, Staff and visitors will be required to check every person who enters premises, staff and visitors alike, for fever. (An elevated temperature is one of the early signs of Covid-19.) We will be required to keep a log detailing when everyone comes and goes, to make for easier tracing of contacts in the event that one of those people tests positive for SARS-CoV-19 later.

3. AT LEAST 1.5 METRES OF SPACE BETWEEN EACH WORKSTATION – AND EVERYWHERE ELSE

- The standard for the distance between people seems to have settled down to 1.5 metres which will be adopted.
- That is the distance likely to be required between workstations in offices, and also in settings such as meeting rooms.
- Some sectors have argued they simply cannot maintain such distances, for instance on

Construction sites, but they may have to explain that to labour inspectors empowered to investigate unsafe working conditions.

4. A CLEAR PLAN ON WHAT TO DO IF SOMEONE SHOWS SYMPTOMS WHILE AT WORK

Workplace safety policies and procedures will be updated on what happens if someone starts showing symptoms of Covid-19, such as a cough or fever, including:

- The responsibility of managers to detect such symptoms and take appropriate action.
- Where personal protective equipment is kept, for use by colleagues assisting the ill person.
- Where an ill person can be isolated from everyone else.
- How the immediate workspace used by an ill person will be sanitised.

See also: South Africa is getting a special three-digit phone number for Covid-19 emergencies

5. STOPPING THE SHARING OF HARDWARE, OR SANITISING PROTOCOLS BETWEEN USERS

Shared computer keyboards or phones in offices, and shared tools in our engineering context is strongly discouraged.
Where equipment is unavoidably in common use, that hardware will have to be sanitised between uses, with employees being held responsible for sanitising both and before each use.

6. EDUCATION ON COUGHING, HAND WASHING, AND OTHER PERSONAL MEASURES

Companies are expected to have a specific obligation to educate workers on measures to slow the spread of viral infection, including coughing into the crook of the elbow and washing hands regularly for at least 20 seconds. Refer to Item No.1 for additional measures.

7. LOTS AND LOTS AND LOTS OF DISINFECTANT

Because environments may differ from office to office, we will be expected to:

- Provide hand-sanitising stations, or better yet soap and water, at entry points.
- Ensure the constant and uninterrupted availability of soap and running water in bathrooms.
- Add sanitising agents to cleaning routines, using the likes of bleach or alcohol-based sanitizers (minimum 60% Alcohol Content) to clean everything from laptops and stand-alone machines (keyboards and screen), mouses, desks and other items in constant contact, at least once every hour.

8. CLOTH MASKS AND GLOVES

South Africa's policy of encouraging the wearing of masks (reusable cloth ones rather than the medical equipment in desperate short supply in the health care environment) may have a firmer incarnation in workplace rules after the hard lockdown ends.

Customer-facing businesses like ours, would require us to have visors, masks, or plastic partitions between staff and customers. There is also some debate on requiring mask wearing in office environments, for the duration of South Africa's traditional winter flu season. We would recommend that all staff adhere to this rule post lockdown and for the foreseeable future, until such time that the epidemic has been contained.

Gloves, however, do not feature prominently South Africa's policy; other than keeping gloves around for special use, such as in dealing with an ill colleague. However, we will be adopting a rule where every employee must wear gloves to limit the possible spread of the virus.

9. CONSTRUCTION SITES

The Protocols below will apply at all times where a main Contractor is responsible for Capital Works, Maintenance Works or EPWP Projects. Save for the possibility that the site may not be fenced off as in the case of a traditional site, all OHS Act responsibilities remain together with COVID 19 Health and Safety Measures which should be conducted at the meeting or assembly points generally required for employees and sub-contractors performing Maintenance or EPWP type work.

HAZARD AND RISK CONTROLS

Resumption of operations

- The Security will record the reading of the temperatures taken for individuals. Persons performing these duties shall wear masks at all times whilst doing so.
- Security taking temperature readings will use a clipboard and disposable pens – only receptionist will record the readings of temperature readings at access points
- If temperature is above 37º, wait 5 minutes and retake temperature. If temperature is above 37.3º do not allow access, report to management for further action
- Take every person's temperature entering the premises
- Ensure queue control at access points – stand 2m apart from each other
- Management to conduct COVID-19 induction screening and awareness program, together with PPE training before allowing employees to proceed to their workstations
- Allocate hand sanitizer stations at access points – every person must sanitise their hands prior entering the premises
- Each person entering the premises will be required to sign the COVID-19 declaration and assessment form
- Conduct COVID-19 induction program
- Issue all employees with additional PPE
- Face masks.
- PPE aligned to risk

Premises access control

- All other safety monitoring equipment employed such as alcometers etc. shall be the contactless type or be fitted with disposable mouthpieces. Such equipment shall be sanitized after every use.
- Security will ensure that non-essential visitors are not allowed access to a construction site.
- Contractors will monitor site access points to enable social distancing – contractors may need to change the number of access points, either increase to reduce congestion or decrease to enable monitoring.
- Allow plenty of space (two metres) between people waiting to enter site.
- Remove or disable entry systems that require skin contact e.g. fingerprint scanners or biometric system.

Food handling processes and canteen service

- Management must ensure that different lunch and teatime breaks allocated – to minimise the amount of people accessing canteen areas at a time. Social distancing must be enforced at all times
- Measure and monitor the implementation of the requirements for canteen service providers
- Canteen areas will be disinfected at least twice a day
- Canteen service provider must provide management with a detailed awareness and training, health and hygiene program
- Disinfecting stations must be allocated cash points
- Food service staff must be issued with masks and disposable surgical gloves
- Self-service food stations must not be allowed
- Employees will not be permitted to buy food outside of the premises during working hours and shall bring their own lunch if they do not plan to use the canteen facilities
- Break times should always be staggered to reduce congestion and contact.
- Workers should sit 2 metres apart from each other whilst eating and avoid all contact.
- Disposable plates and cutleries must be used at all times.
- Workers should be asked to bring pre-prepared meals and refillable drinking bottles from home to the extent possible.
- All rubbish should be put straight in the bin by each user.
- All areas used for eating must be thoroughly cleaned at the end of each break and shift, including chairs, door handles, vending machines and payment devices.

Employees required to travel

- Employees
- Delivery Staff
- Critical business travel (locally)

  - Employees using public transport to commute between home and work are to adhere to the strict rules determined for such travel by the Minister of Transport. Such employees shall be issued with masks by the employer as well as hand sanitiser that will be used according to the training provided at the place of employment.
  - In the event that the employer provides transport, this will be done in accordance with the same regulations that apply to that for public transport providers.
  - Employees using company vehicles shall be limited to two per bakkie and 3 per sedan. Employees exceeding one in number shall use masks when travelling in company vehicles.
  - Hand sanitiser shall be provided for each company vehicle.
  - Communication plans such as skype, Zoom, Telephone conferences, WhatsApp video calls or Google workplace video calls will be used to limit the amount of business travel requirements
  - Delivery staff and truck drivers will be issued with hand sanitisers – this must be kept in their vehicle
  - Non-alcoholic swabs will be issued to truck drivers in the event of testing requested by clients
  - Truck drivers shall declare any symptoms that might be linked to the COVID-19 virus to management

- Trucks will be decontaminated after deliveries and at the end of each shift – decontamination can be done with soap and water
- Drivers will be scanned by security with infrared temperature devices every time they enter the premises
- In the event that critical business is required for local traveling via flights – this will only be done by approval of the CEO. A traveling kit will be provided to the individual for business-critical travel upon approval When such individuals return, his/her symptoms shall be monitored daily for 14 days. In the event where the individual shows any symptoms of COIVD-19 he/she will self-isolate for 14 days
- International traveling will not be allowed, until further notice (Outside the borders of South Africa).
- If you were exposed to a person who travelled internationally. You will be required to self-isolate for 14 days. Suppliers, customers and sub-contractors.
- Management will make a decision on what level of interaction is required and limit access to premises for work purposes.
- Site premises shall be entered for emergency maintenance of equipment when a Contractor/Service provider needs to access equipment on site requiring attention or when a supplier of materials is required to access the premises. Premises access control measures shall apply in these cases
- Sub-contractors that are on site full time will be required to comply with all protocols as those that are applicable to employees
- Management will communicate the Company emergency response plans to clients, suppliers and service providers
- The aim is to maintain a relationship and understanding of the benefits of the implemented mitigation
- Limit sites visits and face to face to meetings
- Meetings to be held via Skype, Zoom, Conference calls or other Similar means
- Where critical business meetings are required, the premises access control measures shall apply in these cases

Workplace hygiene

- Rest room facilities will be limited as a measure of control to ensure that facilities are effectively disinfected
- Rest room facilities will be disinfected at least twice a day
- Office environments will be disinfected at least twice a day – this includes offices, meetings rooms, staircase handrails, doorknobs and lift buttons
- Hand disinfecting stations will be provided at every entrance into the building including rest room facilities
- Workplace stations will be disinfected with soap and water after every tea and lunch break
- Any touch system computerised screen will be disinfected with a 60% alcohol-based sanitiser
- Changeroom and washroom facilities for employees will be disinfected at least twice a day.
- Employees will always be required to place personal belongings in personal lockers provided in change rooms
- Workplace stations in production areas will be disinfected at least twice a day.
- Parental control (Applicable to Office Based Staff Only on Sites)
- Employees will not be allowed to bring their children to work during the closure of schools.
- Employees will not be allowed to bring their child to work in the event of any ill health effects or symptoms The parent of such a child must report the matter to HR and management
- The parent must make other arrangement to accommodate the child
- In the event where no arrangements can be made, the parent must consult with HR regarding the relevant leave policy specifically aligned to the COVID-19 disaster management plan
- Employees may also elect to work from home if they have the requisite equipment and facilities in the absence of any childcare services being available

- Awareness and training programs
- Only internal programs of this nature will be allowed and limited to small groups of no more than 15 people per session.
- People must stand or sit at least 2m apart from each other
- The area will be well ventilated and must have enough space for the purpose of awareness programs
- Hand sanitisers must be available in the area and people must wear masks
- Where tables and chairs are used for such sessions, these shall be disinfected after every session.
- Technical/Site/Quarterly Meetings
- Office meetings will be kept to a limit of 4 people at a time
- People must sit at least 2m apart from each other
- Hand sanitisers must be available in during the meeting
- Office tables and chairs will be disinfected after every meeting.

PART C4 : SITE INFORMATION

Part C4: Site Information

C4.1 Nature of Ground

The ground profile across the site comprises of Silty sands and Silty Clayey Sands. Silty sands together dominate the subsoil profile across the site. From the surface occurs Slightly moist, light to dark brown, loose to very soft, residual/intact Silty Sands with fine roots, weathered sandstones and shale are visible on the profiles.

C4.2 Spoil Material

No indiscriminate spoiling of material will be allowed. All unsuitable or surplus material shall be spoiled off site to a spoil site/municipal dump, chosen by the Contractor.

C4.3 Finishing – off the Site

The site shall be finished-off in accordance with the specifications as well as to the requirements of all applicable environmental standards.

C4.4 Existing Services

Although every effort has been made to depict existing services (water mains, electric cables, telephone cables etc.), as accurately as possible on the contract drawings, insofar as they are known, variations do arise and the Contractor shall exercise extreme care when working in the area. Items have been allowed in the Schedule of Quantities for dealing with and protecting services.

The Contractor shall take whatever precautions are required to protect these services from damage during the period of the Contract.

C4.5 Proving of Underground Services

It is stressed that all services in a particular area must be proven before commencing work in that area.

Insofar as bulk earthworks are concerned, where services are indicated on the drawings or where from site observations can reasonably be expected that such services are likely to exist where excavations are to take place, the Contractor shall without instructions from the Engineer carefully excavate by hand to expose and prove their positions.

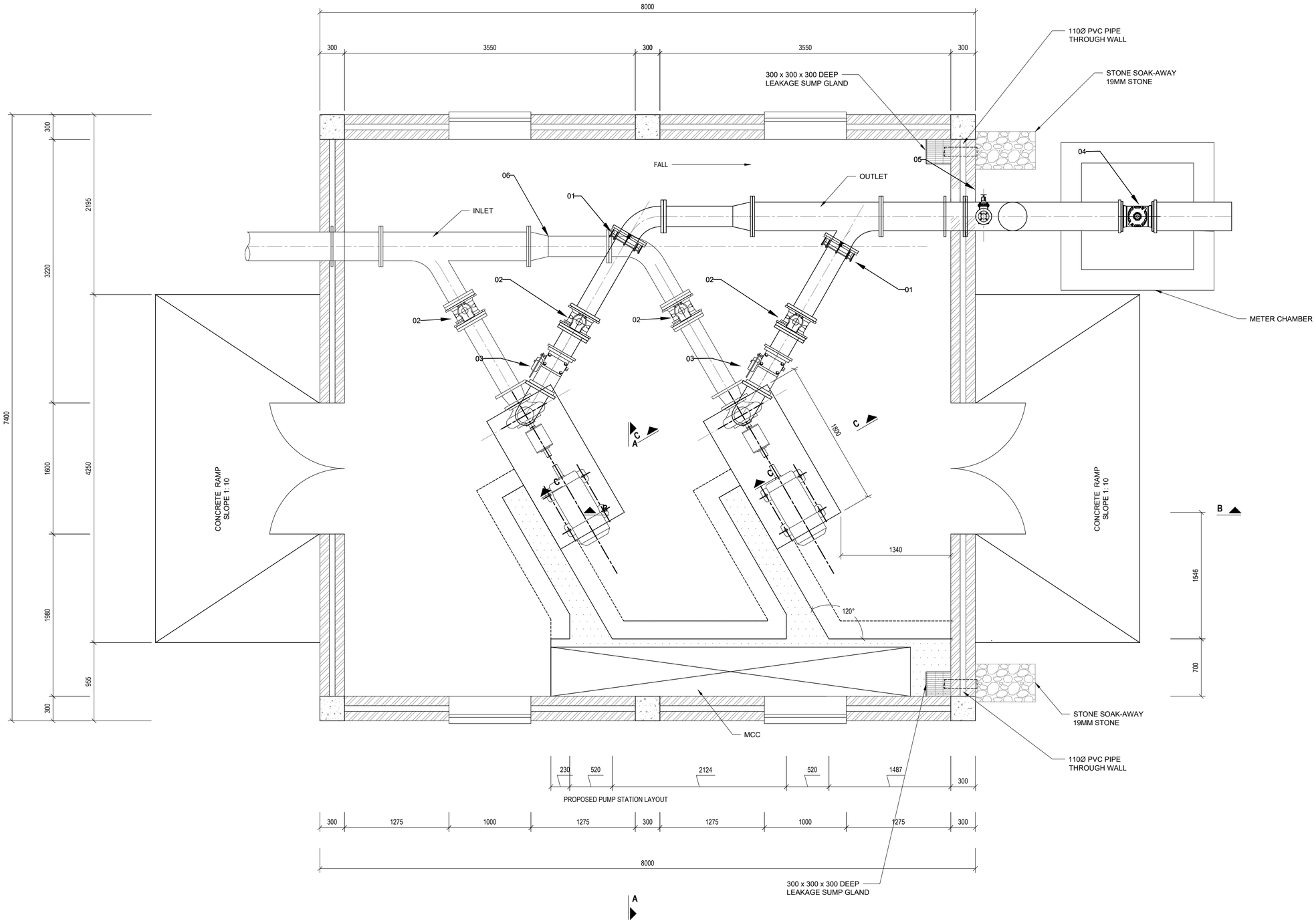
When a service is not located in its expected position the Contractor shall immediately report such circumstances to the Engineer who will decide what further searching or other necessary action is to be carried out and shall instruct the Contractor accordingly.

Should any service be damaged by the Contractor in carrying out the works, and should it be found that the procedure laid down in this clause has not been followed than all costs in connection with the repair of service will be to the Contractors account.

Proving of services shall be completed at least two weeks in advance of the actual programmed date for commencing work in the area. The position of these services located must be co-ordinated and levelled by the Contractor, and the information given in writing to the Engineer’s representative.

ANNEXURES

Annexure A: Book of Tender Drawings



FLOOR PLAN

SCALE 1:25

NOTES:

CLIENT:

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ENGINEER:

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E-mail : info@kufanikiwa.co.za

Website Link or Address : www.kufanikiwa.co.za

DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO
SILOBELA, EXTENTION 5

DRAWING TITLE:

MECHANICAL
PUMPSTATION FLOOR
PLAN

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	K JAGARNATH (Pr Tech Eng)	
DRAWN	A SHANGASE	
CHECKED	K JAGARNATH (Pr Tech Eng)	
APPROVED		
SCALE	AS SHOWN	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	M101

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TENDER	A1	1 of 1	00

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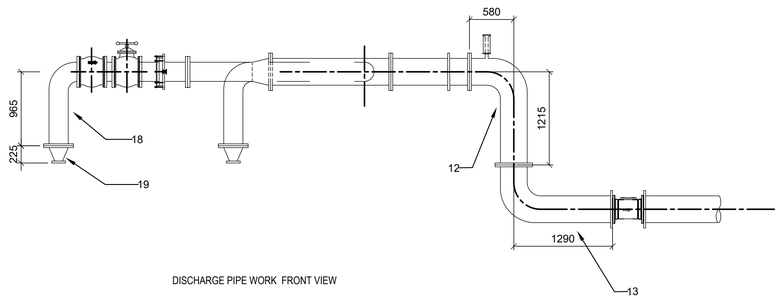
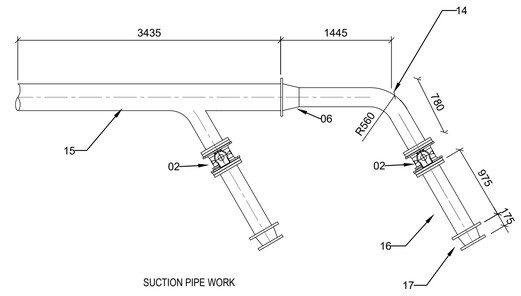
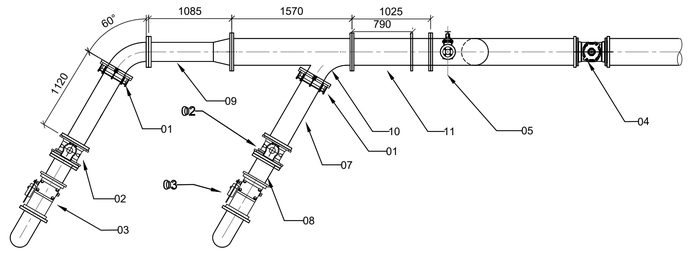


DISCHARGE PIPE WORK FRONT VIEW



SUCTION PIPE WORK



DISCHARGE PIPE WORK TOP VIEW

SCHEDULE OF FITTINGS

ITEM No.	DESCRIPTION	QTY
1	VJ COUPLING	2 No.
2	250 DIA FLANGED ISOLATION VALVE PN16	2 No.
3	250 DIA FLANGED NON-RETURN VALVE PN16	2 No.
4	KENT HELIX FLANGED WATER METER	2 No.
5	150 DIA AIR VALVE PN16 COMPLETE	2 No.
6	355 x 250 RILSAN COATED AND LINED MILD STEEL FLANGED REDUCER	2 No.
7	DN250, 1120 LONG PIPE, FOE	2 No.
8	DN250, 290mm LONG PIECE, FBE	2 No.
9	DN250, 1085mm LONG PIPE WITH DN350/DN250 REDUCER, FBE	1 No.
10	DN350, 1570mm LONG PIPE WITH 60 DEGREE, DN250 CONFLUENCE PIECE, FLANGED ALL ENDS	1 No.
11	DN350, 1025mm LONG FLANGED SPOOL PIPE, FBE	1 No.
12	DN350, 1215/580mm LONG WITH 90 DEGREE BEND, FBE	1 No.
13	DN350, 1290/580mm LONG PIPE WITH 90 DEGREE BEND, FBE	1 No.
14	DN250, 1445/780mm LONG PIPE WITH 60 DEGREE BEND, FBE	1 No.
15	DN350, 3435mm LONG PIPE WITH 60 DEGREE CONFLUENCE BEND DN250, FLANGED ALL ENDS	1 No.
16	DN250, 975mm LONG PIPE, FBE	2 No.
17	DN250/DN200 Reducer, FBE	2 No.
18	DN250, 965mm LONG PIPE WITH 90 DEGREE BEND, FBE	2 No.
19	DN250/DN150 FLANGED REDUCER	2 No.

PIPE LAYOUT AND SCHEDULE

NOTES:

CLIENT:

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ENGINEER:

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

MECHANICAL PUMPSTATION FITTINGS

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	S FUNEKA (Pr Tech Eng)	
DRAWN	T MANQELE	
CHECKED	S FUNEKA (Pr Tech Eng)	
APPROVED		
SCALE	AS SHOWN	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER		DRAWING NUMBER	
VU-WTR-24-005		M102	
STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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BENDING SCHEDULE (SANS 282:2011)

MEMBER		REINFORCEMENT					BENDING					
UNIT	No.	Diameter	Mark	Unit	Total	Length	*Shape Code*	A	B	C	D	E/r
STRIP FOOTING	1	Y12	**01**	24	24	8400	*20*	8400				
		Y12	**02**	24	24	7800	*20*	7800				
		R10	**03**	124	124	1940	*60*	200	700			

		06	08	10	12	16	20	25	32	40	Totals
Length (m)	R			240.560							240.560
	Y				388.800						388.800
Weight (ton)	R			0.148							0.148
	Y				0.345						0.345
										Total Weight (ton):	**0.49**

BENDING SCHEDULE (SANS 282:2011)

MEMBER		REINFORCEMENT					BENDING					
UNIT	No.	Diameter	Mark	Unit	Total	Length	*Shape Code*	A	B	C	D	E/r
COLUMNS	6	Y16	**04**	4	24	1260	*37*	200	1100			
		Y16	**05**	4	24	3680	*20*	3680				
		Y16	**06**	4	24	1860	*37*	300	1600			
		R10	**07**	21	126	940	*60*	200	200			

		06	08	10	12	16	20	25	32	40	Totals
Length (m)	R			118.440							118.440
	Y					163.200					163.200
Weight (ton)	R			0.073							0.073
	Y					0.258					0.258
										Total Weight (ton):	**0.33**

BENDING SCHEDULE (SANS 282:2011)

MEMBER		REINFORCEMENT					BENDING					
UNIT	No.	Diameter	Mark	Unit	Total	Length	*Shape Code*	A	B	C	D	E/r
FLOOR SLAB	1	R10	**19**	132	132	1120	*83*	300	150	300	300	

		06	08	10	12	16	20	25	32	40	Totals
Length (m)	R			147.840							147.840
	Y										0.000
Weight (ton)	R			0.091							0.091
	Y										0.000
										Total Weight (ton):	**0.09**

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PROJECT: BULK WATER SUPPLY TO SILOBELA, EXTENTION 5	DESIGNED: K JAGARNATH (Pr Tech Eng)	DATE: 03/03/2026	
	DRAWN: A.POTE	SHEET: 1 of 1	
TITLE: BENDING SCHEDULES	CHECKED: K JAGARNATH (Pr Tech Eng)	SCALE: 1:1	
	VU-WTR-24-005	1 of 2	00

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BENDING SCHEDULE (SANS 282:2011)

MEMBER		REINFORCEMENT					BENDING					
UNIT	No.	Diameter	Mark	Unit	Total	Length	*Shape Code*	A	B	C	D	E/r
BEAM TYPE 01	2	Y12	**08**	4	8	8760	*38*	460	7900	460		
		Y12	**09**	2	4	7900	*20*	7900				
		R10	**10**	41	82	1460	*60*	480	180			
BEAM TYPE 02	2	R10	**10**	38	76	1460	*60*	480	180			
		Y12	**11**	4	8	8160	*38*	460	7300	460		
		Y12	**12**	2	4	7300	*20*	7300				
BEAM TYPE 03	3	Y20	**13**	6	18	8510	*38*	670	7300	640		
		Y20	**14**	2	6	7300	*20*	7300				
		R10	**15**	38	114	1860	*60*	680	180			

		06	08	10	12	16	20	25	32	40	Totals
Length (m)	R			442.720							442.720
	Y				196.160		196.980				393.140
Weight (ton)	R			0.273							0.273
	Y				0.174		0.487				0.661
										Total Weight (ton):	**0.93**

BENDING SCHEDULE (SANS 282:2011)

MEMBER		REINFORCEMENT					BENDING					
UNIT	No.	Diameter	Mark	Unit	Total	Length	*Shape Code*	A	B	C	D	E/r
ROOF SLAB	1	Y12	**16**	116	116	9240	*38*	100	9100	100		
		Y12	**17**	124	124	8640	*38*	100	8500	100		
		R10	**18**	182	182	1020	*83*	300	100	300	300	

		06	08	10	12	16	20	25	32	40	Totals
Length (m)	R			185.640							185.640
	Y				2,143.200						2,143.200
Weight (ton)	R			0.115							0.115
	Y				1.903						1.903
										Total Weight (ton):	**2.02**

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PROJECT: BULK WATER SUPPLY TO SILOBELA, EXTENTION 5	DESIGNED: K JAGARNATH (Pr Tech Eng)	DATE: 03/03/2026	
	DRAWN: A.POTE	SHEET: 2 of 2	
TITLE: BENDING SCHEDULES	CHECKED: K JAGARNATH (Pr Tech Eng)	SCALE: 1:1	
	VU-WTR-24-005	1 of 2	00

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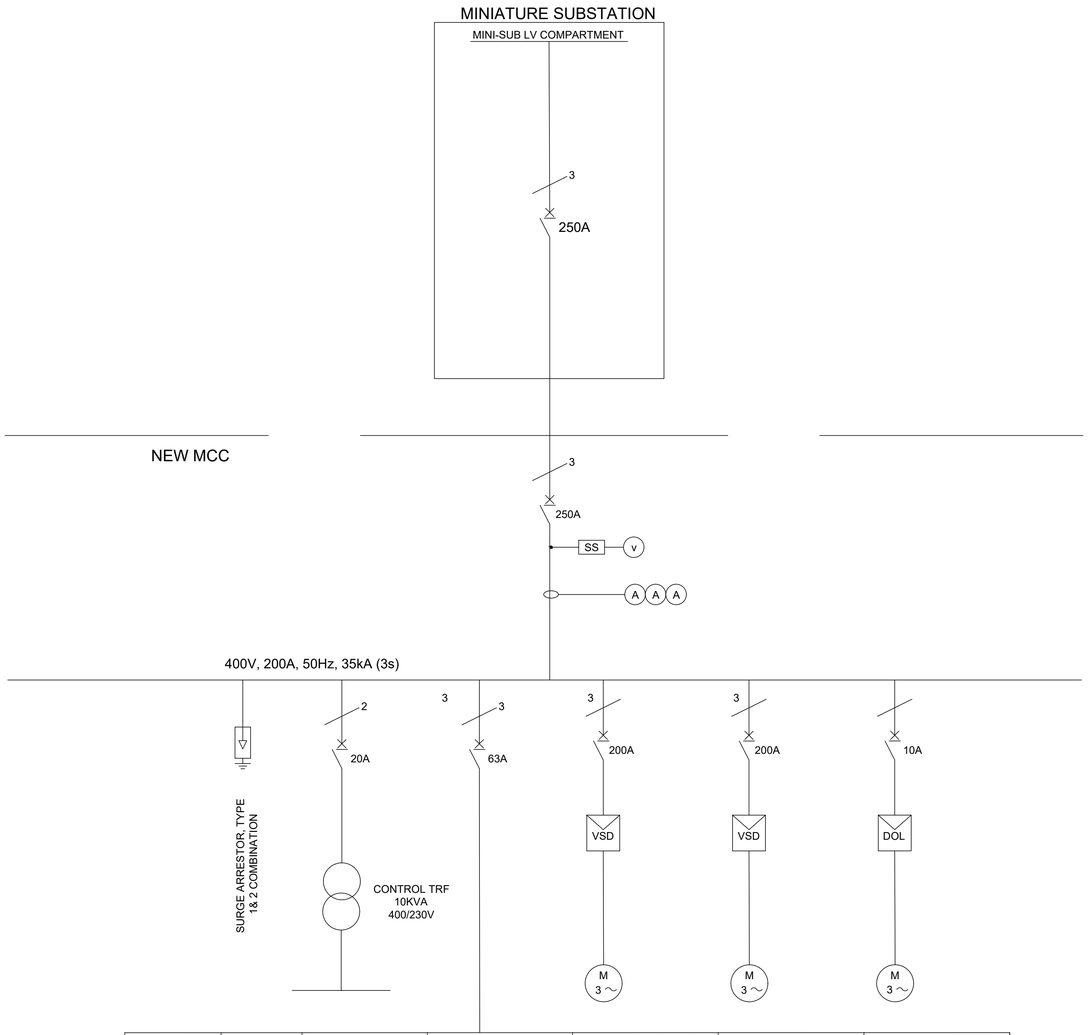
MAIN MCC

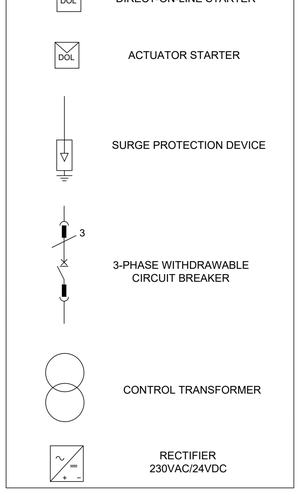
MANUFACTURER	: XXX
VOLTAGE	: 400V, 3ph + N + E
Ipsc	:35kA
FREQUENCY	: 50Hz
TAG No.	: MCC-SPS
MAIN INCOMER	: 250A ACB
FAULT RATING	: 35kA
COLOUR	: B26 ELECTRIC ORANGE
MATERIAL	: 3CR12 (2MM)
IP RATING	: IP46 (MINIMUM)
SPECIFICATION	: IEC 60439
FED FROM	: MINI-SUB
INCOMER CABLE	: 2X50mm², 4C+E

NEW MCC



TAG No.	-	-	-	-	-	-
START-UP	DIRECT FEED	DIRECT FEED	DIRECT FEED	VSD	VSD	VSD
kW RATING	-	-	-	110	110	3.7
CABLE SIZE	50mm², 4C+E	4mm², 3C+E	10mm², 4C+E	95mm², 3C+E	95mm², 3C+E	4mm², 3C+E
CABLE TYPE						
DESCRIPTION	SURGE ARRESTORS	CONTROL TRANSFORMER	LOCAL DB	POTABLE WATER PUMP 1	POTABLE WATER PUMP 2	A/C DUCTING FAN

SINGLE LINE DIAGRAM LEGEND



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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

MCC SINGLE LINE DIAGRAM

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	S FUNEKA (Pr Tech Eng)	
DRAWN	T MANQELE	
CHECKED	S FUNEKA (PR TECH ENG)	
APPROVED		
SCALE	NTS	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER		
VU-WTR-24-005	E100		
STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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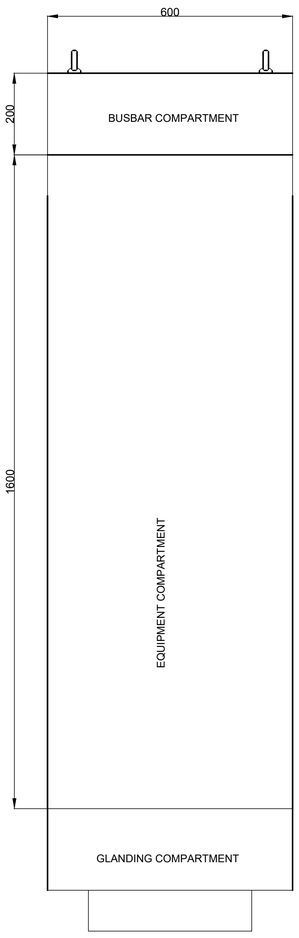

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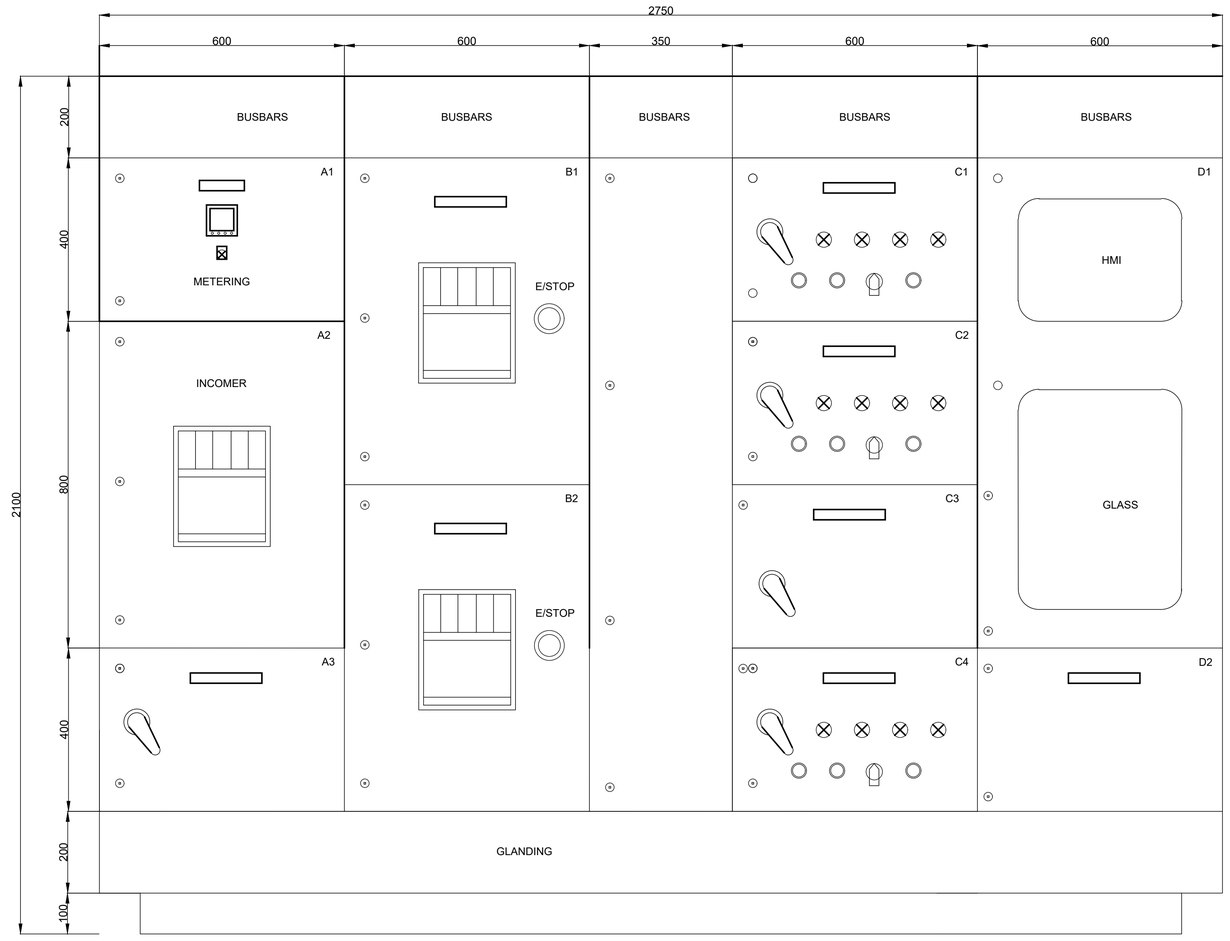

MCC-LHS VIEW

MCC - FRONT VIEW

MCC BUCKET-A

BREAKER NUMBER	TAG NUMBER	EQUIPMENT DESCRIPTION	kW
A1	-	METERING	-
A2	-	MCC INCOMER	-
A3	-	CONTROL TRANSFORMER	-

MCC BUCKET-B

BREAKER NUMBER	TAG NUMBER	EQUIPMENT DESCRIPTION	kW
B1	-	POTABLE WATER PUMP 1	110
B2	-	POTABLE WATER PUMP 2	110

MCC BUCKET-C

BREAKER NUMBER	TAG NUMBER	EQUIPMENT DESCRIPTION	kW
C1	-	A/C DUCTING FAN	3.7
C2	-	PUMP 1 CONTROLS	-
C3	-	PUMP 2 CONTROLS	-
C4			

MCC BUCKET-D

BREAKER NUMBER	TAG NUMBER	EQUIPMENT DESCRIPTION	kW
D1	-	PLC & HMI	-
D2	-	SPARE	-
D3	-		-
D4	-		-

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

MCC GENERAL ARRANGEMENT

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	S FUNEKA (Pr Tech Eng)	
DRAWN	T MANQELE	
CHECKED	S FUNEKA (PR TECH ENG)	
APPROVED		
SCALE	NTS	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	E101

STAGE	SHEET SIZE	SHEET No.	REVISION
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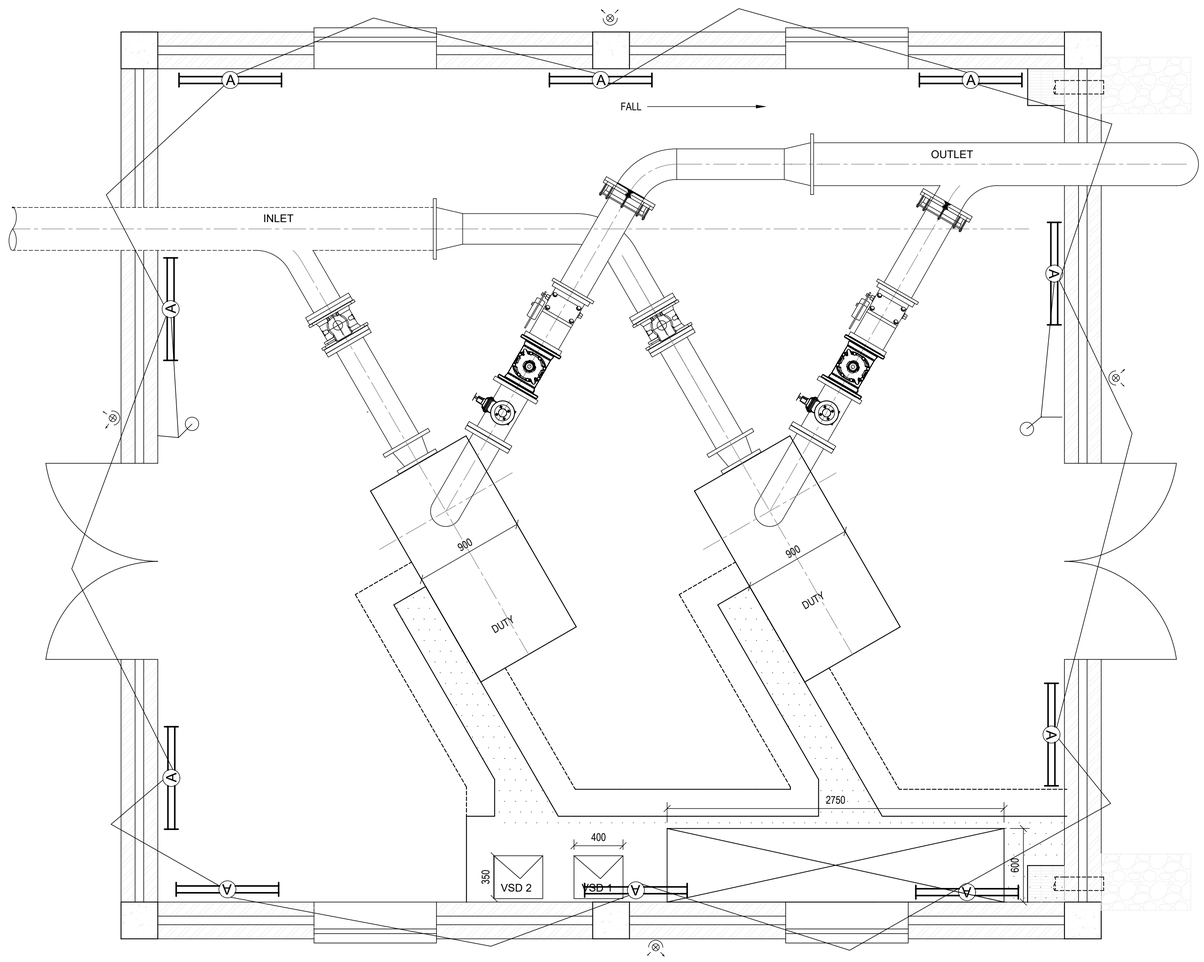

FLOOR PLAN
SCALE: 1:25

LEGEND	
42.8 W LED BULKHEAD LIGHT FITTING. IP 65 WITH SURGE PROTECTION WALL-MOUNTED AT 2.3M ABOVE GROUND / CEILING MOUNTED	
VAPOUR-PROOF 5FT LIGHT FITTING COMPLETE WITH DOUBLE 22W LED TUBES WALL-MOUNTED AT 2.3M ABOVE GROUND	
IP67 FLOOD LIGHT FITTING COMPLETE WITH 100W LED LAMP MOUNTED ON THE ROOF	
3 - PIN PLUG IN TYPE PHOTOCELL (DAYLIGHT SWITCH)	PC
1-LEVER SWITCH MOUNTED 1.1M ABOVE FFL	

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

ELECTRICAL LAYOUT

RESPONSIBLE PERSONNEL		SIGNATURE
DESIGNED	S FUNEKA (Pr Tech Eng)	
DRAWN	T MANQELE	
CHECKED	S FUNEKA (PR TECH ENG)	
APPROVED		
SCALE	NTS	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER
ALMP09/2022

PROJECT NUMBER		DRAWING NUMBER	
VU-WTR-24-005		E102	
STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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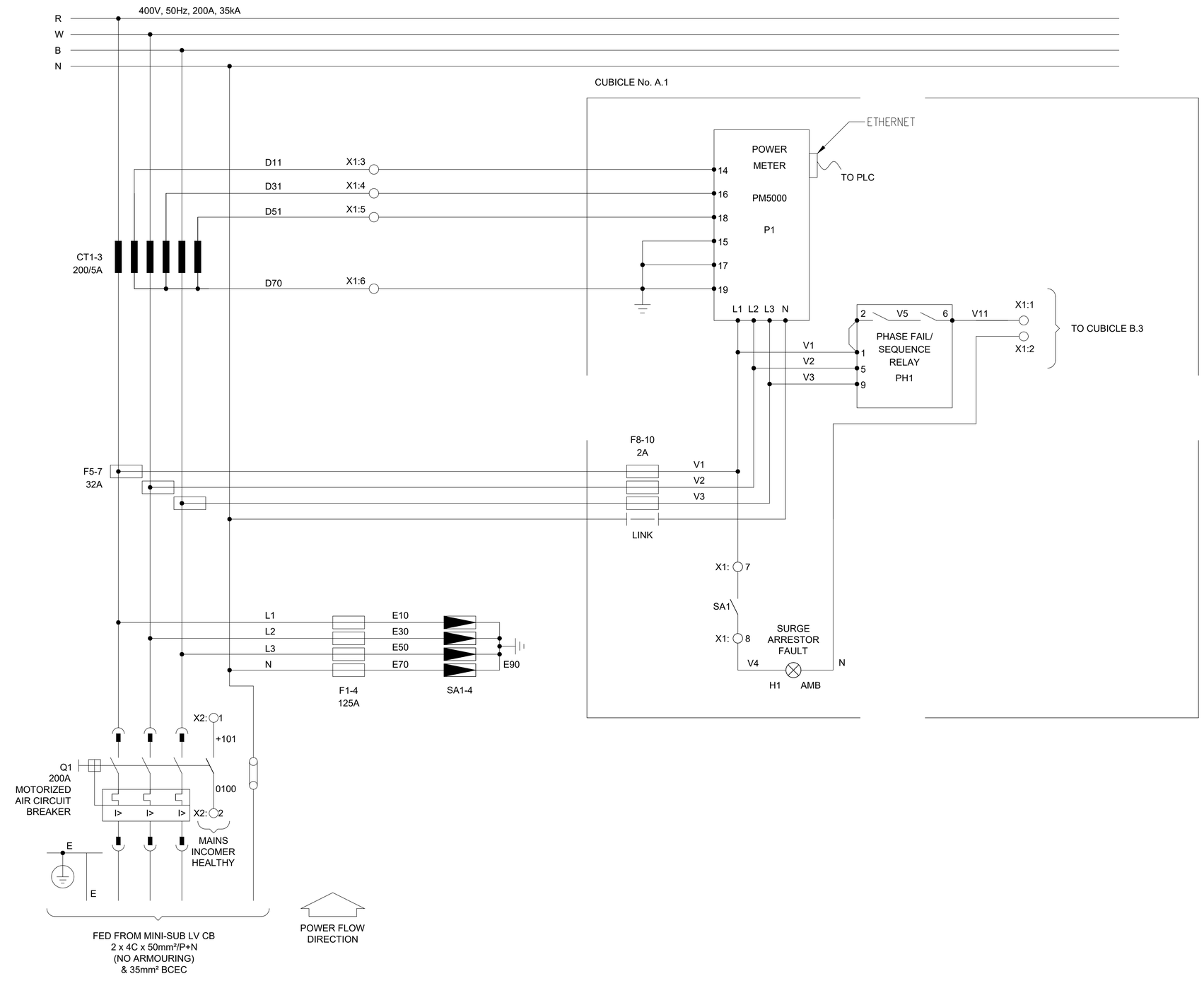
CUBICLE No. A.1 AND A.2



NOTES:

CLIENT:

ALBERT LUTHULI MUNICIPALITY

Physical Address:
28 Kerk Street,
Carolina,
1185

ENGINEER:

KUFANIKIWA CONSULTING

Physical Address:
Derby Downs Office Park
11 Derby Place
Westville
3629

Postal Address:
Suite 208,
Postnet x817

Tel : (031) 701 1038
Fax : (031) 701 0963
E-mail : info@kufanikiwa.co.za

Website Link or Address : www.kufanikiwa.co.za

DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

MCC SCHEMATICS: MAIN INCOMER

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	S FUNEKA (Pr Tech Eng)	
DRAWN	T MANQELE	
CHECKED	S FUNEKA (PR TECH ENG)	
APPROVED		
SCALE	NTS	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	E103

STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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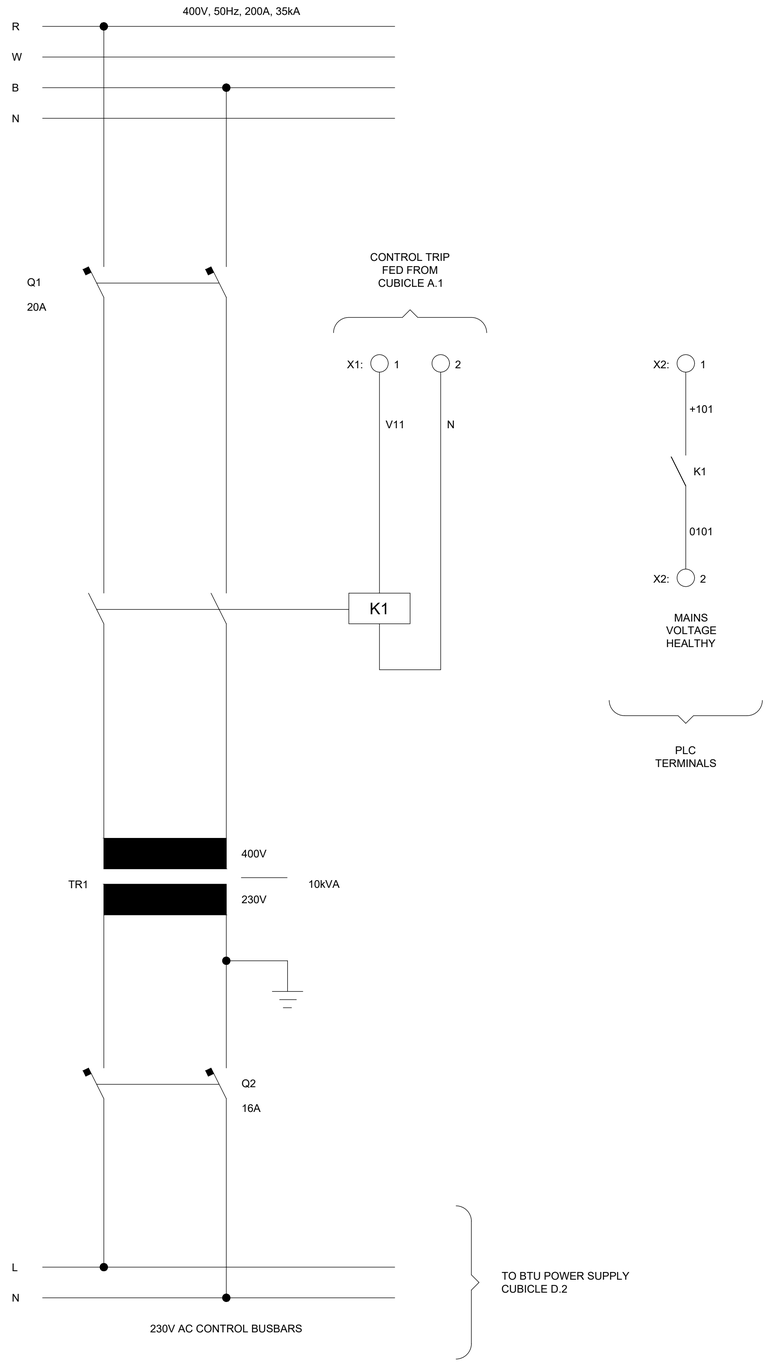

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

MCC SCHEMATICS: CONTROL TRANSFORMER

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	S FUNEKA (Pr Tech Eng)	
DRAWN	T MANQELE	
CHECKED	S FUNEKA (PR TECH ENG)	
APPROVED		
SCALE	NTS	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	E104

STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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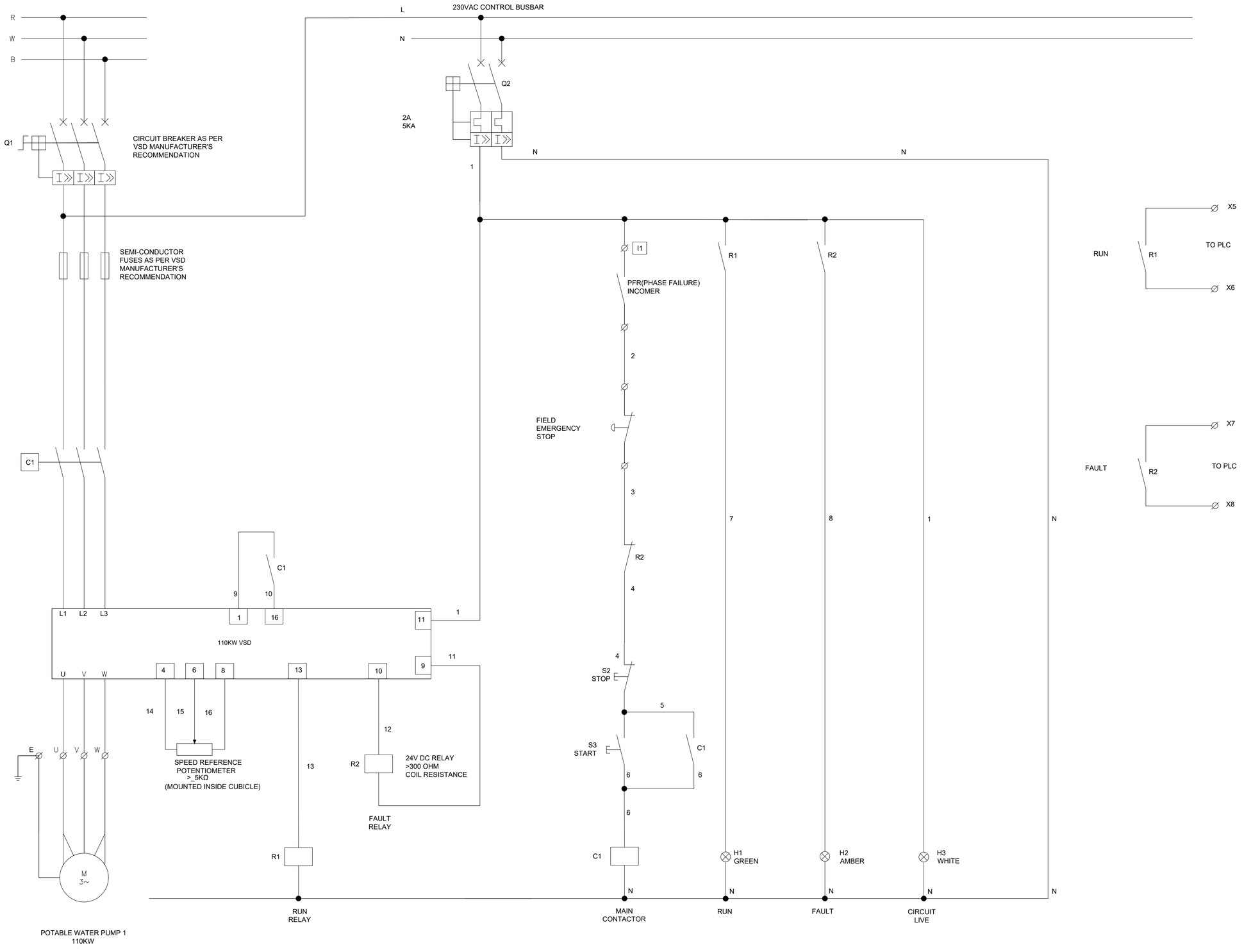

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

MCC SCHEMATICS: VSD1

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	S FUNEKA (Pr Tech Eng)	
DRAWN	T MANQELE	
CHECKED	S FUNEKA (PR TECH ENG)	
APPROVED		
SCALE	NTS	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	E105

STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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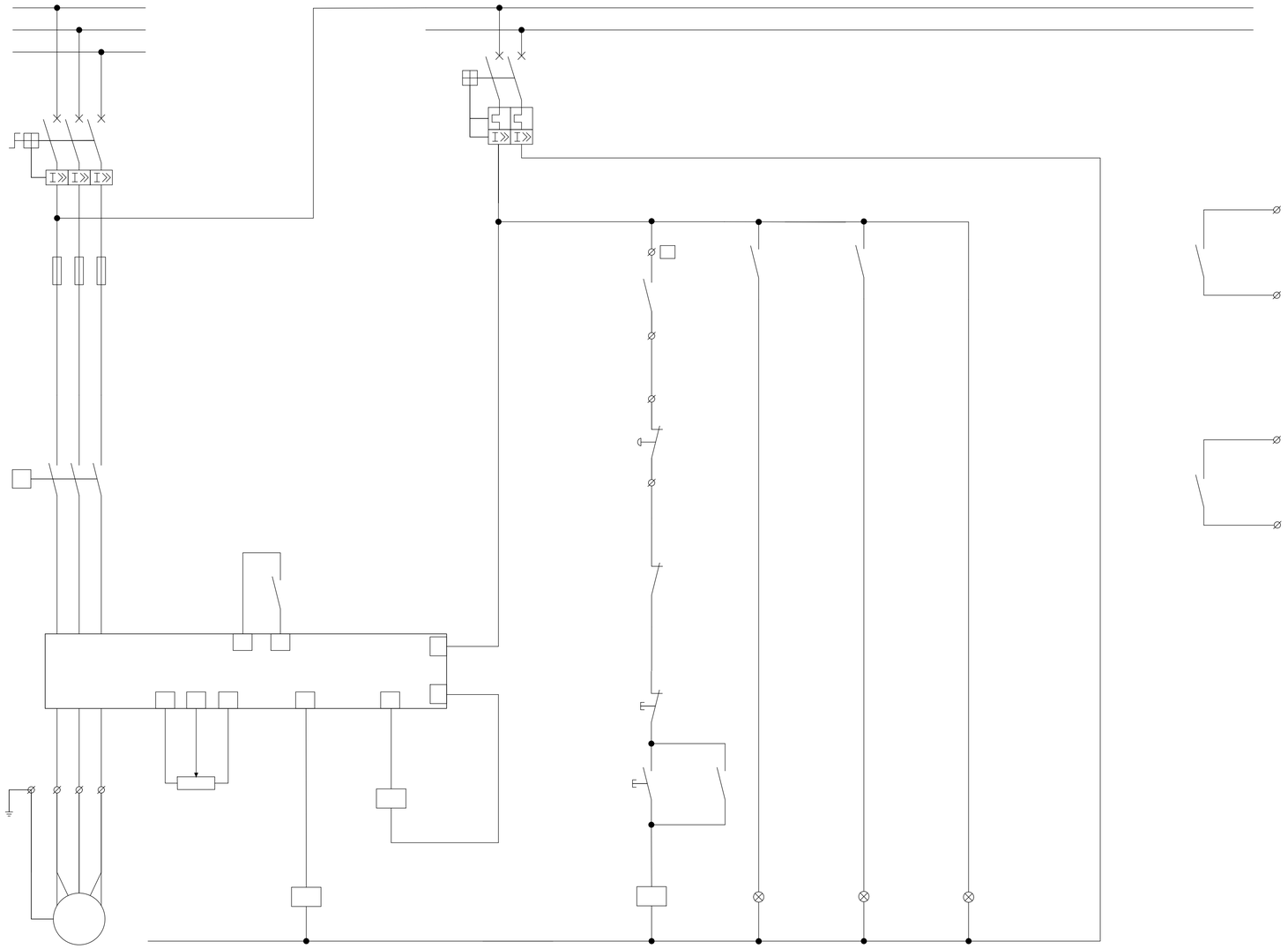

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

MCC SCHEMATICS: VSD2

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	S FUNEKA (Pr Tech Eng)	
DRAWN	T MANQELE	
CHECKED	S FUNEKA (PR TECH ENG)	
APPROVED		
SCALE	NTS	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER		DRAWING NUMBER	
VU-WTR-24-005		E106	
STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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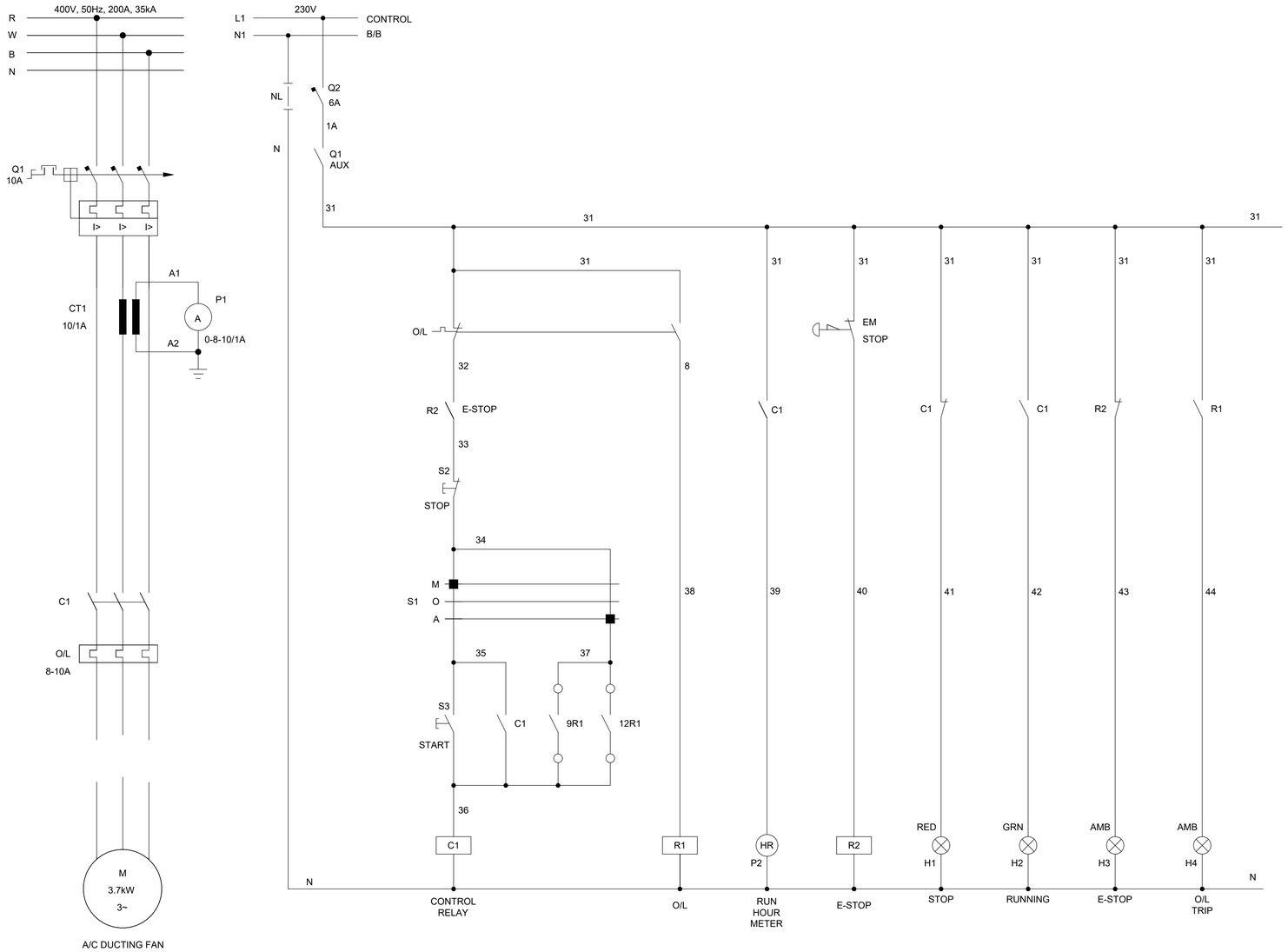

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

MCC SCHEMATICS: A/C DUCTING FAN

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	S FUNEKA (Pr Tech Eng)	
DRAWN	T MANQELE	
CHECKED	S FUNEKA (PR TECH ENG)	
APPROVED		
SCALE	NTS	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	E107

STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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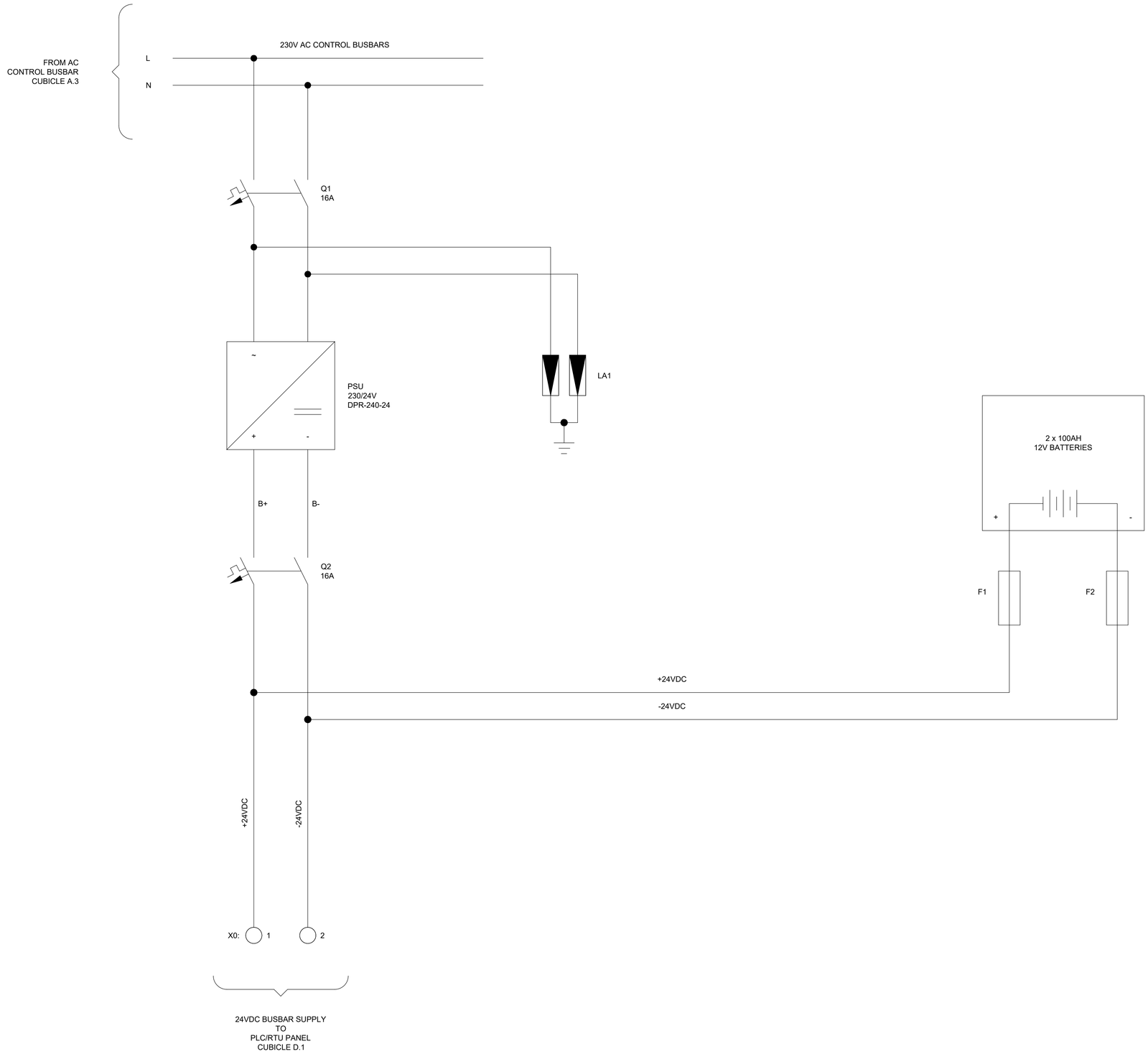

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO
SILOBELA, EXTENTION 5

DRAWING TITLE:

MCC SCHEMATICS:
PLC POWER SUPPLY

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	S FUNEKA (Pr Tech Eng)	
DRAWN	T MANQELE	
CHECKED	S FUNEKA (PR TECH ENG)	
APPROVED		
SCALE	NTS	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	E108

STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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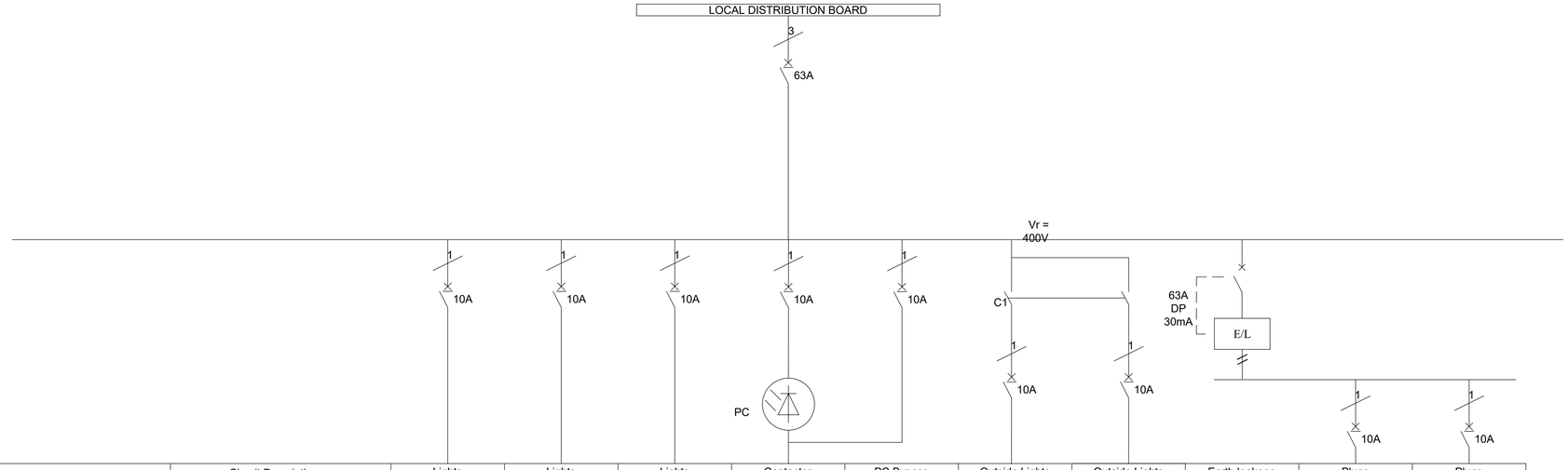

CIRCUIT IDENTIFICATION	Circuit Description	Lights	Lights	Lights	Contactor	PC Bypass	Outside Lights	Outside Lights	Earth leakage	Plugs	Plugs
	Plant Codification	L1	L2	L3	-	-	L6	L7	E/L	P1	P2
	Cubicle Number	-	-	-	-	-	-	-	-	-	-
SCPD SPECIFICATION	SCPD Type	MCB	MCB	MCB	MCB	MCB	MCB	MCB	MCB	MCB	MCB
	SCPD Rating (A)	10A	10A	10A	10A	10A	10A	10A	63A	20A	20A
CABLE DETAILS	Cable Size (mm^2)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	2.5	2.5
	No. of Cores	2 + Earth	2 + Earth	2 + Earth	2 + Earth	2 + Earth	2 + Earth	2 + Earth	-	2 + Earth	2 + Earth
	No. of Cables	1	1	1	1	1	1	1	-	1	1
	Cable Type	House wire	House wire	House wire	House wire	House wire	House wire	House wire	-	House wire	House wire
CABLE LENGTHS	(m)	-	-	-	-	-	-	-	-	-	-

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

MCC SCHEMATICS:
LOCAL DB

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	S FUNEKA (Pr Tech Eng)	
DRAWN	T MANQELE	
CHECKED	S FUNEKA (PR TECH ENG)	
APPROVED		
SCALE	NTS	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER		DRAWING NUMBER	
VU-WTR-24-005		E109	
STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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THE FOLLOWING DOCUMENTATION IS TO BE READ IN CONJUNCTION WITH THE KUFANIKIWA SPECIFICATIONS FOR:

1. PLAIN AND REINFORCED CONCRETE.
2. SMOOTH SURFACE AND EXPOSED AGGREGATE SURFACE FINISHES.
3. CONCRETE SCREED.
4. CONCRETE FOR AQUEOUS LIQUID-RETAINING STRUCTURES.

GENERAL:

G1. THESE NOTES MUST BE READ IN CONJUNCTION WITH THE SPECIFICATIONS IN THE BILL OF QUANTITIES. WHERE DISCREPANCIES ARISE, SUCH DISCREPANCIES MUST BE DRAWN TO THE ATTENTION OF THE ENGINEER, IMMEDIATELY, IN WRITING.

G2. ANY DISCREPANCIES IN DIMENSIONS AND SETTING OUT MUST BE REPORTED TO THE ENGINEER IMMEDIATELY, IN WRITING BEFORE CONSTRUCTION COMMENCES.

G3. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH THE ARCHITECT'S DRAWINGS.

G4. ALL WATER-PROOFING TO BE TO ARCHITECT'S DETAIL

G5. ALL WORK TO BE IN ACCORDANCE WITH THE NATIONAL BUILDING REGULATIONS.

G6. PLEASE NOTIFY ENGINEER FOR INSPECTION 24HOURS BEFORE POURING OF CONCRETE.

G7. MAXIMUM DESIGN FOUNDATION BEARING PRESSURE:
G7.1. 250 KPa

G8. FOUNDING:
FOUNDATIONS ARE SUBJECT TO ALTERATIONS AS EXCAVATIONS PROCEED.

G8.1. NO FOUNDATIONS ARE TO BE CAST OR REINFORCEMENT FIXED UNTIL EXCAVATIONS HAVE BEEN APPROVED BY THE ENGINEER.

G8.2. DESIGN SOIL PRESSURE IS 75 KPA.

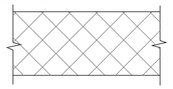
G8.3. DESIGN LOADING:
MAXIMUM ALLOWABLE LIVE LOAD ON ROOF SLAB = 2kPa

G9. THE FOLLOWING DESIGN CODES ARE APPLICABLE:
G9.1 WATER RETAINING STRUCTURES - BS 8007
G9.2 REINFORCED CONCRETE - BS 8110
G9.3 LOADINGS - SANS 10160

G10. ALL BASES AND COLUMNS ARE SYMMETRICAL ON GRID LINES UNLESS OTHERWISE INDICATED.

G11. DIMENSIONS OF BEAMS ARE SHOWN AS WIDTH X DEPTH.

G12. CONTINUOUS LOAD BEARING SLIDING SUPPORTS ARE INDICATED AS FOLLOWS:



KILCHER BEARINGS (TEFLON OR LIMITGLISS) OR APPROVED EQUIVALENT IS TO BE USED (WIDTH AND LOAD BEARING CAPACITY IS INDICATED ON DRAWINGS).

G13. NO BASES ON BACKFILL - USE MASS CONCRETE BELOW BASES UNLESS OTHERWISE SPECIFIED.

G14. ALL BEAMS AND STRUCTURAL SLABS MUST BE PROVIDED WITH AN UPWARD CAMBER AS SHOWN BELOW UNLESS INDICATED OTHERWISE:
CANTILEVERS: SPAN DIVIDED BY 200
ALL OTHER SPANS:SPAN DIVIDED BY 500

G15. JOINTS, INDICATED IN SURFACE BEDS, SLABS AND BEAMS, ARE ALSO TO BE CONSTRUCTED IN BRICK WALLS, SCREEDS AND FINISHES.

G16. THE CONTRACTOR MUST ENSURE THAT ALL EMBEDDED ITEMS FOR SERVICES HAVE BEEN PROVIDED FOR, AND POSITIONED, ACCORDING TO THE LATEST DRAWINGS OF ALL DISCIPLINES BEFORE CASTING CONCRETE.

G17. ALL FINISHES TO COMPLY WITH CONCRETE SPECIFICATION FOR CONCRETE FINISHING DETAILS REFER TO FINISHING SCHEDULE

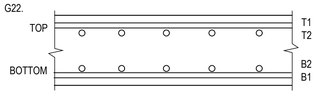
G18. PROVISIONS FOR PROPS UNDER SLABS AND BEAMS: THE CONTRACTOR MUST ENSURE THAT BEAMS AND/OR SLABS HAVE SUFFICIENT STRENGTH AND/OR ARE ADEQUATELY PROPPED TO CARRY CONSTRUCTION LOADS FROM ABOVE. DISCUSS WITH ENGINEER.

G19. ENGINEER TO CONFIRM EXCAVATION LEVELS ON SITE. EXTRA EXCAVATION DOWN TO ACCEPTABLE MATERIAL SHALL BE BACKFILLED WITH MASS CONCRETE, UNLESS OTHERWISE SPECIFIED.

G20. UNLESS OTHERWISE SHOWN ALL SMOOTH SURFACE CONCRETE CORNERS ARE TO BE PROVIDED WITH 25mm x 25mm CHAMFERS.

G21. STORAGE OF CEMENT: CEMENT SHALL NOT BE STORED FOR LONGER PERIODS THAN 6 WEEKS, WITHOUT THE APPROVAL OF THE ENGINEER.

G22.



G23. DRAWINGS SHALL BE READ IN CONJUNCTION WITH PIPEWORK DRAWINGS AND ANY DISCREPANCIES MUST BE REPORTED IMMEDIATELY.

G24. ACCORDING TO THE COPYRIGHT ACT, 1978 (ACT No. 98 OF 1978) NO PART OF THIS DOCUMENT MAY BE REPRODUCED, STORED IN A RETRIEVAL SYSTEM OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WHATSOEVER INCLUDING MECHANICAL,ELECTRONIC, PHOTOCOPYING, MICROFILMING OR ANY OTHER SYSTEM OF INFORMATION STORAGE WITHOUT WRITTEN PERMISSION.

CONCRETE:

C1. EXCEPT WHERE MENTIONED OTHERWISE ON DRAWING NOTES THE CONCRETE WORK MUST CONFORM WITH THE CONDITIONS SET OUT IN SANS 10100 PART 2 AND SANS 1200 SECTION G

C2. MATERIALS AND MIX PROPORTIONS:
C1.1 THE GRADES FOR CONCRETE, UNLESS OTHERWISE INDICATED SHALL BE AS FOLLOWS:

COLUMNS	CLASS 30/19mm
RESERVOIR WALLS	CLASS 35/19mm
SUSPENDED SLABS	CLASS 30/19mm
SURFACE BED	CLASS 30/19mm
MASS CONCRETE	CLASS 30/19mm
BLINDING LAYERS	CLASS 15/19mm

C3. A SET OF THREE TEST CUBES MUST BE MADE OF EVERY 50M³ (OR PORTION THEREOF) OF EVERY GRADE OF CONCRETE POURED ON ANY SPECIFIC DAY CURED IN ACCORDANCE WITH THE METHODS SET OUT IN THE NBR AND TESTED BY LABORATORIES APPROVED BY THE ENGINEER

C4. CONCRETE COVER TO THE REINFORCEMENT MUST BE AT LEAST THE DIMENSIONS OF THE DIAMETER OF THE MAIN REINFORCING OR ELSE AS SET OUT BELOW UNLESS SHOWN OTHER WISE:

STRUCTURAL ELEMENT	MIN. COVER (mm)
RAFT FOUNDATIONS	50
STRIP FOOTINGS	30
COLUMNS	30
BEAMS	25
SLABS	25
WALLS	30
RET. WALLS, RET. FACES	40
TOP STEEL IN SLABS	25

C4.1. SPACER BLOCKS, APPROVED BY THE ENGINEER, ARE TO BE USED TO MAINTAIN THE NECESSARY CONCRETE COVER TO THE REINFORCEMENT

C4.2. NO CONCRETE IS TO BE POURED BEFORE THE ENGINEER HAS INSPECTED AND APPROVED THE FIXING OF THE REINFORCEMENT

C4.3. BREAKS IN CONCRETE AND CONSTRUCTION JOINTS ARE TO BE MADE ONLY WITH THE APPROVAL OF THE ENGINEER.

C4.4. SHOULD THERE BE A BREAK OF MORE THAN 45 MINUTES AT ANY TIME IN THE POURING OF CONCRETE, THIS FACT MUST BE DRAWN TO THE ATTENTION OF THE ENGINEER

C5. CASTING OF CONCRETE IN EXCESS OF 3.5m HIGH IS NOT PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER.

C5.1. SHUTTERING AND PROPPING MAY BE STRUCK ONLY AFTER THE LAPSE OF THE FOLLOWING TIMES, UNLESS OTHERWISE AUTHORISED:

POSITION OF SHUTTERING/PROPS	STRIKING TIMES(DAYS)
BEAM SIDES, WALLS AND UNLOADED COLS.	2
SLAB SOFFITS WITHOUT REMOVAL OF SLAB PROPS	4
BEAM SOFFITS WITHOUT REMOVAL OF BEAM PROPS	7
PROPS - UNLOADED SLABS	10
PROPS - UNLOADED BEAMS	14

C6. LEGEND

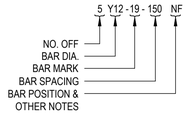
D/S	- DOWN STAND
RWP	- RAINWATER PIPE
UON	- UNLESS OTHERWISE NOTED
	- ARE COLUMN UNDER ONLY
	- ARE COLUMN OVER ONLY
	- ARE COLUMN UNDER AND OVER
LEVEL / DESCRIPTION	- LEVEL IN ELEVATION
LEVEL / DESCRIPTION	- LEVEL IN PLAN
STEP HEIGHT	- STEP

C7. REINFORCEMENT SHALL BE INSPECTED BY THE ENGINEER ONLY AFTER IT HAS BEEN COMPLETELY FIXED IN POSITION, FORMWORK IS CLEAN, SPACERS ARE PLACED IN POSITION, AND AFTER THE CONTRACTOR HAS INSPECTED IT HIMSELF.

LEGEND

T	-Top	SF	- Side Face
T1	- Highest of Top Layers	EW	- Each Way
T2	- 2nd Highest of Top Layers etc.	ALT	- Alternate
B	- Bottom	ABR	- Alternate Bar Reversed
B1	- Lowest of Bottom Layers	STG	- Staggered
B2	- 2nd Lowest of Bottom Layers etc.	TOG	- Together
NF	- Near Face	VERT	- Vertical
FF	- Far Face	HORIZ	- Horizontal
EF	- Each Face	PRS	- in Pairs

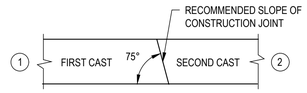
REINFORCEMENT CALL NOTE:



CONCRETE (cont.):

C8. WELDING OF REINFORCEMENT IS NOT ALLOWED UNLESS IT HAS BEEN APPROVED BY THE ENGINEER IN WRITING.

C9. CONSTRUCTION JOINTS IN SLABS/ BEAMS:
BEFORE COMMENCING TO CONSTRUCT NEW CONCRETE (AS INDICATED BY 2) THE SURFACE OF THE OLD CONCRETE (INDICATED BY 1) SHALL BE CLEANED AND CHIPPED TO EXPOSE THE AGGREGATE AND SHALL BE KEPT WET FOR 2 HOURS BEFORE CASTING. THE OLD CONCRETE MUST BE SLUSHED WITH CEMENT BEFORE CASTING. DISCUSS DETAIL AND POSITION OF CONSTRUCTION JOINTS WITH ENGINEER.



C10. NO FINES CONCRETE - USE CLASS NF-19(NO FINES CONCRETE WITH 19mm NOMINAL SIZE AGGREGATE) THE VOLUME OF AGGREGATE FOR EACH 50kg OF CEMENT IS 0.3 METERS CUBED AND THE MIX SHALL NOT CONTAIN MORE THAN 20 LITRES OF WATER PER 50kg OF CEMENT.

C11. 75mm BLINDING LAYER (CLASS 15/19 CONCRETE IS TO BE PROVIDED UNDER ALL BASES UNLESS INDICATED OTHERWISE.

C12. SHRINKAGE STRIPS IN CONCRETE FLOORS SHALL NOT BE CAST WITHIN 21 DAYS OF CASTING THE LAST SURROUNDING SLAB. NOTE THAT THE BAY CONTAINING THE SHRINKAGE STRIP MUST REMAIN PROPPED UNTIL ALL CONCRETE HAS REACHED THE REQUIRED AGE.

C13. CONSTRUCTION JOINTS:
C12.1. NO HORIZONTAL JOINTS SHALL BE ALLOWED IN FOUNDATIONS OR OTHER DEEP ELEMENTS.
C12.2. CONSTRUCTION JOINTS ARE TO BE FORMED ACCORDING TO SPECIFICATION.
C12.3. ALL PIPES THROUGH JOINTS, SHALL BE PROVIDED WITH AN EXPANSION JOINT OR FLEXIBLE COUPLING - THIS INCLUDES ALL CABLE SLEEVES, CONDUITS AND PIPES.
C12.4. NO VERTICAL CONSTRUCTION JOINTS SHALL BE MADE IN ELEMENTS DIRECTLY EXPOSED TO THE WEATHER EXCEPT WHERE INDICATED OTHERWISE.

C14. ALL VISIBLE SHARP EDGES TO HAVE A 25mm x 25 mm CHAMFER

SURFACE BED:

SB1. 28 DAY CONCRETE STRENGTHS:
ALL SURFACE BEDS 30/19mm STONE

SB2. SAWN JOINTS TO BE PROVIDED WITHIN 24 HOURS AFTER CASTING OF CONCRETE.

SB3. SAWN JOINTS ARE TO BE CUT AT RIGHT ANGLES TO CONSTRUCTION JOINTS IN ALL CASES.

SB4. NO SAWN JOINTS SHALL BE CUT IN TWO PERPENDICULAR DIRECTIONS. (UON)

SB5. BACKFILL AROUND COLUMNS AND WALLS TO COMMENCE EVENLY.

SB6. ALL PIPED SERVICES AND CABLES MUST BE LAID DURING OR SOON AFTER THE CONSTRUCTION OF COLUMNS AND SHAFT BASES.

SB7. UNLESS OTHERWISE SPECIFIED, ALL FILL UNDER SURFACE BEDS SHALL BE 15MPa/19mm MASS CONCRETE.

SB8. MINIMUM LAP LENGTH OF MESH REINFORCEMENT IS 300mm

SB9. SURFACE BED TO BE WOOD FLOATED.

SB10. ALL DOWEL BARS ARE TO BE 100% STRAIGHT, LEVEL AND AT RIGHT ANGLES TO THE JOINT DIRECTION.

STRUCTURAL TIMBER:

T1. PREFABRICATED TIMBER ROOF TRUSSES AND PURLINS ARE TO BE DESIGNED ACCORDING TO THE SPECIFICATION, AND SUPPLIED BY A MINTEK OR SIMILAR APPROVED SUPPLIER.

T2. TIMBER ROOF TRUSSES ARE TO BE DESIGNED IN ACCORDANCE WITH SABS 0163 PART 1 - 1980 (CODE OF PRACTICE FOR TIMBER STRUCTURES). LOADS ARE TO COMPLY WITH SABS 0160 - 1989 (CODE OF PRACTICE FOR GENERAL PROCEDURES AND LOADING FOR THE DESIGN OF BUILDINGS).

T3. WORKSHOP DETAIL DRAWINGS SHALL BE CHECKED BY KUFANIKIWA BEFORE COMMENCING WITH MANUFACTURING OF TIMBER ROOF TRUSSES.

T5. LOADS ON TIMBER ROOF STRUCTURE:

ROOF CLADDING:	50 kg/m
CEILINGS:	20 kg/m
DUCTS AND CABLES:	20 kg/m
WIND LOADING:	50 YEAR RETURN PERIOD
TERRAIN CATEGORY:	CATEGORY 2
BUILDING CLASS:	CLASS B

T6. ALL TRUSSES TO BE FABRICATED IN A FACTORY BY A TIMBER TRUSS FABRICATOR WHO HAS BEEN AWARDED A "CERTIFICATE OF COMPETENCE" BY THE INSTITUTE FOR TIMBER CONSTRUCTION.

MASONRY:

B1. ALL BRICKWORK TO BE OF SOLID HARD BURNED CLAY BRICKS (UON) WITH A COMPRESSIVE STRENGTH OF NOT LESS THAN 14MPa LAID ON A CLASS 2 MORTAR WITH A 28 DAYS COMPRESSIVE STRENGTH OF 7MPa AS SPECIFIED IN SABS 0164 PART 1 - 1987 (CODE OF PRACTICE FOR MASONRY). REFER TO DRAWINGS FOR DETAILS OF LOAD BEARING WALLS.

B2. ALL BRICKWORK TO BE ACCORDANCE WITH NHBRC REGULATIONS

B3. BRICKFORCE:
ALL BRICKFORCE TO BE GALVANISED.

MINIMUM DIAMETER OF BRICKFORCE =	2.8mm
YIELD STRENGTH =	485MPa
LAP LENGTH =	400mm MIN

B4. BRICK FORCE EVERY SECOND COURSE TO UNDERSIDE SURFACE BED, THEREAFTER EVERY 3RD COURSE EXCEPT EVERY COURSE FOR 3 COURSES BELOW INTERMEDIATE SLAB AND WALL PLATE LEVEL AND ABOVE WINDOW AND DOOR LEVEL.

B5. ALL DIMENSIONS AND DETAILS OF BRICKWORK ARE AS PER THE ARCHITECTS LAYOUTS.

B6. PLACE 10mm SOFTBOARD OR OTHERWISE APPROVE MATERIAL ON TOP OF ALL NON-LOAD BEARING WALLS.

B7. TWO SHEETS 250µm DPC SHEETING TO BE PLACED ON TOP OF ALL LOAD BEARING BRICKWORK.

B8. TROWEL SMOOTH AND LEVEL AND LAY 2 LAYERS OF MALTHOID STRIP TO ALL LOAD BEARING BRICK SURFACES PRIOR TO CASTING CONCRETE

B9. "V" JOINTS ARE TO BE FORMED IN PLASTER TO EXPRESS THE INTERFACE BETWEEN CONCRETE AND BRICKWORK ON FLUSH EXPOSED PLASTERED SURFACES

B10. BRICKWORK IS NOT TO BE CONSTRUCTED OFF NEWLY CAST SUSPENDED SLABS (UNLESS DIRECTLY ABOVE LOAD BEARING WALLS) UNTIL THE SLABS HAVE BEEN PROPERLY CURED AND DE-PROPPED.

B11. ALL OPENINGS TO HAVE BRICK BEAMS OVER IN ACCORDANCE WITH NHBRC REGULATIONS AND TO MATCH SURROUNDING BRICKWORK UNLESS NOTED OTHERWISE

STRUCTURAL TIMBER:

T1. PREFABRICATED TIMBER ROOF TRUSSES AND PURLINS ARE TO BE DESIGNED ACCORDING TO THE SPECIFICATION, AND SUPPLIED BY A MINTEK OR SIMILAR APPROVED SUPPLIER.

T2. TIMBER ROOF TRUSSES ARE TO BE DESIGNED IN ACCORDANCE WITH SABS 0163 PART 1 - 1980 (CODE OF PRACTICE FOR TIMBER STRUCTURES). LOADS ARE TO COMPLY WITH SABS 0160 - 1989 (CODE OF PRACTICE FOR GENERAL PROCEDURES AND LOADING FOR THE DESIGN OF BUILDINGS).

T3. WORKSHOP DETAIL DRAWINGS SHALL BE CHECKED BY KUFANIKIWA BEFORE COMMENCING WITH MANUFACTURING OF TIMBER ROOF TRUSSES.

T5. LOADS ON TIMBER ROOF STRUCTURE:

ROOF CLADDING:	50 kg/m
CEILINGS:	20 kg/m
DUCTS AND CABLES:	20 kg/m
WIND LOADING:	50 YEAR RETURN PERIOD
TERRAIN CATEGORY:	CATEGORY 2
BUILDING CLASS:	CLASS B

T6. ALL TRUSSES TO BE FABRICATED IN A FACTORY BY A TIMBER TRUSS FABRICATOR WHO HAS BEEN AWARDED A "CERTIFICATE OF COMPETENCE" BY THE INSTITUTE FOR TIMBER CONSTRUCTION.

NOTES:

1. ALL DIMENSIONS, SETTING OUT & LEVELS TO BE CONFIRMED ON SITE BY THE CONTRACTOR PROIR TO CONSTRUCTION OR FABRICATION.
2. ANY DISCREPANCIES WITH DIMENSIONS, SETTING OUT & LEVELS TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDITELY.

CLIENT:

ALBERT LUTHULI MUNICIPALITY

Physical Address:
28 Kerk Street,
Carolina,
1185

ENGINEER:

KUFANIKIWA CONSULTING

Physical Address:
Derby Downs Office Park
11 Derby Place
Westville
3629

Postal Address:
Suite 208,
Postnet x817

Tel : (031) 701 1038
Fax : (031) 701 0963
E-mail : info@kufanikiwa.co.za

Website Link or Address : www.kufanikiwa.co.za

DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

GENERAL NOTES

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	K JAGARNATH (Pr Tech Eng)	
DRAWN	A POTE	
CHECKED	K JAGARNATH (Pr Tech Eng)	
APPROVED	K JAGARNATH (Pr Tech Eng)	
SCALE	AS SHOWN	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	G101

STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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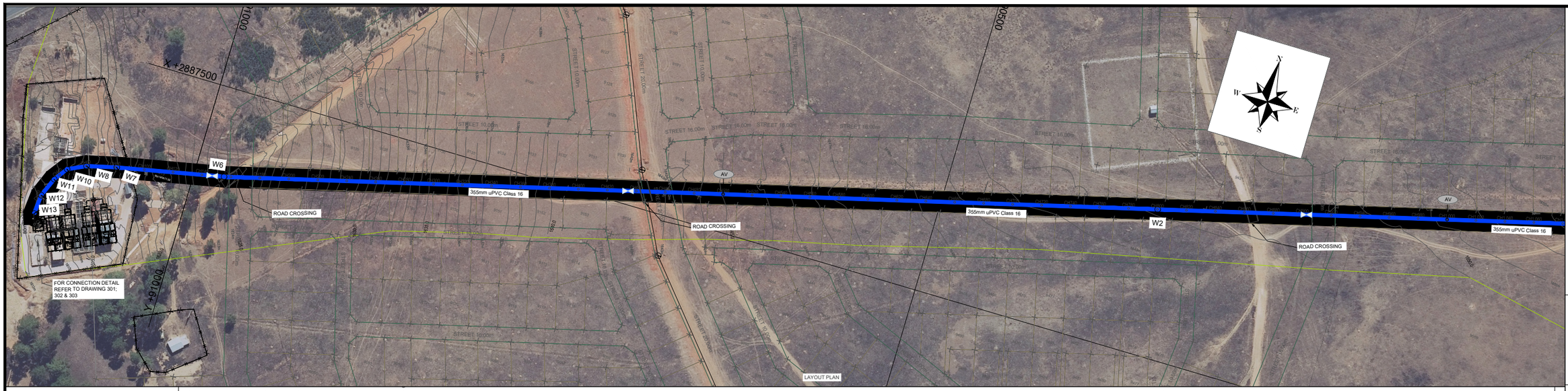
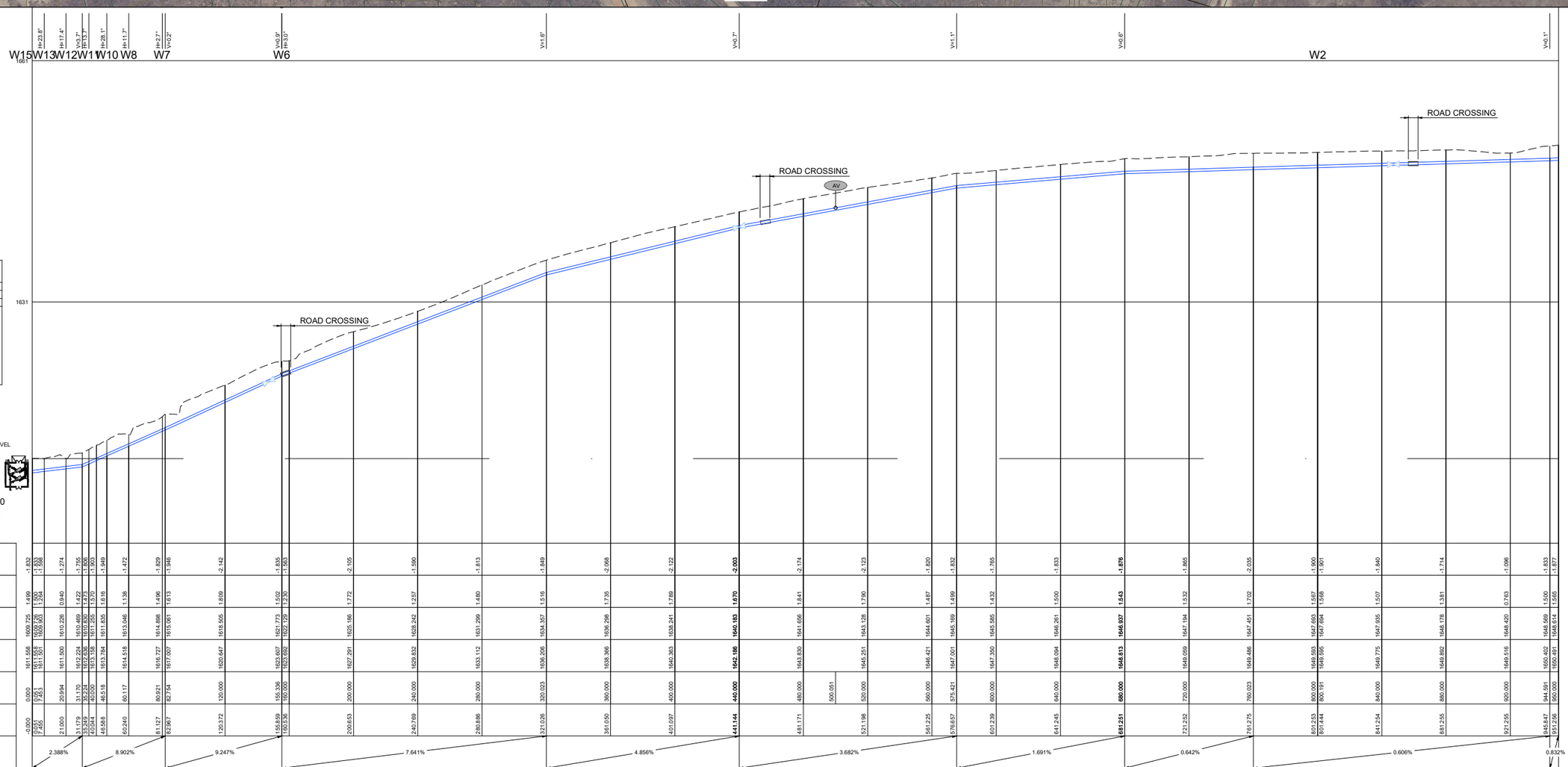


LEGEND:

- SCOUR VALVE
- AIR VALVE
- PROPOSED RESERVOIR
- PROPOSED PIPELINE 355 uPVC CLASS 16
- PUMPSTATION
- ROAD CROSSING
- ISOLATION VALVE

NOTES:

1. DEPTH TO INVERT = 1000mm + PIPE NOMINAL DIAMETER IN mm
2. DEPTH TO INVERT AT ROAD CROSSING = 1200mm + PIPE NOMINAL DIAMETER.
3. ALL PIPELINE ROAD CROSSINGS ARE AT 90 DEGREES TO THE ROAD CENTERLINE CONCERNED.



Coordinate List
Lo

Node	YLo	XLo
Extension 5		
Const:		
W2	90 355.105	2 887 399.256
W6	90 979.549	2 887 560.306
W7	91 052.457	2 887 575.085
W8	91 072.633	2 887 580.164
W10	91 084.872	2 887 586.091
W11	91 091.520	2 887 595.221
W12	91 096.939	2 887 608.378
W13	91 098.124	2 887 621.868
W15	91 095.721	2 887 628.923

STATIC GL

SURFACE LEVEL

PIPELINE

SCALES:
Horizontal 1:1000
Vertical 1:200

Datum : 1601 m

| | | |

LEGEND:

- SCOUR VALVE
- AIR VALVE
- PROPOSED RESERVOIR
- PROPOSED PIPELINE 355 uPVC CLASS 16
- PUMPSTATION
- ROAD CROSSING

NOTES:

1. DEPTH TO INVERT = 1000mm + PIPE NOMINAL DIAMETER IN mm
2. DEPTH TO INVERT AT ROAD CROSSING = 1200mm + PIPE NOMINAL DIAMETER.
3. ALL PIPELINE ROAD CROSSINGS ARE AT 90 DEGREES TO THE ROAD CENTERLINE CONCERNED.

FUNDER:

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

Physical Address:
185 Francis Baard Street
PRETORIA

Postal Address:
Private Bag X313
PRETORIA
0001
South Africa

CLIENT:

CHIEF ALBERT LUTHULI LOCAL MUNICIPALITY

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1185

Contact Details:
Telephone Number : (017) 843 4100
Website : www.albertluthuli.gov.za

ENGINEER:

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Website Link or Address : www.kufanikiwa.co.za

DRAWING REVISION

REV	BY	DESCRIPTION	DATE

CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5

SILOBELA, EXTENSION 5 LONGSECTION (CH 950 TO CH 1900)

RESPONSIBLE PERSONNEL		SIGNATURE
DESIGNED	M MLOTSHWA	
DRAWN	A SHANGASE	
CHECKED	L MTHEMBU	
APPROVED	S MNGADI (Pr Tech Eng)	
SCALE		

SIGNATURE DATE

CONTRACT NUMBER
ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	LS102

STAGE	SHEET SIZE	SHEET NO	REVISION
TENDER	A0	2 OF 4	00

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Coordinate List
Lo
Extension 5

Node	YLo	XLo
Const:		
W1	89 730.661	2 887 238.205
W3	89 316.703	2 887 422.393
W4	89 270.946	2 887 427.714
W5	89 216.272	2 887 455.571

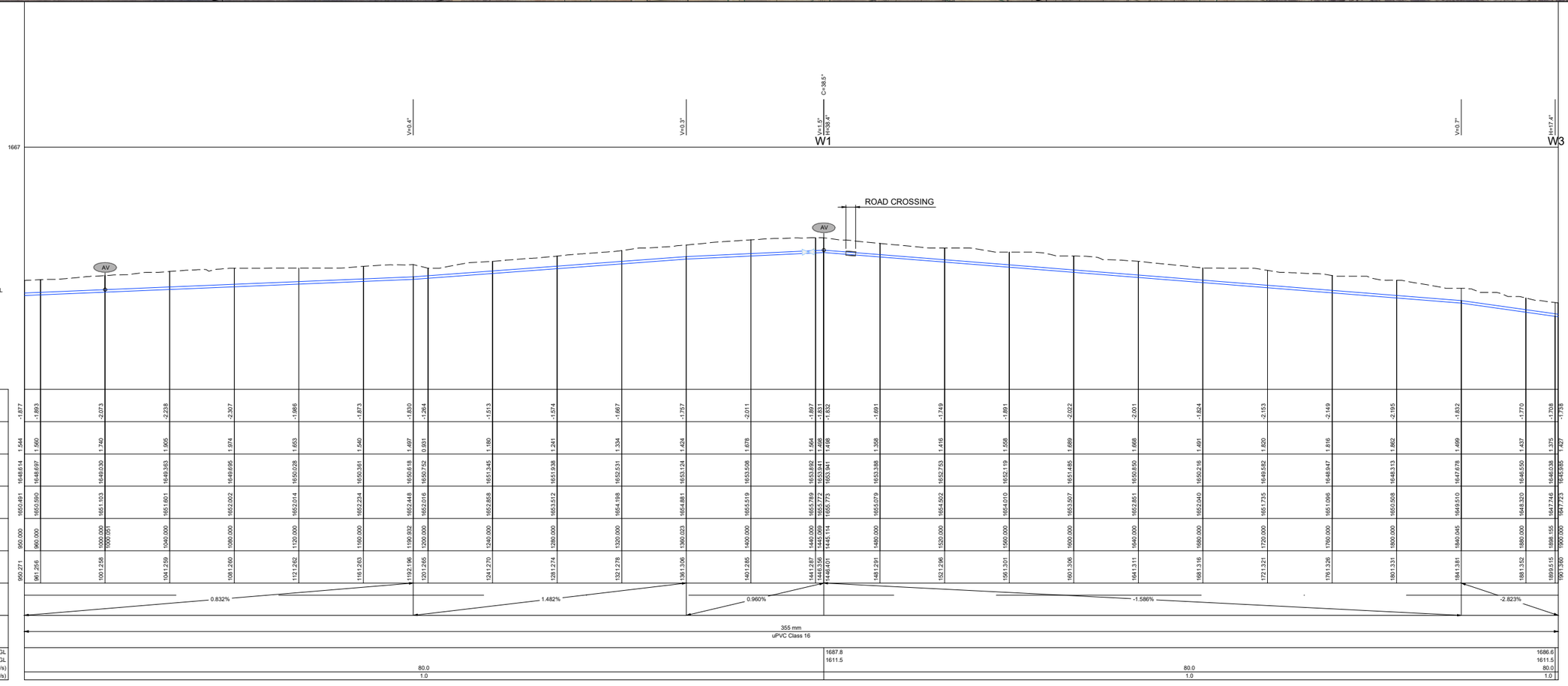
STATIC GL

SURFACE LEVEL

PIPELINE

SCALES:
Horizontal 1:1000
Vertical 1:200

Datum : 1637 m



| | | |

LEGEND:

- SCOUR VALVE
- AIR VALVE
- PROPOSED RESERVOIR
- PROPOSED PIPELINE 355 uPVC CLASS 16
- PUMPSTATION
- ROAD CROSSING

NOTES:

1. DEPTH TO INVERT = 1000mm + PIPE NOMINAL DIAMETER IN mm
2. DEPTH TO INVERT AT ROAD CROSSING = 1200mm + PIPE NOMINAL DIAMETER.
3. ALL PIPELINE ROAD CROSSINGS ARE AT 90 DEGREES TO THE ROAD CENTERLINE CONCERNED.

FUNDER:

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

Physical Address:
185 Francis Baard Street
PRETORIA

Postal Address:
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PRETORIA
0001
South Africa

CLIENT:

CHIEF ALBERT LUTHULI LOCAL MUNICIPALITY

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Website www.albertluthuli.gov.za

ENGINEER:

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Fax : (031) 701 0963
E-mail : info@kufanikiwa.co.za

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5

SILOBELA, EXTENSION 5 LONGSECTION (CH 1900 TO CH 2850)

RESPONSIBLE PERSONNEL		SIGNATURE
DESIGNED	M MLOTSHWA	
DRAWN	A SHANGASE	
CHECKED	L MTHEMBU	
APPROVED	S MNGADI (Pr Tech Eng)	
SCALE		

SIGNATURE DATE

CONTRACT NUMBER
ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	LS103

STAGE	SHEET SIZE	SHEET NO	REVISION
TENDER	A0	3 OF 4	00

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Coordinate List
Lo

Extension 5		
Node	YLo	XLo
Const:		
W4	89 270.946	2 887 427.714
W5	89 216.272	2 887 455.571
W9	88 931.313	2 887 583.975
W14	88 888.275	2 887 627.335
W16	88 702.815	2 887 705.391

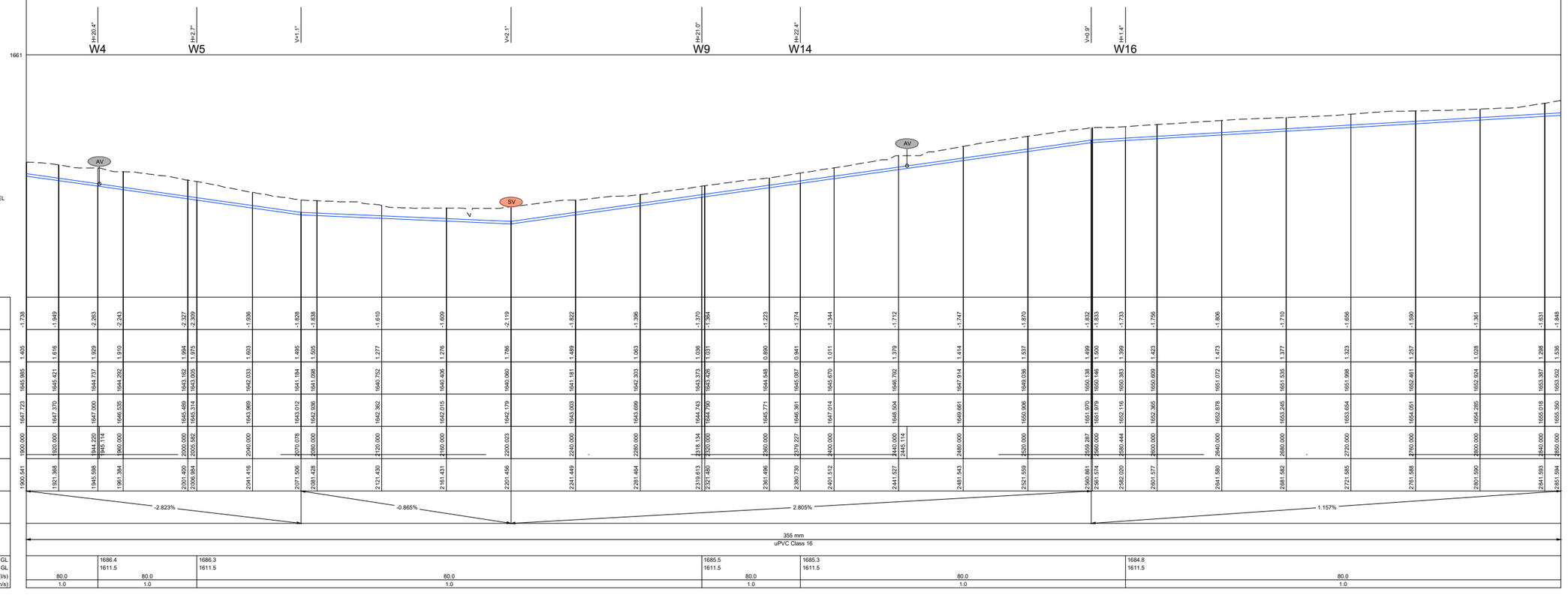
STATIC GL

SURFACE LEVEL

PIPELINE

SCALES:
Horizontal 1:1000
Vertical 1:200

Datum : 1631 m



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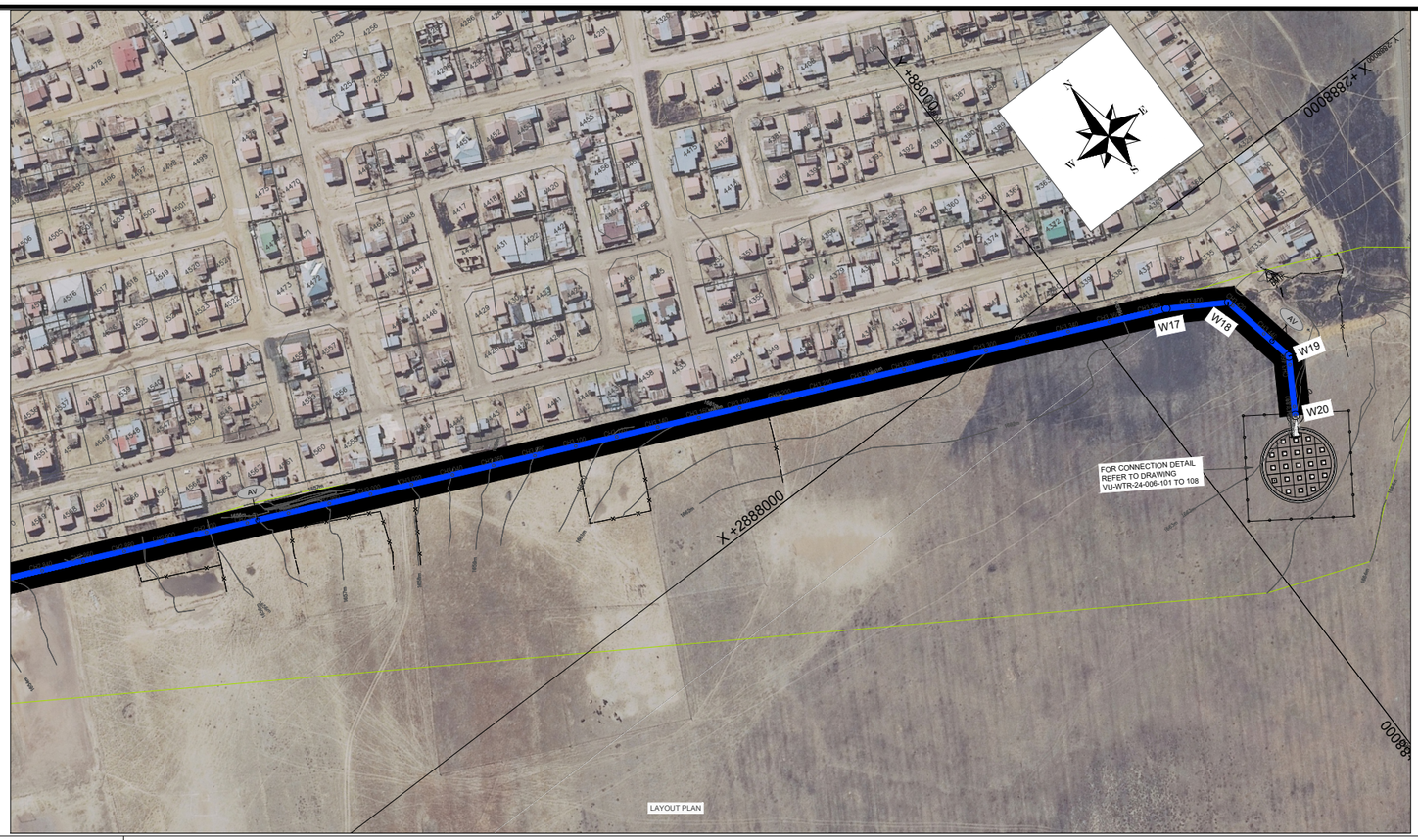

LEGEND:

- SV — SCOUR VALVE
- AV — AIR VALVE
- PROPOSED RESERVOIR
- PROPOSED PIPELINE 355 uPVC CLASS 16
- PUMPSTATION
- ROAD CROSSING

NOTES:

1. DEPTH TO INVERT = 1000mm + PIPE NOMINAL DIAMETER IN mm
2. DEPTH TO INVERT AT ROAD CROSSING = 1200mm + PIPE NOMINAL DIAMETER.
3. ALL PIPELINE ROAD CROSSINGS ARE AT 90 DEGREES TO THE ROAD CENTERLINE CONCERNED.

FUNDER:

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

Physical Address:
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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5

SILOBELA, EXTENSION 5 LONGSECTION (CH 2850 TO CH 3484.131)

RESPONSIBLE PERSONNEL		SIGNATURE
DESIGNED	M MLOTSHWA	
DRAWN	A SHANGASE	
CHECKED	L MTHEMBU	
APPROVED	S MNGADI (Pr Tech Eng)	
SCALE		

SIGNATURE DATE

CONTRACT NUMBER
ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	LS104

STAGE	SHEET SIZE	SHEET NO.	REVISION
TENDER	A0	4 OF 4	00

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Coordinate List		
Lo		
Extension 5		
Node	YLo	XLo
Const:		
W17	87 966.947	2 888 037.041
W18	87 941.454	2 888 052.609
W19	87 934.213	2 888 090.314
W20	87 948.947	2 888 114.442

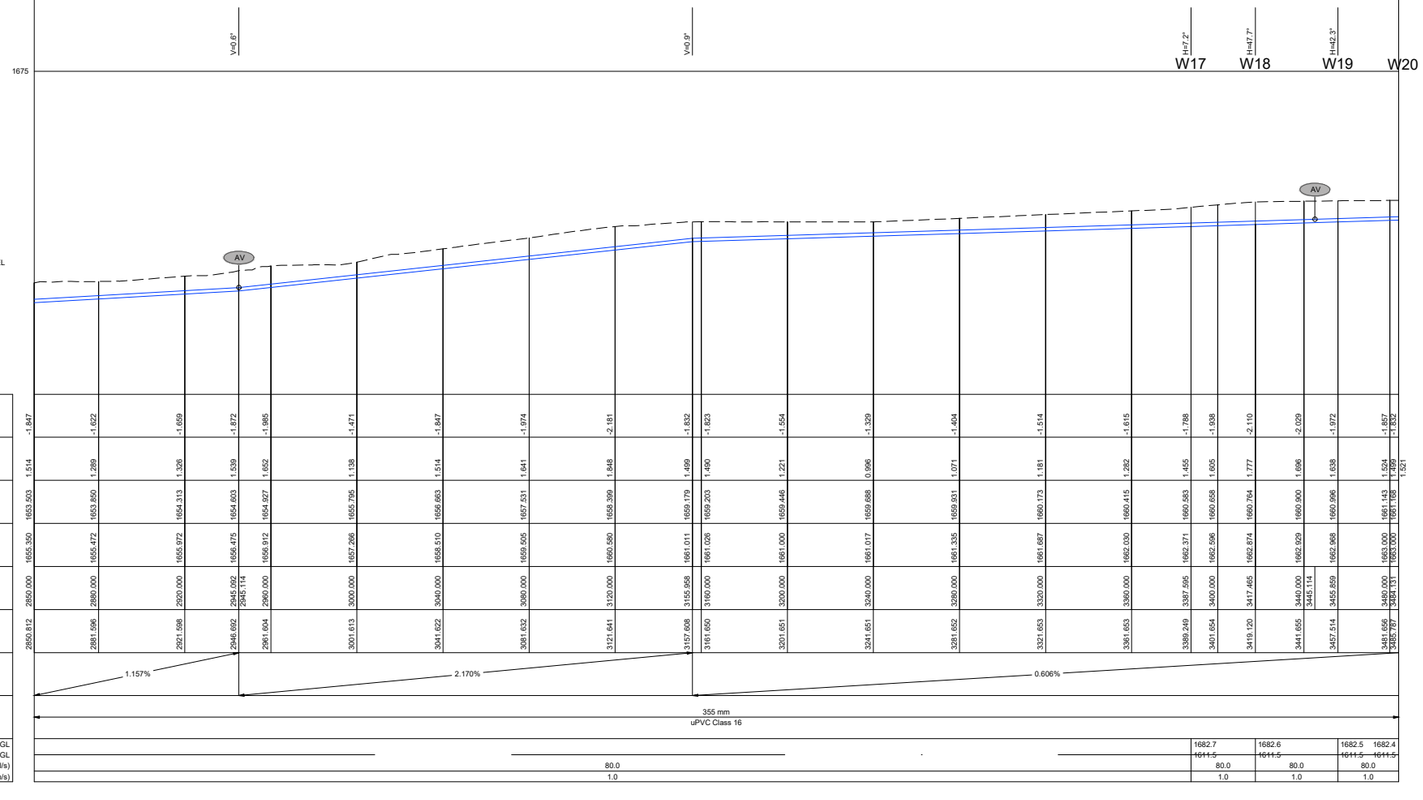
STATIC GL

SURFACE LEVEL

PIPELINE

SCALES:
Horizontal 1:1000
Vertical 1:200

Datum : 1645 m



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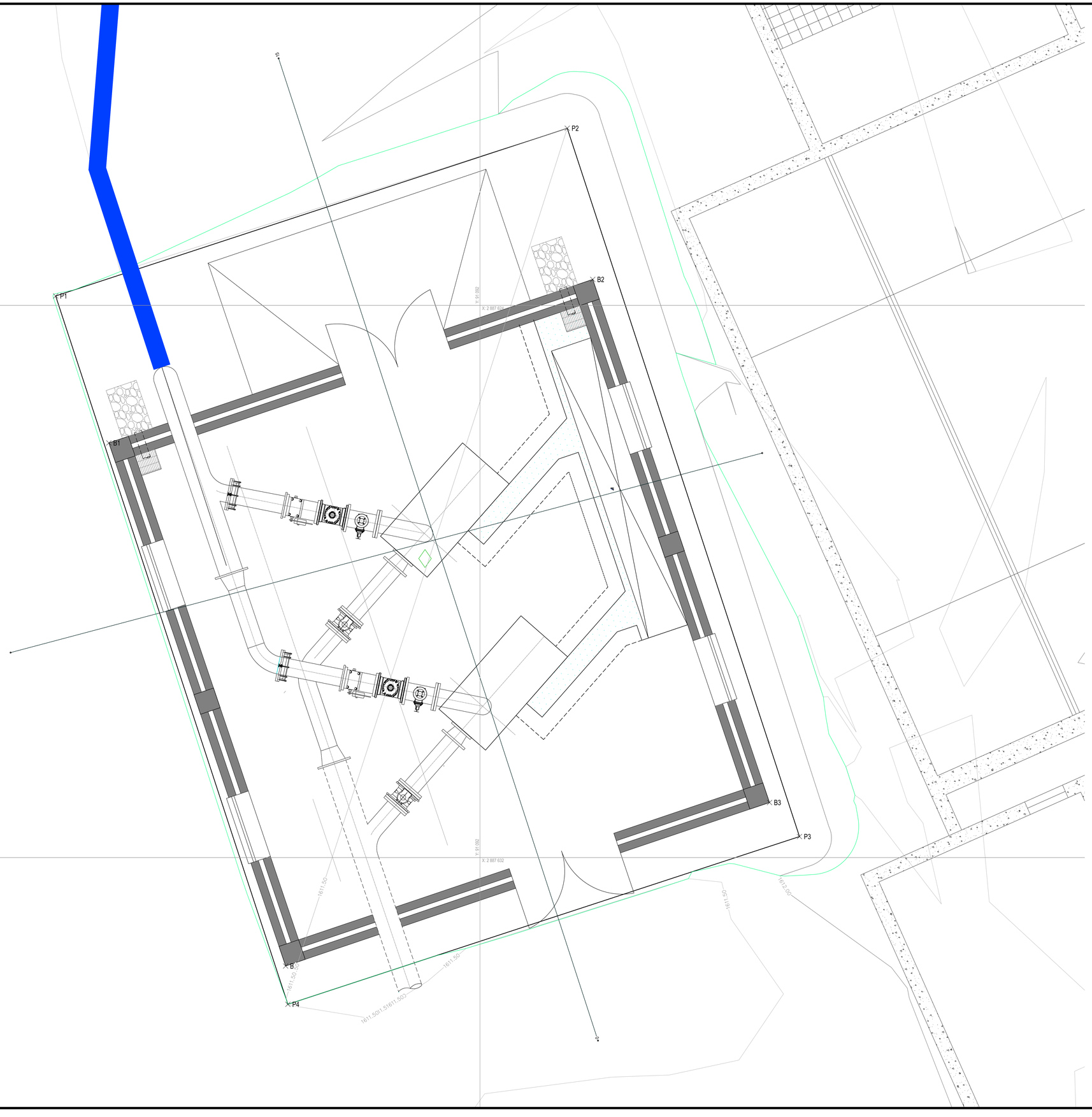

PLATFORMS SETTING OUT DATA			
POINT	Y	X	Z
P1	91 098.623	2 887 623.857	1611,450
P2	91 091.211	2 887 621.427	1611,500
P3	91 087.846	2 887 631.690	1611,550
P4	91 095.258	2 887 634.120	1611,500

BUILDING SETTING OUT DATA		
POINT	Y	X
B1	91 097.852	2 887 625.986
B2	91 090.842	2 887 623.617
B3	91 088.281	2 887 631.196
B4	91 095.291	2 887 633.565

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELAVANT DRAWINGS AND CONTRACT SPECIFICATIONS, ANY DISCREPANCIES TO BE BROUGHT TO ENGINEER'S ATTENTION PRIOR TO IMPLEMENTATION OF ANY WORK
2. CONTRACTOR TO KEEP A FULL SET OF DRAWINGS ON SITE.
3. CONTRACTOR IS RESPONSIBLE FOR CORRECT SETTING OUT OF BUILDINGS ON SITE WITH PARTICULAR INTEREST TO BOUNDARIES AND BUILDING LINES.
4. CONTRACTOR TO VERIFY ALL LEVELS AND DIMENSIONS ON SITE.
5. SCALING OF DRAWINGS IS NOT PERMITTED, FIGURED DIMENSIONS ONLY TO BE USED.
6. LARGE SCALE DETAILS ARE TO BE USED WHERE AVAILABLE.
7. CONTRACTOR TO IDENTIFY AND EXPOSE ALL UNDER GROUND SERVICES ON SITE.
8. WHERE RELEVANT, CONTRACT SPECIFICATIONS OR SABS 1200 TO APPLY.
9. CONSTRUCTION IS IN ACCORDANCE WITH ALL RELEVANT DRAWINGS.
10. WHEN THE ENGINEER IS REQUIRED ON SITE, 24 HOURS NOTICE SHOULD BE GIVEN.

CLIENT:

MUNICIPALITY · UMASIPALA WASEFETI LUTHULI

Physical Address:
28 Kerk Street,
Carolina,
1185

ENGINEER:

KUFANIKIWA CONSULTING

Physical Address:
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E-mail : info@kufanikiwa.co.za

Website Link or Address : www.kufanikiwa.co.za

DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

PUMPHOUSE SITE PLAN

RESPONSIBLE PERSONNEL		SIGNATURE
DESIGNED	M.MLOTSHWA	
DRAWN	A.SHANGASE	
CHECKED	P NYANDA	
APPROVED	S MNGADI (Pr Tech Eng)	
SCALE	AS SHOWN	

APPROVED : CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP 09/2022

PROJECT NUMBER		DRAWING NUMBER	
VU-WTR-24-005		P101	
STAGE	SHEET SIZE	SHEET NO	REVISION
TENDER	A0	1 of 2	00

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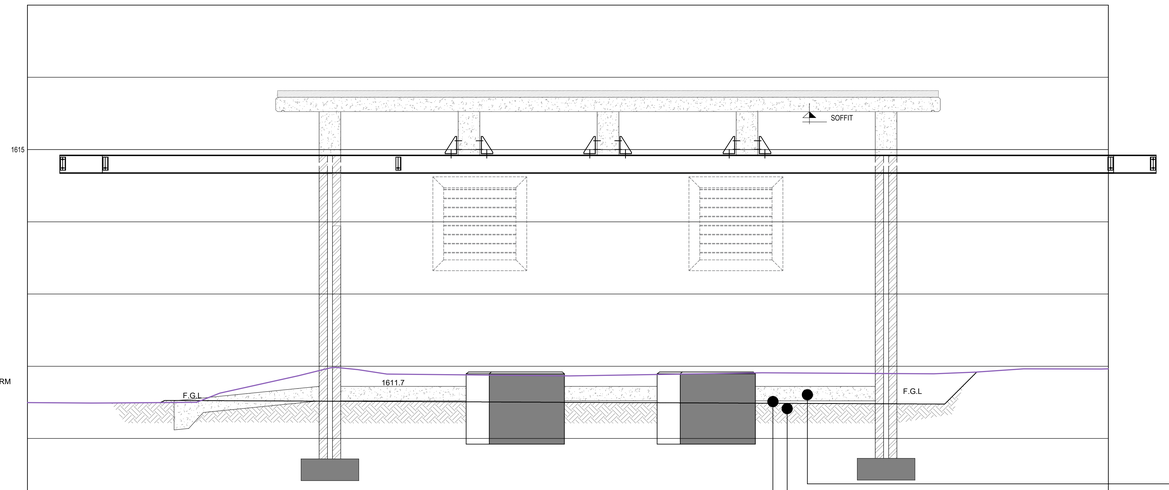


SCALES:
Horizontal 1:1000
Vertical 1:1000

DATUM 1610.000

CUT / FILL		-0.029	0.181	0.413	0.379	0.373	0.368	0.376	0.397	0.417	0.420	0.419	0.137	
CENTRE LINE (CL)	1611.526	1611.521	1611.517	1611.512	1611.508	1611.503	1611.498	1611.494	1611.489	1611.484	1611.480	1611.776	
GROUND LEVELS ON CL	1611.491	1611.498	1611.702	1611.930	1611.891	1611.881	1611.871	1611.874	1611.890	1611.906	1611.904	1611.898	1611.914	1611.964
DISTANCE (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14

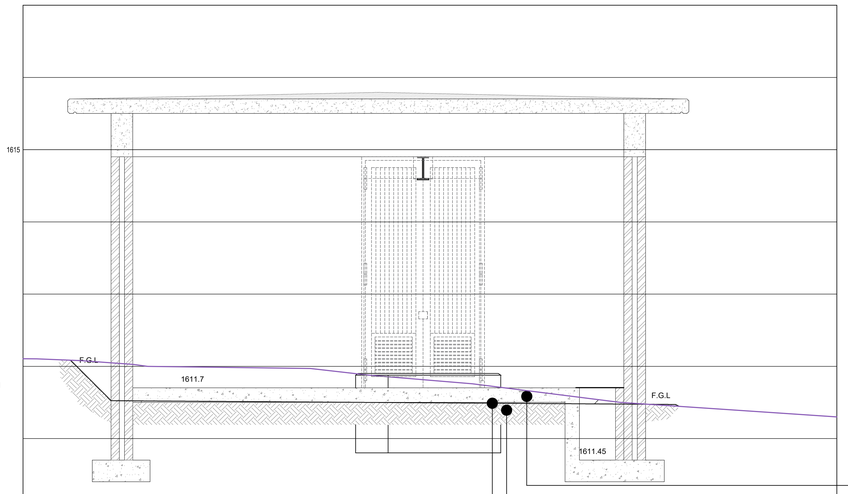
200MM FLOOR SLAB (35MPA/19MM)

300 G5 COMPACTED IN 150mm LAYERS TO 95% Mod AASHTO

10mm BITUMEN IMPREGNATED SOFTBORD. TOP 10mm TO BE RAKED OUT AND SEALED WITH APPROVED POLYSULPHIDE JOINT SEALANT.

LONGSECTION ALIGNMENT - 1
FROM 0.000 TO 14.965

SECTION Y-Y



SCALES:
Horizontal 1:1000
Vertical 1:1000

DATUM 1610.000

CUT / FILL	0.321	0.477	0.471	0.462	0.380	0.284	0.174	0.055	-0.022		
CENTRE LINE (CL)	1611.744	1611.519	1611.513	1611.506	1611.499	1611.493	1611.486	1611.479	1611.473		
GROUND LEVELS ON CL	1612.065	1611.996	1611.983	1611.968	1611.880	1611.776	1611.660	1611.524	1611.451	1611.394	1611.371
DISTANCE (m)	1	2	3	4	5	6	7	8	9	10	11

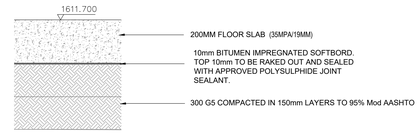
200MM FLOOR SLAB (35MPA/19MM)

300 G5 COMPACTED IN 150mm LAYERS TO 95% Mod AASHTO

10mm BITUMEN IMPREGNATED SOFTBORD. TOP 10mm TO BE RAKED OUT AND SEALED WITH APPROVED POLYSULPHIDE JOINT SEALANT.

LONGSECTION ALIGNMENT - 2
FROM 0.000 TO 11.267

SECTION X-X



TYPICAL LAYERWORKS DETAIL UNDER PUMPHOUSE FLOOR
SCALE: 1:10

NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELAVANT DRAWINGS AND CONTRACT SPECIFICATIONS, ANY DISCREPANCIES TO BE BROUGHT TO ENGINEER'S ATTENTION PRIOR TO IMPLEMENTATION OF ANY WORK
2. CONTRACTOR TO KEEP A FULL SET OF DRAWINGS ON SITE.
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5. SCALING OF DRAWINGS IS NOT PERMITTED, FIGURED DIMENSIONS ONLY TO BE USED.
6. LARGE SCALE DETAILS ARE TO BE USED WHERE AVAILABLE.
7. CONTRACTOR TO IDENTIFY AND EXPOSE ALL UNDER GROUND SERVICES ON SITE.
8. WHERE RELEVANT, CONTRACT SPECIFICATIONS OR SABS 1200 TO APPLY.
9. CONSTRUCTION IS IN ACCORDANCE WITH ALL RELEVANT DRAWINGS.
10. WHEN THE ENGINEER IS REQUIRED ON SITE, 24 HOURS NOTICE SHOULD BE GIVEN.

CLIENT:

Physical Address:
28 Kerk Street,
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1185

ENGINEER:

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

PLATFORM

RESPONSIBLE PERSONNEL		SIGNATURE
DESIGNED	M MLOTSHWA	
DRAWN	A SHANGASE	
CHECKED	P NYANDA	
APPROVED	S MNGADI (Pr Tech Eng)	
SCALE	1:30	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP 09/2022

PROJECT NUMBER		DRAWING NUMBER	
VU-WTR-24-005		P102	
STAGE	SHEET SIZE	SHEET NO	REVISION
TENDER	A0	2 of 2	00

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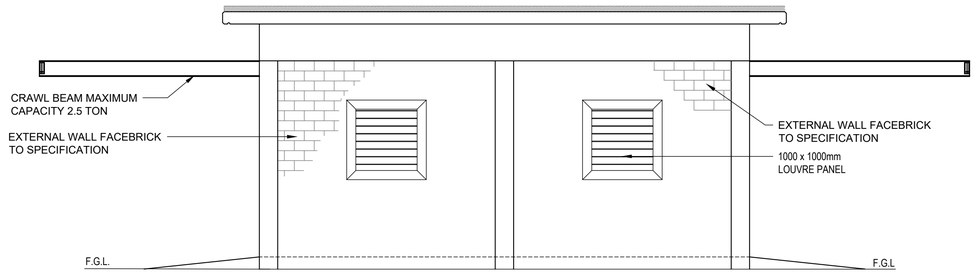
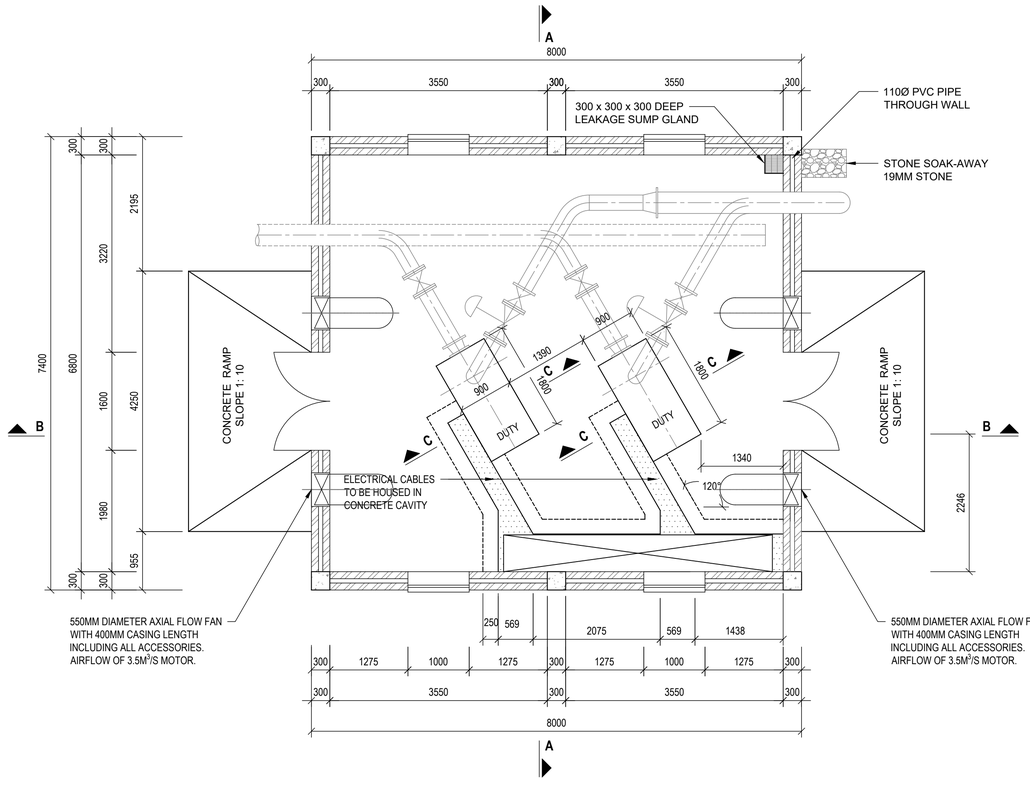
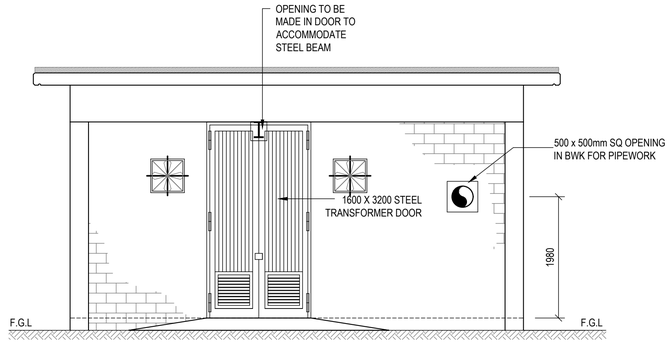


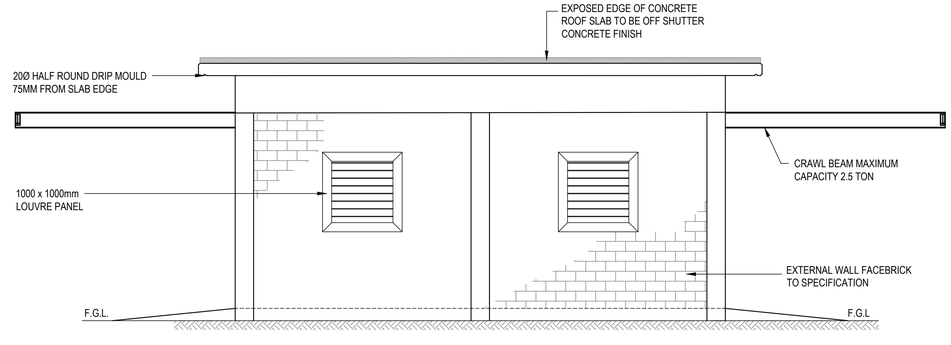
NORTH ELEVATION
SCALE: 1:50



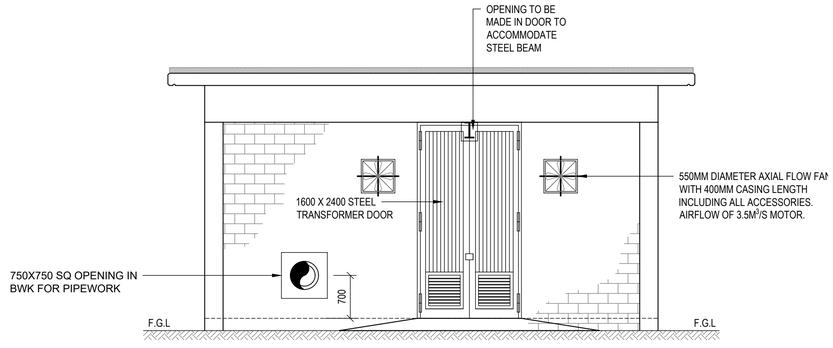
FLOOR PLAN
SCALE: 1:50



EAST ELEVATION
SCALE: 1:50



SOUTH ELEVATION
SCALE: 1:50



WEST ELEVATION
SCALE: 1:50

NOTES:

1. ALL DIMENSIONS, SETTING OUT & LEVELS TO BE CONFIRMED ON SITE BY THE CONTRACTOR PRIOR TO CONSTRUCTION OR FABRICATION.
2. ANY DISCREPANCIES WITH DIMENSIONS, SETTING OUT & LEVELS TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIETELY.

CLIENT:

ALBERT LUTHULI MUNICIPALITY

Physical Address:
28 Kerk Street,
Carolina,
1185

ENGINEER:

KUFANIKIWA CONSULTING

Physical Address:
Derby Downs Office Park
11 Derby Place
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Postal Address:
Suite 208,
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Tel : (031) 701 1038
Fax : (031) 701 0963
E-mail : info@kufanikiwa.co.za

Website Link or Address : www.kufanikiwa.co.za

DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO
SILOBELA, EXTENTION 5

DRAWING TITLE:

PUMPSTATION PLANS
& ELEVATIONS

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	K JAGARNATH (Pr Tech Eng)	
DRAWN	A POTE	
CHECKED	K JAGARNATH (Pr Tech Eng)	
APPROVED	K JAGARNATH (Pr Tech Eng)	
SCALE	AS SHOWN	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER
ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER		
VU-WTR-24-005	S201		
STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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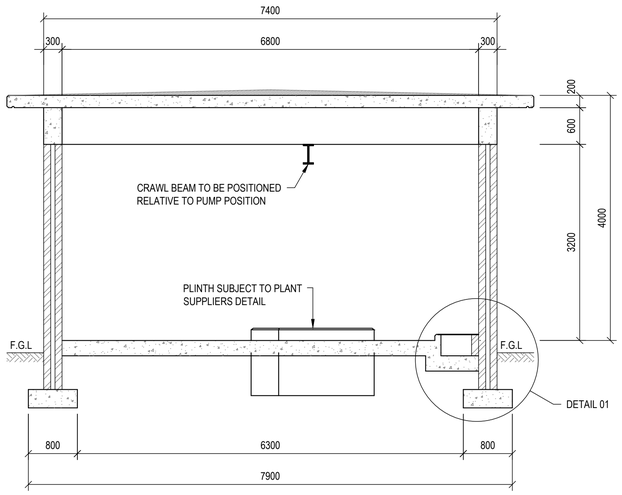
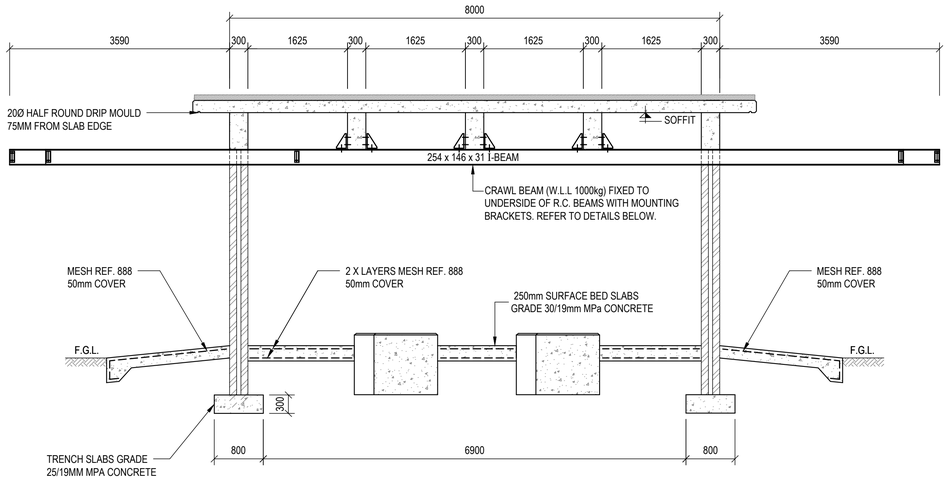
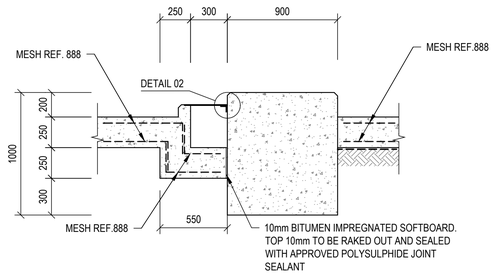


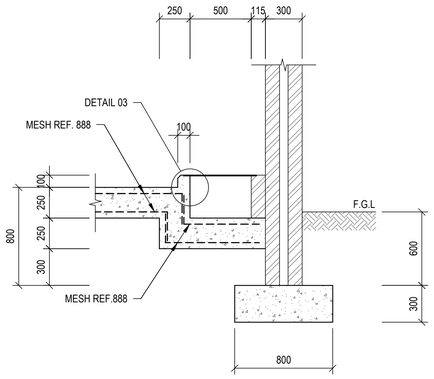
SECTION A-A
SCALE: 1:50



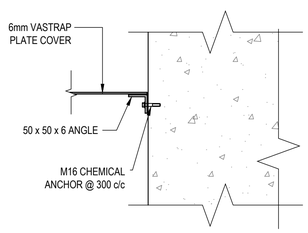
SECTION B-B
SCALE: 1:50



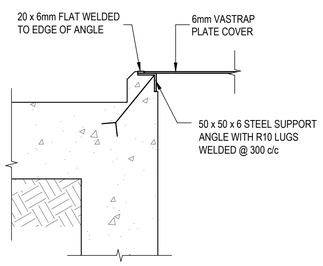
SECTION C-C
SCALE: 1:25



DETAIL 01
SCALE: 1:25



DETAIL 02
SCALE: 1:-10



DETAIL 03
SCALE: 1:10

NOTES:

1. ALL DIMENSIONS, SETTING OUT & LEVELS TO BE CONFIRMED ON SITE BY THE CONTRACTOR PROIR TO CONSTRUCTION OR FABRICATION.
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Fax : (031) 701 0963
E-mail : info@kufanikiwa.co.za

Website Link or Address : www.kufanikiwa.co.za

DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

PUMPSTATION SECTIONS & DETAILS

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	K JAGARNATH (Pr Tech Eng)	
DRAWN	A POTE	
CHECKED	K JAGARNATH (Pr Tech Eng)	
APPROVED	K JAGARNATH (Pr Tech Eng)	
SCALE	AS SHOWN	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER
ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER		
VU-WTR-24-005	S202		
STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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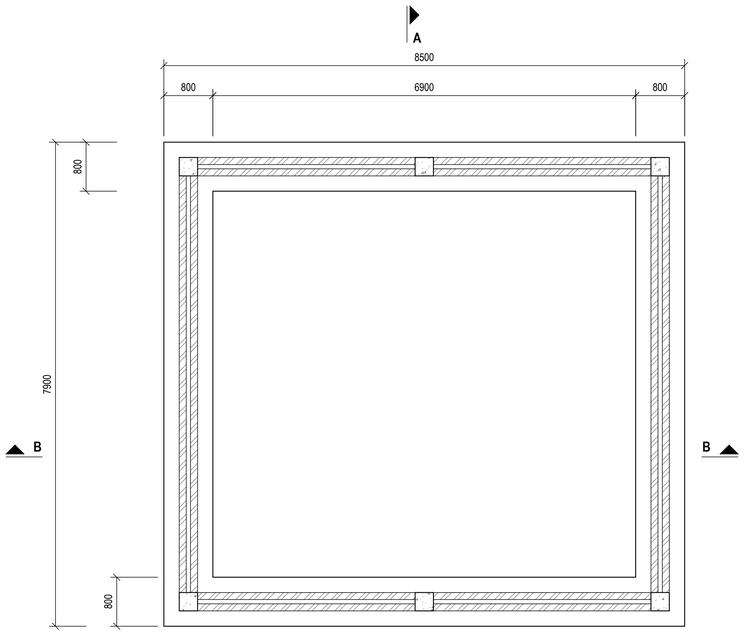
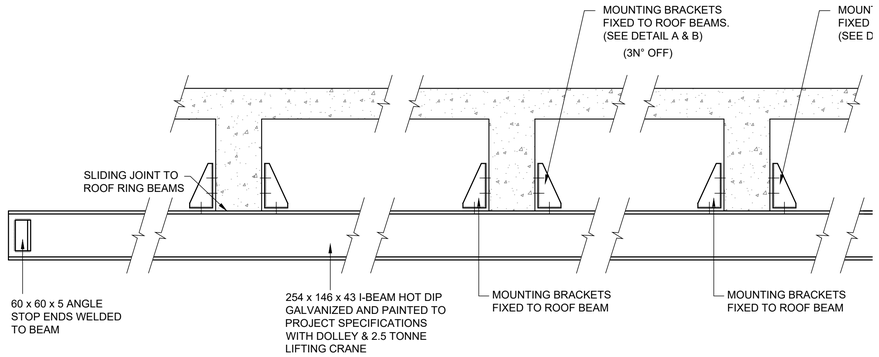
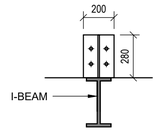
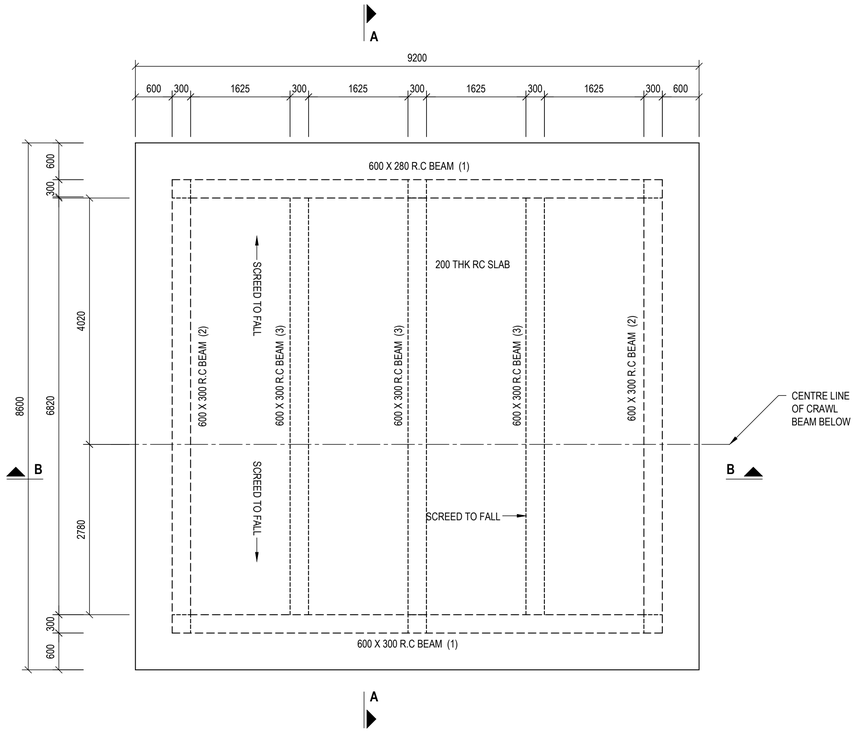




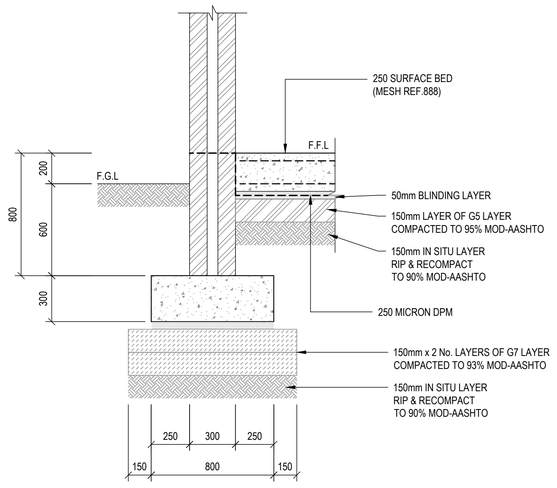
SIDE ELEVATION
SCALE: 1:20



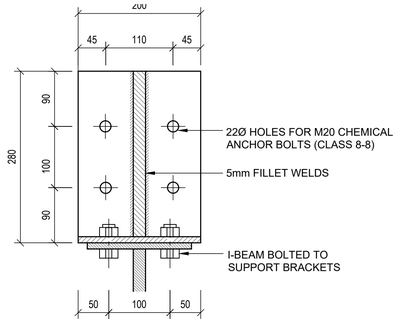
END ELEVATION
SCALE: 1:20



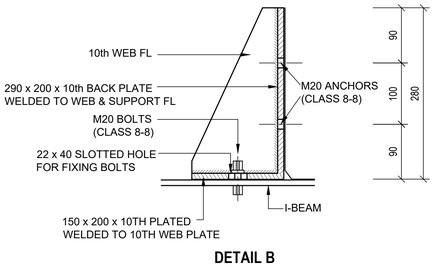
ROOF SLAB PLAN
SCALE: 1:50



TYPICAL LAYER WORKS
SCALE: 1:20



DETAIL A
SCALE: 1:5



DETAIL B
SCALE: 1:5

NOTES:

1. ALL DIMENSIONS, SETTING OUT & LEVELS TO BE CONFIRMED ON SITE BY THE CONTRACTOR PROIR TO CONSTRUCTION OR FABRICATION.
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E-mail : info@kufanikiwa.co.za

Website Link or Address : www.kufanikiwa.co.za

DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

FOUNDATION LAYOUT, ROOF PLAN & BEAM DETAILS

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	K JAGARNATH (Pr Tech Eng)	
DRAWN	A POTE	
CHECKED	K JAGARNATH (Pr Tech Eng)	
APPROVED	K JAGARNATH (Pr Tech Eng)	
SCALE	AS SHOWN	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER

ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER		
VU-WTR-24-005	S203		
STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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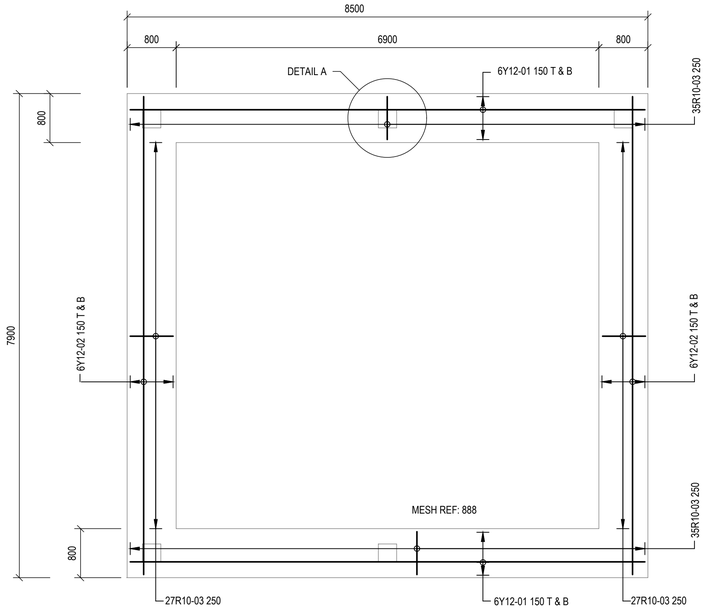
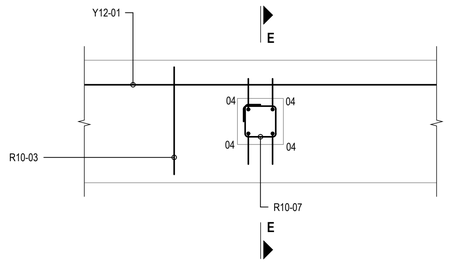
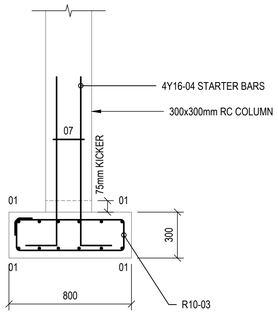


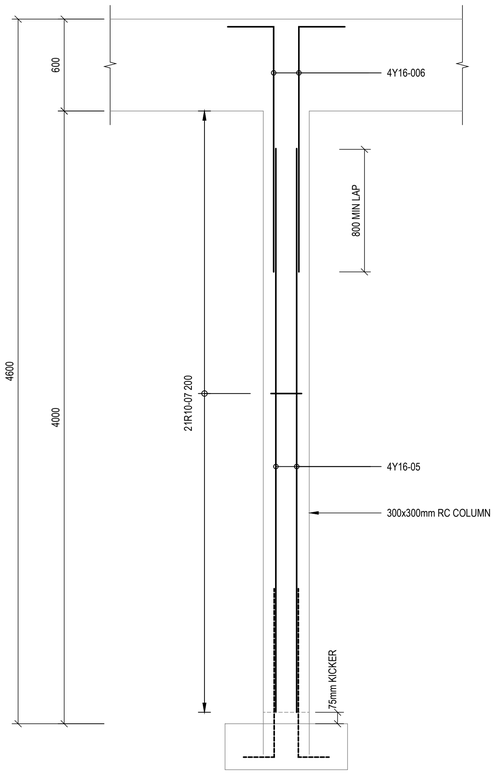
PLAN ON FOUNDATION REINFORCING
SCALE: 1:50



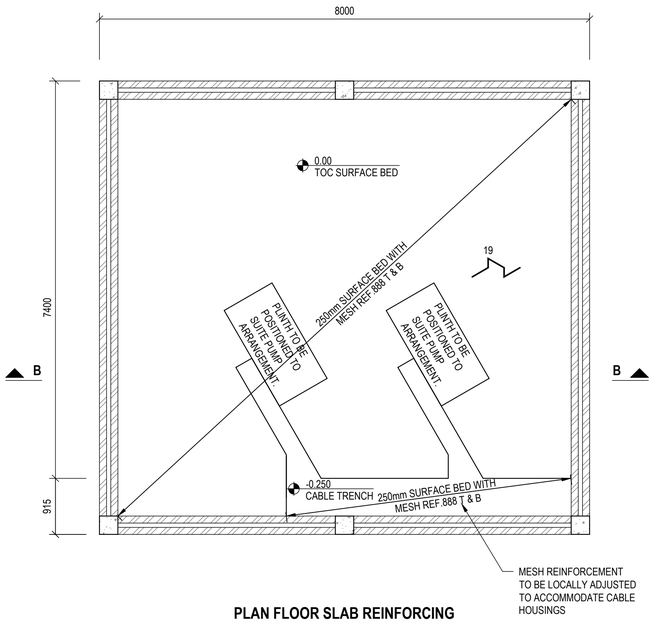
DETAIL A:
PLAN ON COLUMN STARTER BARS
SCALE: 1:20



SECTION E-E
SCALE: 1:20



COLUMN ELEVATION
SCALE: 1:20



PLAN FLOOR SLAB REINFORCING
SCALE: 1:50

NOTE: STOOLS TO BE PLACED AT 650 c/c

BENDING SCHEDULE (SANS 282:2011)

MEMBER		REINFORCEMENT					BENDING					
UNIT	No.	Diameter	Mark	Unit	Total	Length	*Shape Code*	A	B	C	D	E/r
STRIP FOOTING	1	Y12	**01**	24	24	8400	*20*	8400				
		Y12	**02**	24	24	7800	*20*	7800				
		R10	**03**	124	124	1940	*60*	200	700			

		06	08	10	12	16	20	25	32	40	Totals
Length (m)	R			240.560							240.560
	Y				388.800						388.800
Weight (ton)	R			0.148							0.148
	Y				0.345						0.345
										Total Weight (ton):	**0.49**

BENDING SCHEDULE (SANS 282:2011)

MEMBER		REINFORCEMENT					BENDING					
UNIT	No.	Diameter	Mark	Unit	Total	Length	*Shape Code*	A	B	C	D	E/r
COLUMNS	6	Y16	**04**	4	24	1260	*37*	200	1100			
		Y16	**05**	4	24	3680	*20*	3680				
		Y16	**06**	4	24	1860	*37*	300	1600			
		R10	**07**	21	126	940	*60*	200	200			

		06	08	10	12	16	20	25	32	40	Totals
Length (m)	R			118.440							118.440
	Y					163.200					163.200
Weight (ton)	R			0.073							0.073
	Y					0.258					0.258
										Total Weight (ton):	**0.33**

BENDING SCHEDULE (SANS 282:2011)

MEMBER		REINFORCEMENT					BENDING					
UNIT	No.	Diameter	Mark	Unit	Total	Length	*Shape Code*	A	B	C	D	E/r
FLOOR SLAB	1	R10	**19**	132	132	1120	*83*	300	150	300	300	

		06	08	10	12	16	20	25	32	40	Totals
Length (m)	R			147.840							147.840
	Y										0.000
Weight (ton)	R			0.091							0.091
	Y										0.000
										Total Weight (ton):	**0.09**

NOTE:
MINIUMUM COVER
STRIP FOOTINGS : 50mm
COLUMN BASES : 50mm
COLUMNS : 50mm
BEAMS : 50mm

NOTES:

1. ALL DIMENSIONS, SETTING OUT & LEVELS TO BE CONFIRMED ON SITE BY THE CONTRACTOR PROIR TO CONSTRUCTION OR FABRICATION.
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ENGINEER:

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Website Link or Address : www.kufanikiwa.co.za

DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

FOUNDATION, FLOOR SLAB, COLUMN REINFORCEMENT AND BENDING SCHEDULES

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	K JAGARNATH (Pr Tech Eng)	
DRAWN	A POTE	
CHECKED	K JAGARNATH (Pr Tech Eng)	
APPROVED	K JAGARNATH (Pr Tech Eng)	
SCALE	AS SHOWN	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER
ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	SR301

STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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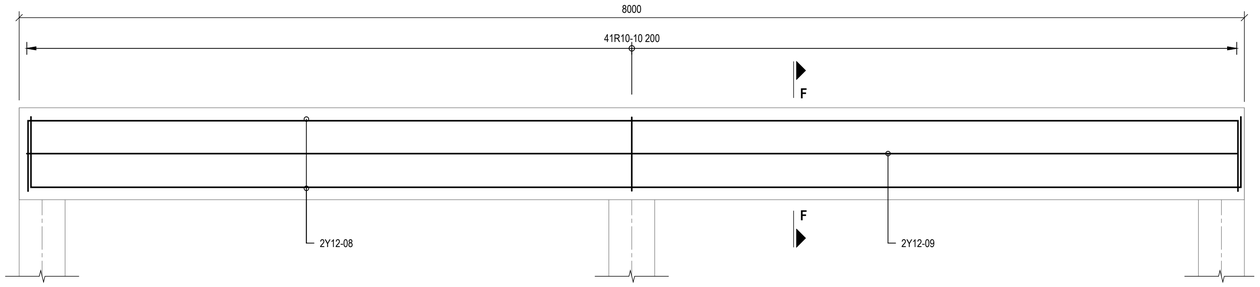
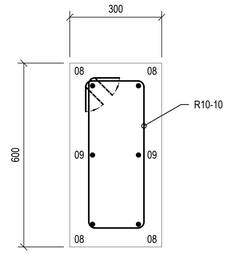
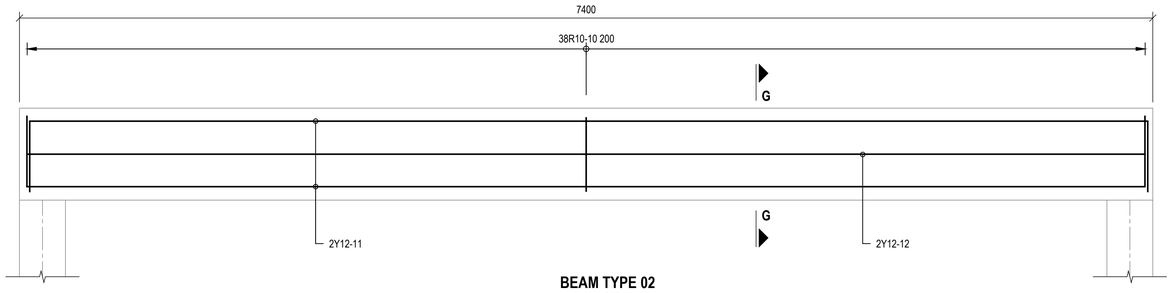


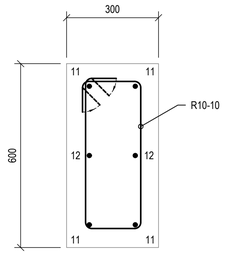
BEAM TYPE 01
SCALE: 1:20



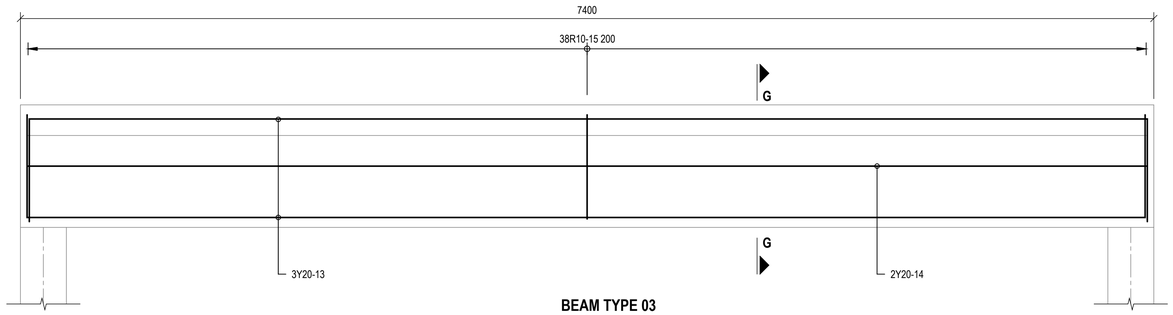
SECTION F-F
(RING BEAM TYPE 01)
SCALE: 1:10



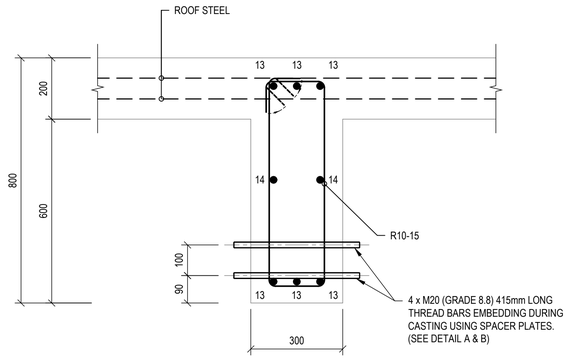
BEAM TYPE 02
SCALE: 1:20



SECTION G-G
(RING BEAM TYPE 02)
SCALE: 1:10



BEAM TYPE 03
SCALE: 1:20



SECTION H-H
(RING BEAM TYPE 03)
SCALE: 1:10

BENDING SCHEDULE (SANS 282:2011)

MEMBER		REINFORCEMENT					BENDING					
UNIT	No.	Diameter	Mark	Unit	Total	Length	*Shape Code*	A	B	C	D	E/r
BEAM TYPE 01	2	Y12	**08**	4	8	8760	*38*	460	7900	460		
		Y12	**09**	2	4	7900	*20*	7900				
		R10	**10**	41	82	1460	*60*	480	180			
BEAM TYPE 02	2	R10	**10**	38	76	1460	*60*	480	180			
		Y12	**11**	4	8	8160	*38*	460	7300	460		
		Y12	**12**	2	4	7300	*20*	7300				
BEAM TYPE 03	3	Y20	**13**	6	18	8510	*38*	670	7300	640		
		Y20	**14**	2	6	7300	*20*	7300				
		R10	**15**	38	114	1860	*60*	680	180			

		06	08	10	12	16	20	25	32	40	Totals
Length (m)	R			442.720							442.720
	Y				196.160		196.980				393.140
Weight (ton)	R			0.273							0.273
	Y				0.174		0.487				0.661
										Total Weight (ton):	**0.93**

NOTE:
MINIMUM COVER
STRIP FOOTINGS : 50mm
COLUMN BASES : 50mm
COLUMNS : 50mm
BEAMS : 50mm

NOTES:

1. ALL DIMENSIONS, SETTING OUT & LEVELS TO BE CONFIRMED ON SITE BY THE CONTRACTOR PROIR TO CONSTRUCTION OR FABRICATION.
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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

BEAM REINFORCEMENT AND BENDING SCHEDULE

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	K JAGARNATH (Pr Tech Eng)	
DRAWN	A POTE	
CHECKED	K JAGARNATH (Pr Tech Eng)	
APPROVED	K JAGARNATH (Pr Tech Eng)	
SCALE	AS SHOWN	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER
ALMP09/2022

PROJECT NUMBER	DRAWING NUMBER
VU-WTR-24-005	SR302

STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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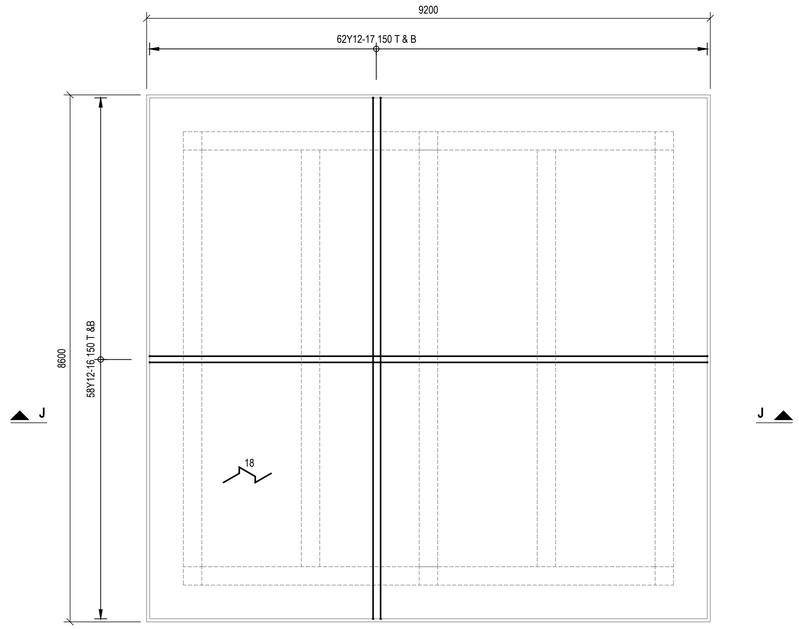
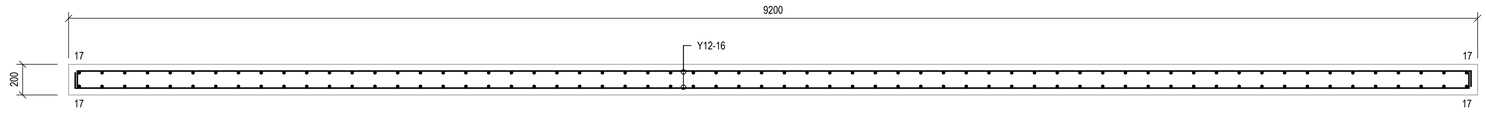


ROOF SLAB PLAN
SCALE: 1:50

NOTE: STOOLS TO BE PLACED AT 650 c/c



SECTION J-J
SCALE: 1:20

BENDING SCHEDULE (SANS 282:2011)

MEMBER		REINFORCEMENT					BENDING					
UNIT	No.	Diameter	Mark	Unit	Total	Length	*Shape Code*	A	B	C	D	E/r
ROOF SLAB	1	Y12	**16**	116	116	9240	*38*	100	9100	100		
		Y12	**17**	124	124	8640	*38*	100	8500	100		
		R10	**18**	182	182	1020	*83*	300	100	300	300	

		06	08	10	12	16	20	25	32	40	Totals
Length (m)	R			185.640							185.640
	Y				2,143.200						2,143.200
Weight (ton)	R			0.115							0.115
	Y				1.903						1.903
										Total Weight (ton):	**2.02**

NOTE:
MINIMUM COVER
STRIP FOOTINGS : 50mm
COLUMN BASES : 50mm
COLUMNS : 50mm
BEAMS : 50mm

NOTES:

1. ALL DIMENSIONS, SETTING OUT & LEVELS TO BE CONFIRMED ON SITE BY THE CONTRACTOR PROIR TO CONSTRUCTION OR FABRICATION.
2. ANY DISCREPANCIES WITH DIMENSIONS, SETTING OUT & LEVELS TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDITELY.

CLIENT:

ALBERT LUTHULI MUNICIPALITY

Physical Address:
28 Kerk Street,
Carolina,
1185

ENGINEER:

KUFANIKIWA CONSULTING

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DRAWING REVISION

REV	BY	DESCRIPTION	DATE

PROJECT NAME:

BULK WATER SUPPLY TO SILOBELA, EXTENTION 5

DRAWING TITLE:

ROOF SLAB REINFORCEMENT AND BENDING SCHEDULE

RESPONSIBLE PERSONNEL.		SIGNATURE
DESIGNED	K.JAGARNATH (Pr Tech Eng)	
DRAWN	A POTE	
CHECKED	K.JAGARNATH (Pr Tech Eng)	
APPROVED	K.JAGARNATH (Pr Tech Eng)	
SCALE	AS SHOWN	

APPROVED ; CLIENT

SIGNATURE DATE

CONTRACT NUMBER
ALMP09/2022

PROJECT NUMBER		DRAWING NUMBER	
VU-WTR-24-005		SR303	
STAGE	SHEET SIZE	SHEET No.	REVISION
TENDER	A1	1 of 1	00

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Annexure C: GEOTECHNICAL REPORT

BAV CONSULTING

GEOTECH & GEOHYDROLOGY CONSULTING SERVICES

CONSTRUCTION OF CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5, MPUMALANGA

MARCH 2025

OUR REFERENCE: BAV/GEOTECH/034

Prepared For:

KUFANIKIWA CONSULTING

KUFANIKIWA CONSULTING

BAV CONSULTING
GEOTECH & GEOHYDROLOGY CONSULTING SERVICES

VERIFICATION PAGE

Rev 00

TITLE:
CONSTRUCTION OF CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5, MPUMALANGA.

BAV CONSULTING REF. NO.	**DATE:**	**DOCUMENT:**
BAV/GEOTECH/034	19/05/2025	FINAL REPORT

CARRIED OUT BY:	**COMMISSIONED BY:**
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AUTHOR Mr T Ndaba	**CLIENT CONTACT PERSON** Mr M Mlotshwa

SYNOPSIS

CONSTRUCTION OF CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5, MPUMALANGA.

Commissioned by:	**Capacity**	**Signature**	**Date**
T Ndaba	Geologist (Cert.Sci.Nat)		19/05/2025
M Nkwane	Geologist (Pr.Sci .Nat)		19/05/2025

CONSTRUCTION OF CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5, MPUMALANGA.

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1 INTRODUCTION

BAV Consulting was appointed by KUFANIKIWA CONSULTING to conduct a geotechnical investigation for CONSTRUCTION OF CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5, MPUMALANGA. A materials investigation was undertaken for the proposed upgrade, located in Silobela area Extension 5, which is under, Chief Albert Luthuli Local Municipality, Gert Sibande District Municipality.

This report presents the results of material investigation undertaken for the proposed upgrade works, the detailed design of the pipeline, entailing an assessment of the subsurface conditions along the pipeline route and excavation conditions. The investigation comprised of a desk study of available information such as geological maps covering the area, site walk-over and test pitting, collection of samples for laboratory testing and reporting.

The fieldwork was conducted from the 27th of March 2025 with the following objectives:

- To describe the investigation procedure.
- To provide an overview of the geology of the site.
- Discuss the soil profiles encountered.
- Comments on the groundwater conditions.
- To characterizes the soil properties based on the results of laboratory testing.
- Comment on the excavatability of the subsoil.
- Identify and discuss potential problematic geotechnical considerations (if any).

Twelve (No.12) test pits were mechanically excavated on site and profiled by an engineering geologist in accordance with acceptable South African standards such as the SANS 633:2009, Profiling, and percussion and core borehole logging in Southern Africa for engineering purposes.

Disturbed subsoil samples were recovered and submitted to a commercial laboratory for testing to determine the properties of the materials. Tests conducted included:

- Foundation Indicator (Grading, Atterberg Limits and Linear Shrinkage and hydrometer).
- Maximum Dry Densities (AASHTO) and Optimum Moisture Contents.
- California Bearing Ration (CBR).
- PH

The objectives of the investigation are to characterize the subsurface conditions in terms of excavation conditions, stability of excavations, subgrade conditions, groundwater as well as material usage and founding conditions along the proposed pipeline route.

2 AVAILABLE INFORMATION

The information available comprised of the following:

- Site location provided by KUFANIKIWA.

3 SITE SETTING

3.1 Site Location and Description

Silobela is a township located just outside Carolina in the Mpumalanga province of South Africa. It falls under the jurisdiction of the Albert Luthuli Local Municipality within the Gert Sibande District. Its proximity to Carolina suggests access to various services and amenities available in the larger town. Carolina serves as a regional hub, providing educational institutions, healthcare facilities, and commercial centres that likely benefit residents of Silobela. The Chief Albert Luthuli Local Municipality is the Water Services Authority for the area. A simple illustration of the location is shown in figure below.

The area characterized by gently rolling terrain with elevations typically ranging between 1,500 and 1,700 meters above sea level.

Figure 1: Locality Map

3.2 Published Geology

According to the 1:250 000, 2630 Geological Map, the regional geology of the area comprises of sedimentary rocks of the Karoo Supergroup, Common rock types include sandstone, Siltstones, shale, and coal seams. Dolerite sills and dykes are common in the region due to extensive igneous activity during the breakup of Gondwana. These are overlain by Quaternary sands which are predominant in this area. Typical of regions with weathered Karoo sediments. The site under investigation is dominated by Silty residual sands. Figure 2 shows the geological map of the area.

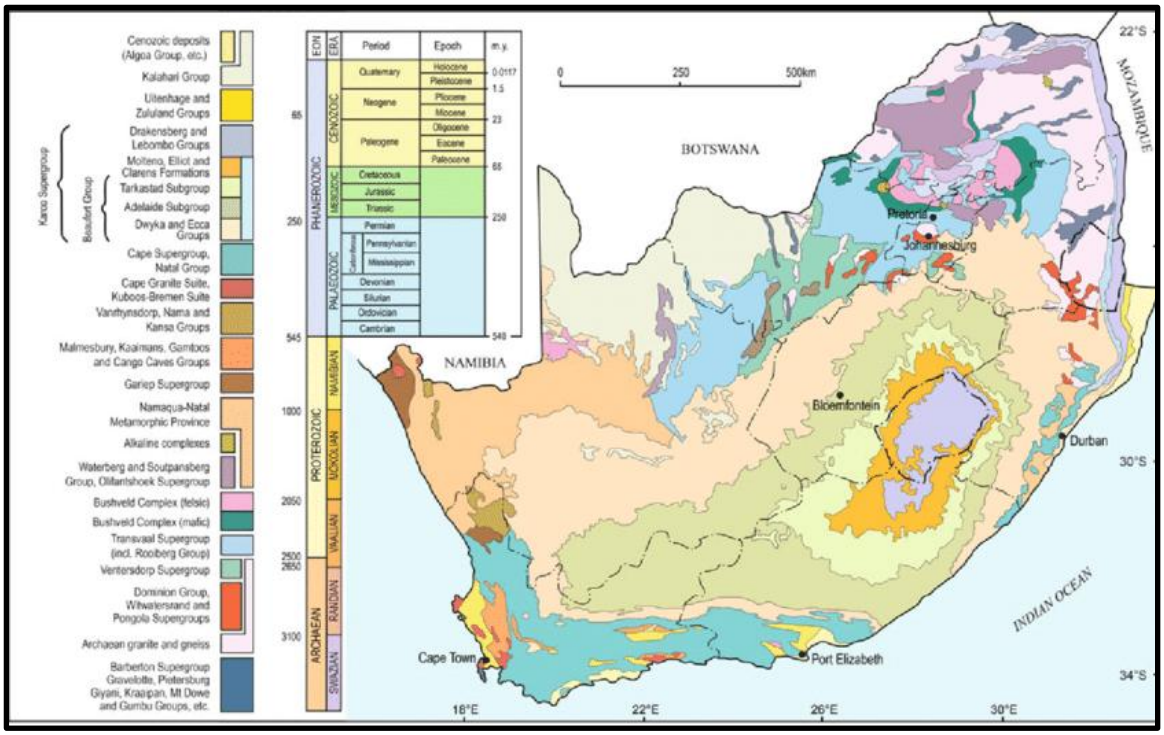


Figure 2: Geological Map of the area

3.3 Climate

Summer (October–March)

- Warm to hot during the day, with cooler nights. Average daytime highs: 24°C to 30°C. Thunderstorms are frequent in the afternoon and early evening. Most of the annual rainfall occurs during this period with 80–120 mm in peak months (Dec–Feb)

Winter (May–August)

- Dry and cold, especially at night. Daytime temperatures: 16°C to 22°C. Nighttime lows: Often fall below 0°C, with frost common. Clear skies and low humidity dominate.

Annual Rainfall

- Ranges between 700 mm and 1,000 mm, mostly from November to March.

Wind and Air Quality

- Moderate winds throughout the year, stronger in spring.

Air quality is affected by nearby coal mining operations, especially during dry, still winter months, when particulate matter can accumulate. This climate is conducive to agriculture and outdoor activities, although water resources may be affected during extended dry periods in winter.Based on the macro-climatic regions as depicted in Figure 3, the site can be classified as **moderate to wet climate** with an approximate Weinert N-value of 2-5.

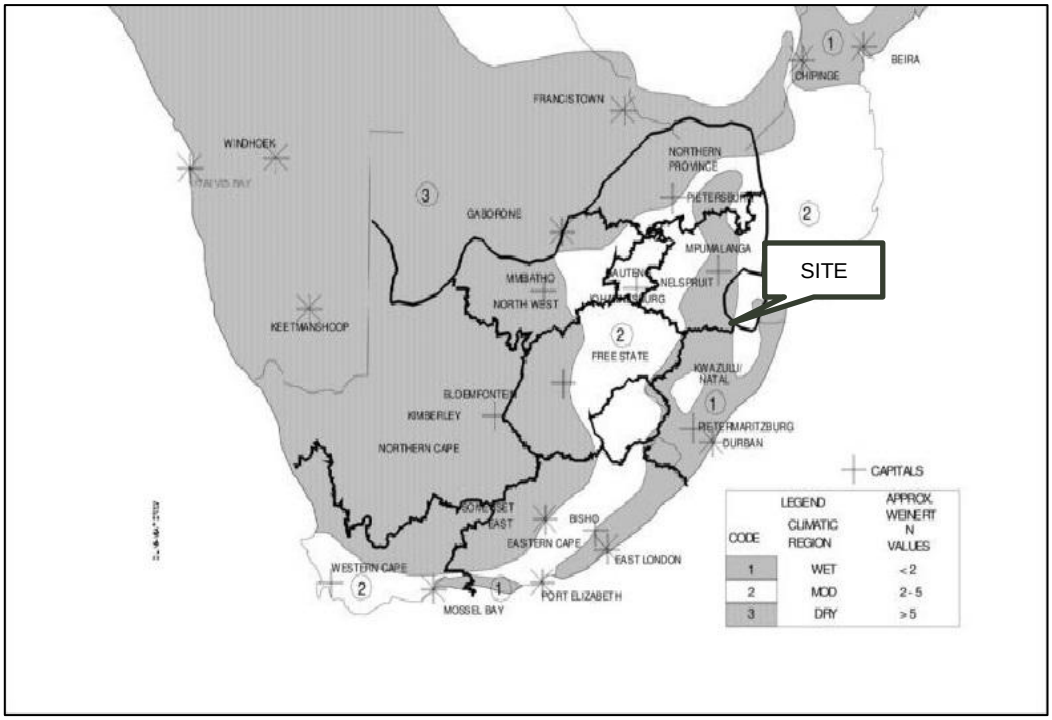


Figure 3: Macro-climatic regions of southern African (Weinert, 1980)

3.4 Proposed Development

- CONSTRUCTION OF CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5.

4 SITE INVESTIGATION METHODOLOGY

The investigation carried out on the 27th of March 2025 comprised the excavation of Twelve (No.12) test pits across the site. All test pits were excavated on the Client's suggested positions. These were excavated to 1m/or refusal depth for Pipeline route and 1.6m for Reservoir Positions.

The position of each test pit was recorded using a hand-held GPS. Soil profiling was conducted by an engineering geologist in accordance with acceptable standards such as SANS 633:2009, Profiling, and percussion and core borehole logging in Southern Africa for engineering purposes. Representative samples were recovered from the test pits and taken to a commercial laboratory for testing. Table 1: **below shows the summary of the test pits. Refer to Annexure B for Logs.**

4.1 Test Pit Positions

Table 1: Summary of test pits positions

Site	Position	Depth(m)	Seepage	Sidewall Collapse	Latitude	Longitude
Carolina Bulk Water Supply to Silobela Extension 5	TP1	1.00	NO	NO	-26.093592°	30.089516°
	TP2	1.00	NO	NO	-26.090532°	30.092785°
	TP3	1.00	NO	YES	-26.088541°	30.096778°
	TP4	1.00	NO	NO	-26.090387°	30.101358°
	TP5	1.00	YES	NO	-26.092355°	30.105923°
	TP6	1.00	NO	NO	-26.094253°	30.110584°

	TP7	1.00	NO	NO	-26.096256°	30.115081°
	TP8	1.00	NO	NO	-26.098202°	30.119647°
	Reservoir TP1	1.60	YES	YES	-26.099095°	30.120779°
	Reservoir TP2	1.60	YES	YES	-26.099169°	30.120728°
	Reservoir TP3	1.60	YES	YES	-26.099107°	30.120941°
	Reservoir TP4	1.60	YES	YES	-26.099177°	30.120899°

4.1.1 DCP Test Results

DCP tests were conducted at each test pit site and the results are summarised below. An 8kg DCP test machine was used to evaluate the subsoil consistency and the in-situ California Bearing Ratio (CBR). It should be noted that the results of the DCP tests are affected by the moisture content of the soil profile, as well as any rock pebbles or cobbles below that promote DCP refusal Full DCP results are included in Annexure C of this report.

Table 2: Summary of DCP test results

DCP Number	CBR values (%)				
	200	400	600	800	1000
TP1 DCP	3	4	5	2	2
TP2 DCP	3	3	3	6	4
TP3 DCP	2	2	2	7	7
TP4 DCP	6	8	15	22	45
TP5 DCP	2	6	4	7	7
TP6 DCP	8	8	8	7	11
TP7 DCP	3	6	11	8	8
TP8 DCP	5	1	1	2	2
RTP1 DCP	6	1	1	2	2
RTP2 DCP	4	1	1	2	2
RTP3 DCP	3	3	1	3	3
RTP4 DCP	6	6	1	3	3

The DCP results show CBR values that are very low throughout the investigated route. Very low CBR values can be associated with pockets of soil material. The results are attached on **Annexure C.**

5 GROUNDWATER & SIDEWALL COLLAPSES

Groundwater Seepages and Side wall Collapses were encountered on TP3 and TP4 together with all four reservoir test pits during this investigation.

6 LABORATORY TEST RESULTS

Disturbed subsoil samples were taken to a commercial laboratory for:

- Foundation/road indicator tests (grading and Atterberg limits including hydrometer);
- Compaction tests (Maximum Dry density, Optimum Moisture Content and California Bearing Ratio)
- PH

Table 3: Summary of foundation indicator test results

Pit No	Depth (mm)	Particle Size %				Atterberg Limits %			GM	AASHTO/ USCS classification
		Clay & Silt	Fine Fine Sand	Medium Fine Sand	Coarse and Coarse Fine Sand	LL	PI	LS		
TP1	0-280	66	11	10	13	32	8	4.5	0.70	A-4
	280-800	43	11	16	30	21	7	3.5	1.27	A-2-4
	800-1000	50	10	14	26	31	11	5.5	1.06	A-6
TP2	0-800	35	12	17	36	CBD	SP	1.2	0.83	A-2-4
	800-1000	37	16	20	27	28	7	3.5	1.06	A-2-4
TP3	0-200	28	19	23	30	CBD	SP	1.2	0.89	A-2-4
	200-1000	38	15	20	26	28	5	2.5	1.04	A-2-4
TP4	0-600	26	12	17	46	CBD	SP	0.9	1.58	A-2-4
	600-1000	29	9	12	50	CBD	SP	0.6	0.97	A-2-4
TP5	0-400	23	19	13	35	CBD	SP	1.2	1.15	A-2-4
	400-900	31	18	17	39	CBD	SP	1.4	2.23	A-1-a
	900-1000	37	16	17	30	27	7	3.5	1.85	A-2-4
TP6	0-500	18	21	24	38	CBD	NP	0.0	1.41	A-2-4
	500-1000	18	22	25	35	CBD	NP	0.0	1.18	A-2-4
TP7	0-400	13	18	24	45	CBD	NP	0.0	1.57	A-2-4
	400-1000	20	22	23	35	CBD	NP	0.0	1.25	A-2-4
TP8	0-400	22	17	21	40	CBD	SP	0.5	1.03	A-2-4
	400-1000	25	19	20	35	CBD	NP	0.0	1.31	A-2-4
TP1 RES	0.0-400	21	14	20	44	CBD	SP	0.6	0.96	A-2-4
	400-1600	24	15	21	40	CBD	SP	0.5	1.03	A-2-4
TP2 RES	0-300	22	13	23	42	CBD	NP	0.0	0.95	A-2-4
	300-1600	24	14	23	39	CBD	SP	0.5	0.94	A-2-4
TP3 RES	0-300	19	13	20	47	CBD	NP	0.0	1.02	A-2-4
	300-1600	20	15	21	43	CBD	NP	0.0	1.02	A-2-4
TP4 RES	0-400	23	17	22	39	CBD	NP	0.0	0.95	A-2-4
	400-1600	23	16	21	40	CBD	NP	0.0	0.93	A-2-4

LL – Liquid Limit
PI – Plasticity Index
LS – Linear Shrinkage

The results above indicate that the material occurring on site comprises a mixture of Clayey and silty sands sandstone/shale gravel and Sandstone pebbles. According to the AASHTO material classification these soils are GOOD to POOR subgrade material with medium potential for expansion in terms of the van der Merwe (1973) method. The plasticity index ranges between 5 and 11%.

Compaction test results

The compaction properties of the materials occurring on site were determined through laboratory testing and the results are summarised below.

Table 4: Summary of compaction test results

Pit No.	Depth (m)	Modified AASHTO		CBR Values (%) Compaction MDD (%)				Swell (%)	TRH 14 Classification
		MDD (kgm3)	OMC %	90	93	95	100		
TP1	280-800	2102	6.2	13	19	23	40	0.32	G7
TP2	0-800	1966	8.3	7	10	13	23	1.17	G8
	800-1000	1971	8.3	6	9	12	25	0.66	G9
TP3	200-1000	2062	8.9	11	20	30	80	0.06	G7
TP4	0-600	1985	6.6	17	26	35	69	0.05	G6
	600-1000	2012	9.4	7	12	16	37	0.24	G8
TP5	400-900	2058	8.9	7	10	12	22	0.23	G8
TP6	500-1000	1935	7.6	9	14	20	42	0.24	G8
TP8	400-1000	2045	5.5	8	11	13	22	0.35	G8
TP1 RES	0-400	2098	7.0	13	19	24	44	0.45	G7
	400-1000	2193	6.6	17	26	35	76	0.35	G7
TP2 RES	300-1600	2184	7.1	12	20	28	66	0.35	G7
TP3 RES	0-300	2051	6.7	9	14	19	42	0.26	G8

MDD – Maximum Dry Density
OMC – Optimum Moisture Content
CBR – California Bearing Ratio

The table above indicates that the in-situ soils have fair compaction properties. The Maximum Dry Density (MDD) ranges between 1935kg/m3 to 2193kg/m3 and an Optimum moisture Content (OMC) range of 6% to 10%. Low swell percentages at 95% modified AASHTO compaction occur. According to TRH 14 Classification, these are lower-quality materials, typically naturally occurring gravels and soils, used in the lower layers of the subgrade. Material ranges between G7 and G9.

7 SOIL / ROCK PROFILE

The ground profile across the site comprises of Silty sands and Silty Clayey Sands. Silty sands together dominate the subsoil profile across the site. From the surface occurs Slightly moist, light to dark brown, loose to very soft, residual/intact Silty Sands with fine roots, weathered sandstones and shale are visible on the profiles.

8 GEOTECHNICAL CONSIDERATIONS

8.1 Excavatability

Excavation conditions across the site should classify as “Intermediate excavation” according to SABS 1200 DA-1998, as the material was easily excavated by mechanical means.

8.2 Stability of excavations

Sidewall collapses occurred during the test pit excavations as such excavations are anticipated to be unstable. However, this appraisal is based on shallow test pits that were open for very short periods of time. Stability of excavations will have to be assessed during construction.

8.3 Compressible / collapsible soils

Soil with a collapsing fabric may be defined as soil that can withstand relatively large, imposed stresses with small settlements at a low in-situ moisture content but will exhibit a decrease in volume and increase in associated settlement with no increase in the applied stress if wetting up occurs, as is aptly described by (Schwartz;1985). Several geotechnical tests are available to determine the collapse potential of a soil material either as a parametric or numerical value.

The tests all depend on the availability of an undisturbed sample cut from the soil profile and are relatively expensive. With the transported soils on site being of loose and very loose consistency, it was not possible to extract an undisturbed sample. However, Errerra (1977) researched the properties of the residual and transported soils resulting from siltstone and sandstone tend to be

predominantly sandy and defined a grading envelope for collapsing sands. According to his research, it has been found that should the grading curve of a soil material fit into this envelope, the soil can be regarded as being of collapsing nature.

The transported materials on site with a consistency that is loose to medium dense which is prone to collapse according to research from Errrera. It is expected that the transported soil material will be collapsible when the moisture conditions change from dry to moist due to rainwater infiltration.

8.4 Expansive soils

A PI > 20 indicates high expansiveness. The materials tested on site shows that the Plasticity index is less than 20 which indicates that the potential for expansion is moderate or lower.

8.5 Groundwater conditions

Groundwater Seepages and Side wall Collapses were encountered on TP3 and TP4 together with all four reservoir test pits during this investigation.

8.6 Construction material

8.6.1 Selected granular material.

Selected Granular Material is used as bedding material to support the pipe, while the “Selected Back Fill Material” is used as blanket material over the crown of the pipe, especially if laying pipes. Back fill

material is generally placed above the blanket materials, up to ground level. Some of the in-situ silty sandy materials (transported layer) along the site are considered suitable to be used as Selected Granular Material" or "Selected Back Fill Material". Should there be inadequate volumes of the transported layer, the materials meeting the SANS1200LB requirements would thus need to be imported to the site.

8.6.2 Selected fill material

Selected fill material shall be material that has a PI not exceeding 6 and that is free from vegetation and from lumps and stones of diameter exceeding 30 mm.

It is therefore recommended that consideration be given to the use of a soil raft as founding solution for structures constructed with at least G7 material.

8.6.3 Founding conditions for structures and recommendations

Reservoir: The site is dominated by Moist, Dark Brown, Soft, Residual/Intact, Silty Sands with Fine Roots 0.00m to 0.4m. The soils range from soft to very soft. At 0.3m up to 1.6m occurs Moist, Light Brown, Very Soft, Residual/Intact, Silty Clayey Sands.

Lower CBR soils may necessitate thicker or stabilized layers to distribute loads effectively. Conversely, higher CBR soils can support thinner structures, optimizing material use and cost.

It is therefore recommended that consideration be given to the use of a soil raft as founding solution for structures constructed with at least G7 material.

9 CONCLUSIONS

This report presents the results of the investigation conducted for the CONSTRUCTION OF CAROLINA BULK WATER SUPPLY TO SILOBELA, EXTENSION 5, Chief Albert Luthuli Local Municipality, Gert Sibande District Municipality, Mpumalanga. The site investigation was conducted on the 27th of March 2025.

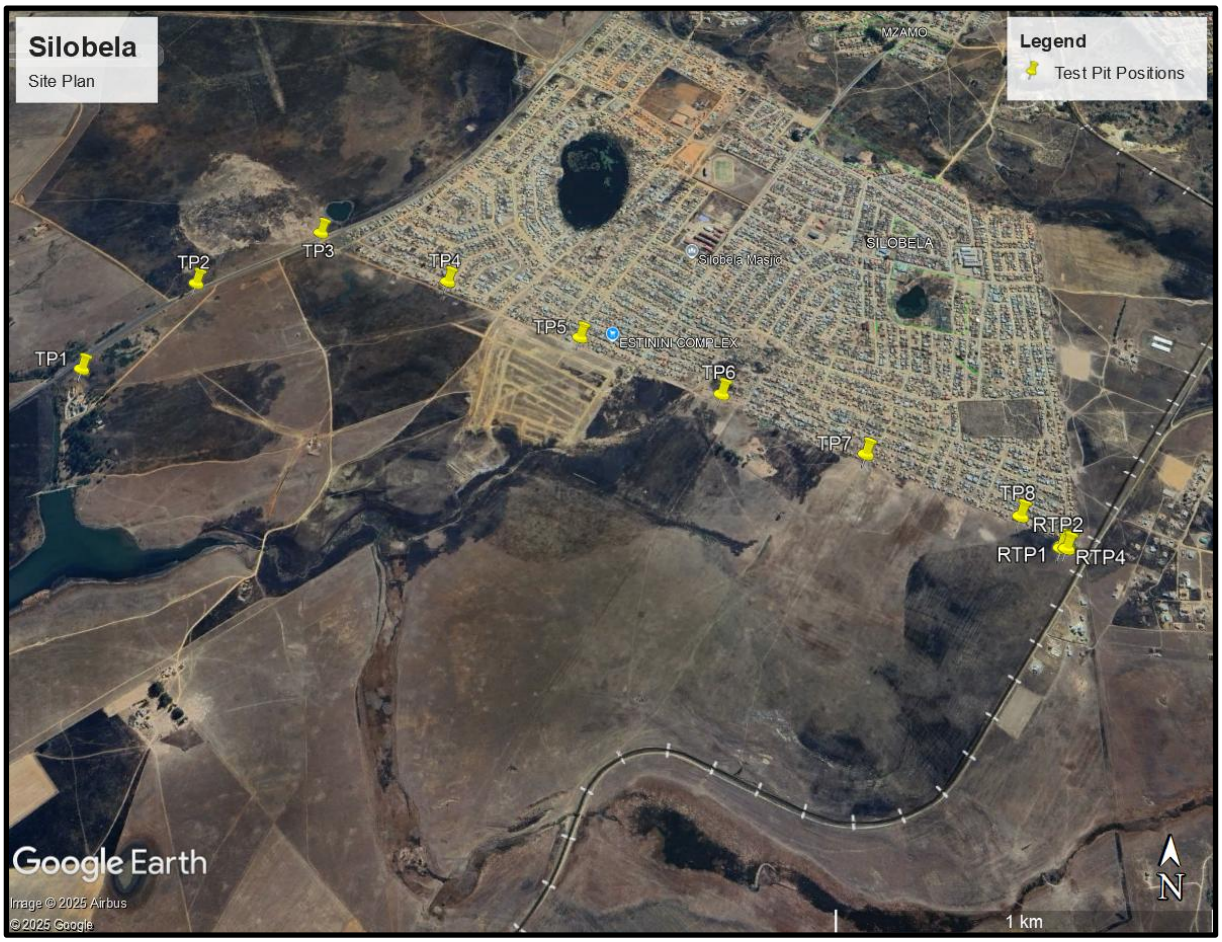
The site is suitable for the proposed development; however, all the geotechnical considerations must be adhered to.

It should however be noted that the information presented on this report is based on point information obtained from the test pits and that variable conditions may occur at intermediate positions.

10 REFERENCES

1. Geotechdata. URL: http://www.geotechdata.info/parameter/bearing-capacity.html/.
2. K. J. Wilkinson, F. Coetsee (1988). Department of Mineral and Energy Affairs, Geological Survey. – Pretoria (1:250 000 geological series; 2630 Mbabane).
3. SABS 1200 DA-1988: Standardized Specification for Civil Engineering Construction. DA: Earthworks (Small works).
4. http://www.saexplorer.co.za/south-africa/climate/Carolina, Silobela climate.asp
5. South African National Standard. Profiling, Percussion Borehole and Core Logging in Southern Africa. SANS 633:2012.

11 ANNEXURE A: SITE PLAN



12 ANNEXURE B: SOIL PROFILE LOGS

BAV CONSULTING
GEOTECH & GEOHYDROLOGY CONSULTING SERVICES

TESTPIT LOG 01

PROJECT NUMBER CAROLINA BULK WATER S	**DRILLING DATE** 27/03/2025	**COORDINATES** -26.093592S 30.089516E
CLIENT KUFANIKIWA CONSULTING	**TOTAL DEPTH** 1.0m	

COMMENTS

LOGGED BY M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0.05		Moist, Dark Reddish, Soft, Residual/Intact, Silty Sands.
0.1		SAMPLE: 1IND
0.15		NB: Material not enough for large bags.
0.2		
0.25		
0.3		Moist, Light Brown, Soft, Residual/Intact, Silty Sands with Shale and Boulders -300mm
0.35		SAMPLE: 2L
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		Moist, Light Brown Yellow, Soft, Residual/Intact, Silty Clayey Sands.
0.85		SAMPLE: 1IND
0.9		Material not eneough for Large Bags
0.95		
1		Termination Depth at 1.0 m

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TESTPIT LOG 02

PROJECT NUMBER CAROLINA BULK WATER S	**DRILLING DATE** 27/03/2025	**COORDINATES** -26.090532S 30.092785E
CLIENT KUFANIKIWA CONSULTING	**TOTAL DEPTH** 1.0m	

COMMENTS

LOGGED BY M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0		Moist, Dark Reddish, Soft, Residual/Intact, Silty Sands with fine roots.
0.05		SAMPLE: 2L
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		Moist, Light Reddish, Soft, Residual/Intact, Silty Clayey Sands
0.85		SAMPLE: 1IND
0.9		
0.95		
1		Termination Depth at: 1.0 m

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TESTPIT LOG 03

PROJECT NUMBER CAROLINA BULK WATER S **DRILLING DATE** 27/03/2025 **COORDINATES** -26.088541S 30.096778E
CLIENT KUFANIKIWA CONSULTING **TOTAL DEPTH** 1.0m

COMMENTS

LOGGED BY M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0		Moist, Dark Brown, Soft, Residual/Intact, Silty Sands with fine roots.
0.05		SAMPLE: 2L
0.1		
0.15		
0.2		Moist, Light Reddish, Very Soft, Residual/Intact, Silty Clayey Sands
0.25		SAMPLE: 2L
0.3		Sidewall Collapse from 400mm to 1000mm
0.35		
0.4		
0.45		
0.5		
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		Termination Depth at:1.0 m

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TESTPIT LOG 04

PROJECT NUMBER CAROLINA BULK WATER S	**DRILLING DATE** 27/03/2025	**COORDINATES** -26.090387S 30.101358E
CLIENT KUFANIKIWA CONSULTING	**TOTAL DEPTH** 1.0m	

COMMENTS

LOGGED BY M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0 – 0.6		Slightly Moist, Light Brown, Loose, Residual/Intact Silty Sands with Weathered Sandstone. SAMPLE: 2L
0.6 – 1		Slightly Moist, Whitish Reddish, Loose, Residual/Intact, Weathered Sandstone. SAMPLE: 2L
1		Termination Depth at:1.0 m

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TESTPIT LOG 05

ROJECT NUMBER CAROLINA BULK WATER S DRILLING DATE 27/03/2025 COORDINATES -26.090387S 30.101358E
LIENT KUFANIKIWA CONSULTING TOTAL DEPTH 1.0m

OMMENTS

LOGGED BY M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0.05		Moist, Dark Brown, Loose, Import, Silty Sands with Pieces of Plastic and Paper near Dump Site.
0.1		
0.15		SAMPLE: 1IND
0.2		
0.25		
0.3		
0.35		
0.4		Moist, Light Brown, Soft, Residual/Intact, Silty Sands
0.45		
0.5		SAMPLE: 2L
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		Moist, Light Brown Orange, Loose, Residual/Intact, Silty Sands with Sandstone Pebbles.
0.95		SAMPLE: 1IND
1		Ground Water Seepage at 800mm
		Termination Depth at 1.0 m

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TESTPIT LOG 06

PROJECT NUMBER CAROLINA BULK WATER S **DRILLING DATE** 27/03/2025 **COORDINATES** -26.094253S 30.110584E
CLIENT KUFANIKIWA CONSULTING **TOTAL DEPTH** 1.0m

COMMENTS

LOGGED BY M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0.05		Moist, Light Brown, Loose, Import, Silty Sands. SAMPLE: 1IND
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		
0.45		
0.5		Moist, Dark Brown, Loose, Residual/Intact, Silty Sands SAMPLE: 2L
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		Termination Depth at:1.0 m

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TESTPIT LOG 07

PROJECT NUMBER CAROLINA BULK WATER S	DRILLING DATE 27/03/2025	COORDINATES -26.096256S 30.115081E
CLIENT KUFANIKIWA CONSULTING	TOTAL DEPTH 1.0m	

COMMENTS

LOGGED BY M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0		Moist, Light Brown, Loose, Residual/Intact, Silty Sands.
0.05		SAMPLE: 1IND
0.1		
0.15		
0.2		
0.25		
0.3		
0.35		
0.4		Moist, Dark Brown, Loose, Residual/Intact, Silty Sands
0.45		SAMPLE: 1IND
0.5		Same material as TP6
0.55		
0.6		
0.65		
0.7		
0.75		
0.8		
0.85		
0.9		
0.95		
1		Termination Depth at:1.0 m

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TESTPIT LOG 08

PROJECT NUMBER CAROLINA BULK WATER S	**DRILLING DATE** 27/03/2025	**COORDINATES** -26.098202S 30.119647E
CLIENT KUFANIKIWA CONSULTING	**TOTAL DEPTH** 1.0m	

COMMENTS

LOGGED BY M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0 – 0.4		Moist, Dark Brown, Soft, Residual/Intact, Silty Sands with Fine Roots. SAMPLE: 1IND
0.4 – 1		Moist, Light Brown, Very Soft, Residual/Intact, Silty Sands SAMPLE: 2L
1		Termination Depth at: 1.0 m

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TESTPIT LOG RESERVOIR 01

PROJECT NUMBER CAROLINA BULK WATER S **DRILLING DATE** 27/03/2025 **COORDINATES** -26.099095S 30.112077E
CLIENT KUFANIKIWA CONSULTING **TOTAL DEPTH** 1.6m

COMMENTS Sidewall Collapse and groundwater Seepage 110mm **LOGGED BY** M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0.1		Moist, Dark Brown, Soft, Residual/Intact, Silty Sands with Fine Roots
0.2		SAMPLE: 2L
0.3		
0.4		Moist, Light Brown, Very Soft, Residual/Intact, Silty Clayey Sands.
0.5		SAMPLE: 2L
0.6		At 110mm there is groundwater seepage and side wall collapses.
0.7		
0.8		
0.9		
1		
1.1		
1.2		
1.3		
1.4		
1.5		
1.6		
1.7		
1.8		
1.9		
2		Termination Depth at:1.6 m

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TESTPIT LOG RESERVOIR 02

PROJECT NUMBER CAROLINA BULK WATER S **DRILLING DATE** 27/03/2025 **COORDINATES** -26.099169S 30.120728E
CLIENT KUFANIKIWA CONSULTING **TOTAL DEPTH** 1.6m

COMMENTS Sidewall Collapse and groundwater Seepage 900mm **LOGGED BY** M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0.1 – 0.3		Moist, Dark Brown, Soft, Residual/Intact, Silty Sands with Fine Roots SAMPLE: 1IND NB: Same as Reservoir TP1
0.4 – 1.6		Moist, Light Brown, Very Soft, Residual/Intact, Silty Clayey Sands. SAMPLE: 2L At 900mm there is groundwater seepage and side wall collapses.
1.7 – 2		Termination Depth at:1.6 m

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TESTPIT LOG RESERVOIR 03

PROJECT NUMBER CAROLINA BULK WATER S **DRILLING DATE** 27/03/2025 **COORDINATES** -26.099107S 30.120941E
CLIENT KUFANIKIWA CONSULTING **TOTAL DEPTH** 1.6m

COMMENTS Sidewall Collapse and groundwater Seepage 700mm **LOGGED BY** M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0.1 – 0.3		Moist, Dark Brown, Soft, Residual/Intact, Silty Sands with Fine Roots SAMPLE: 2L
0.3 – 1.6		Moist, Light Brown, Soft, Residual/Intact, Silty Clayey Sands. SAMPLE: 1IND At 700mm there is groundwater seepage and side wall collapses.
1.6 – 2		Termination Depth at:1.6 m

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TESTPIT LOG RESERVOIR 04

PROJECT NUMBER CAROLINA BULK WATER S **DRILLING DATE** 27/03/2025 **COORDINATES** -26.099177S 30.120899E
CLIENT KUFANIKIWA CONSULTING **TOTAL DEPTH** 1.6m

COMMENTS Sidewall Collapse and groundwater Seepage 800mm **LOGGED BY** M Hadebe
CHECKED BY T Ndaba

Depth (m)	Graphic Log	Material Description
0.1		Moist, Dark Brown, Soft, Residual/Intact, Silty Sands with Fine Roots
0.2		SAMPLE: 1IND
0.3		Same material as TP1, TP2 and TP3
0.4		Moist, Light Brown, Very Soft, Residual/Intact, Silty Clayey Sands.
0.5		SAMPLE: 1IND
0.6		At 800mm there is groundwater seepage and side wall collapses.
0.7		
0.8		
0.9		
1		
1.1		
1.2		
1.3		
1.4		
1.5		
1.6		
1.7		
1.8		
1.9		
2		Termination Depth at:1.6 m

13 ANNEXURE C: DCP TESTING RESULTS

DYNAMIC CONE PENETROMETER (DCP)

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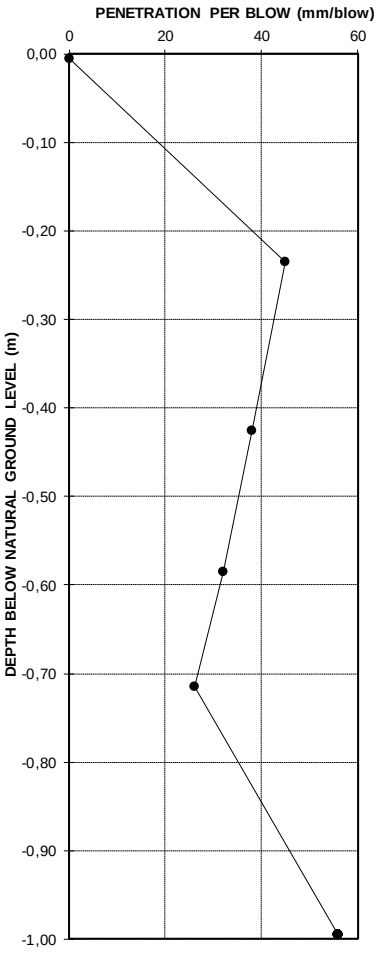
Client:	Kufanikiwa	Testpit No:	DCP1	Lane:	0
Project Name:	Silobela Pipeline	Section no:	0	GPS (X):	30,089516
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,093592
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	5		

Number of Blows	Penetration readings (fieldwork - mm)			Penetration Rate (mm/blow)	In situ CBR
	From		to		
0	0	-	5	0,0	
10	10	-	235	45,0	3
15	235	-	425	38,0	4
20	425	-	585	32,0	5
25	585	-	715	26,0	6
30	715	-	995	56,0	2

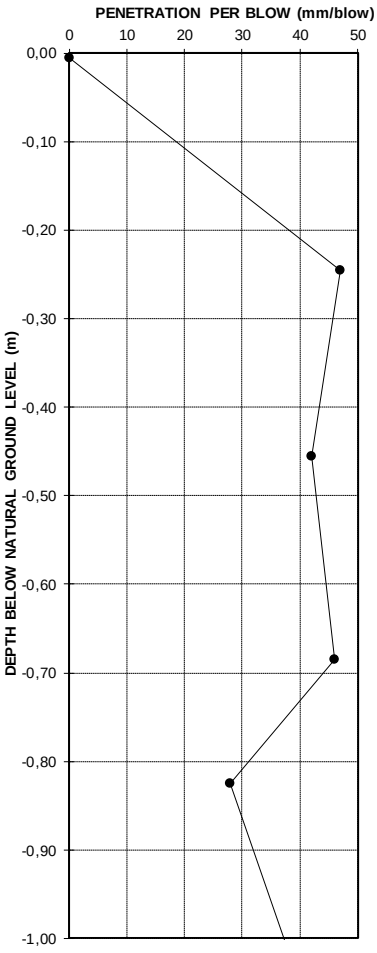


DYNAMIC CONE PENETROMETER (DCP)

BAV CONSULTING

Client:	Kufanikiwa	Testpit No:	DCP2	Lane:	0
Project Name:	Silobela Pipeline	Section no:	0	GPS (X):	30,092785
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,090532
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	5		

Number of Blows	Penetration readings (fieldwork - mm) From		to	Penetration Rate (mm/blow)	In situ CBR
0	0	-	5	0,0	
10	10	-	245	47,0	3
15	245	-	455	42,0	3
20	455	-	685	46,0	3
25	685	-	825	28,0	6
30	825	-	1015	38,0	4



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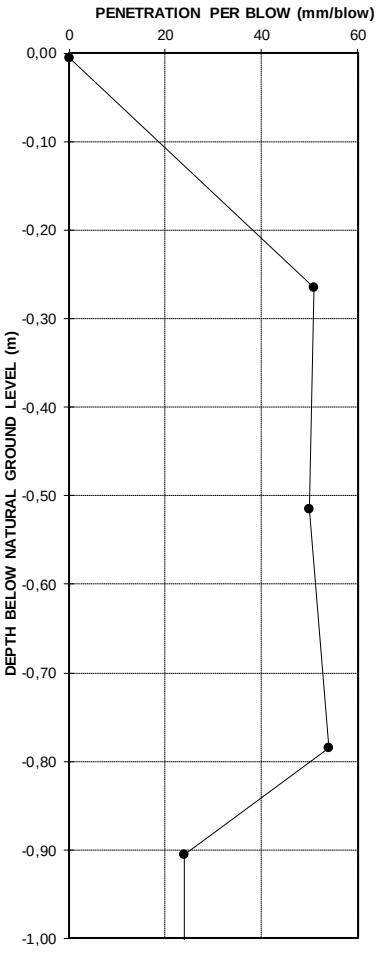
DYNAMIC CONE PENETROMETER (DCP)

BAV CONSULTING

Client:	Kufanikiwa	Testpit No:	DCP3	Lane:	0
Project Name:	Silobela Pipeline	Section no:	0	GPS (X):	30,096778
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,088541
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	5		

Number of Blows	Penetration readings (fieldwork - mm) From		to	Penetration Rate (mm/blow)	In situ CBR
0	0	-	5	0,0	
10	10	-	265	51,0	2
15	265	-	515	50,0	2
20	515	-	785	54,0	2
25	785	-	905	24,0	7
30	905	-	1025	24,0	7



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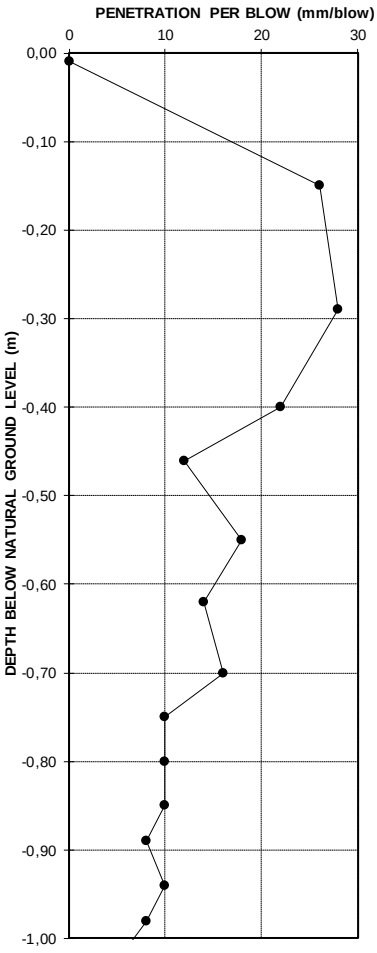
DYNAMIC CONE PENETROMETER (DCP)

BAV CONSULTING

Client:	Kufanikiwa	Testpit No:	DCP4	Lane:	0
Project Name:	Silobela Pipeline	Section no:	0	GPS (X):	30,101358
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,090387
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	10		

Number of Blows	Penetration readings (fieldwork - mm) From		to	Penetration Rate (mm/blow)	In situ CBR
0	0	-	10	0,0	
10	20	-	150	26,0	6
15	150	-	290	28,0	6
20	290	-	400	22,0	8
25	400	-	460	12,0	18
30	460	-	550	18,0	11
35	550	-	620	14,0	15
40	620	-	700	16,0	13
45	700	-	750	10,0	22
50	750	-	800	10,0	22
55	800	-	850	10,0	22
60	850	-	890	8,0	30
65	890	-	940	10,0	22
70	940	-	980	8,0	30
75	980	-	1010	6,0	45



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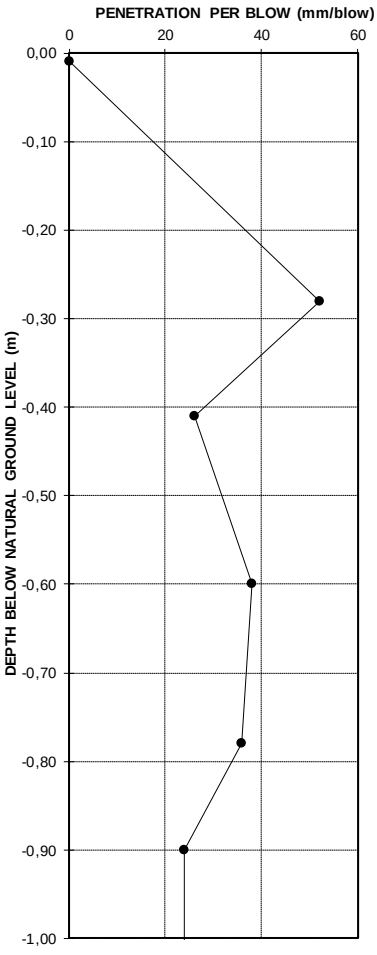
DYNAMIC CONE PENETROMETER (DCP)

BAV CONSULTING

Client:	Kufanikiwa	Testpit No:	DCP5	Lane:	0
Project Name:	Silobela Pipeline	Section no:	0	GPS (X):	30,105923
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,092355
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	10		

Number of Blows	Penetration readings (fieldwork - mm) From		to	Penetration Rate (mm/blow)	In situ CBR
0	0	-	10	0,0	
10	20	-	280	52,0	2
15	280	-	410	26,0	6
20	410	-	600	38,0	4
25	600	-	780	36,0	4
30	780	-	900	24,0	7
35	900	-	1020	24,0	7



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DYNAMIC CONE PENETROMETER (DCP)

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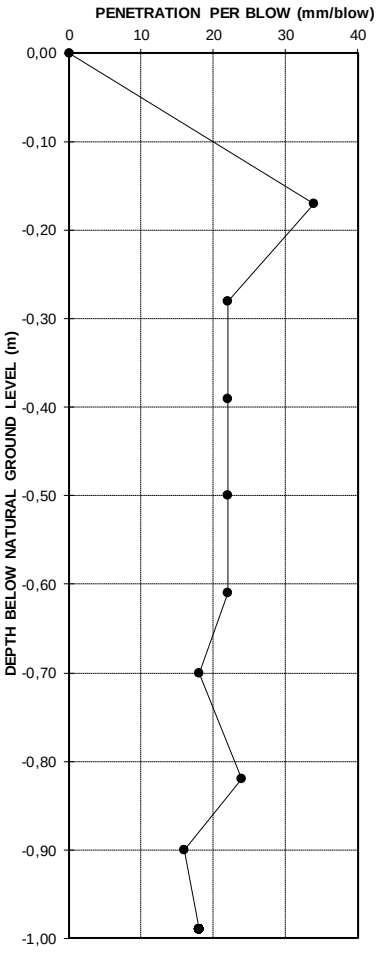
Client:	Kufanikiwa	Testpit No:	DCP6	Lane:	0
Project Name:	Silobela Pipeline	Section no:	0	GPS (X):	30,110584
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,094253
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	0		

Number of Blows	Penetration readings (fieldwork - mm) From		to	Penetration Rate (mm/blow)	In situ CBR
0	0	-	0	0,0	
5	0	-	170	34,0	4
10	170	-	280	22,0	8
15	280	-	390	22,0	8
20	390	-	500	22,0	8
25	500	-	610	22,0	8
30	610	-	700	18,0	11
35	700	-	820	24,0	7
40	820	-	900	16,0	13
45	900	-	990	18,0	11



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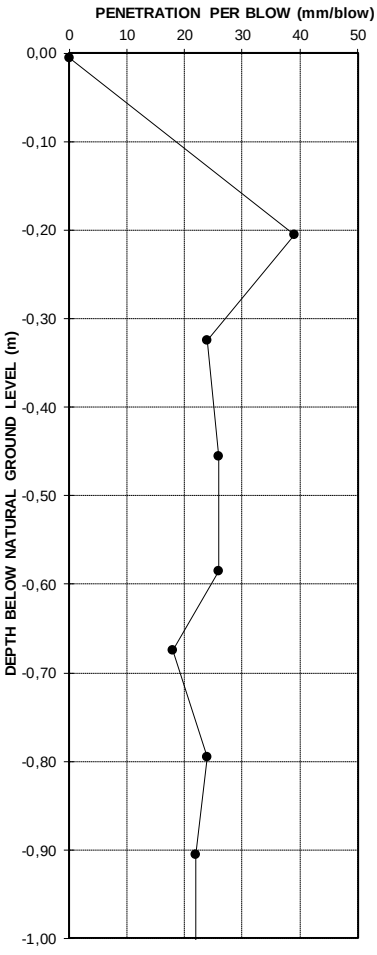
DYNAMIC CONE PENETROMETER (DCP)

BAV CONSULTING

Client:	Kufanikiwa	Testpit No:	DCP7	Lane:	0
Project Name:	Silobela Pipeline	Section no:	0	GPS (X):	30,115081
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,096256
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	5		

Number of Blows	Penetration readings (fieldwork - mm) From		to	Penetration Rate (mm/blow)	In situ CBR
0	0	-	5	0,0	
10	10	-	205	39,0	3
15	205	-	325	24,0	7
20	325	-	455	26,0	6
25	455	-	585	26,0	6
30	585	-	675	18,0	11
35	675	-	795	24,0	7
40	795	-	905	22,0	8
45	905	-	1015	22,0	8



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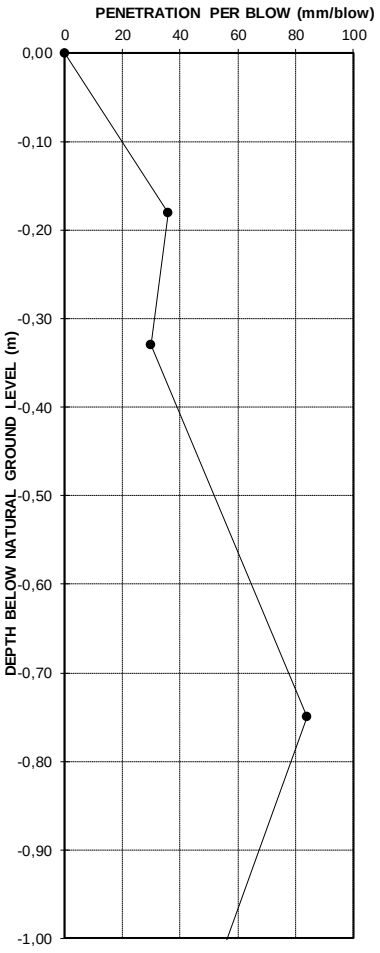
DYNAMIC CONE PENETROMETER (DCP)

BAV CONSULTING

Client:	Kufanikiwa	Testpit No:	DCP8	Lane:	0
Project Name:	Silobela Pipeline	Section no:	0	GPS (X):	30,119647
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,098202
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	0		

Number of Blows	Penetration readings (fieldwork - mm) From		to	Penetration Rate (mm/blow)	In situ CBR
0	0	-	0	0,0	
5	0	-	180	36,0	4
10	180	-	330	30,0	5
15	330	-	750	84,0	1
20	750	-	1020	54,0	2

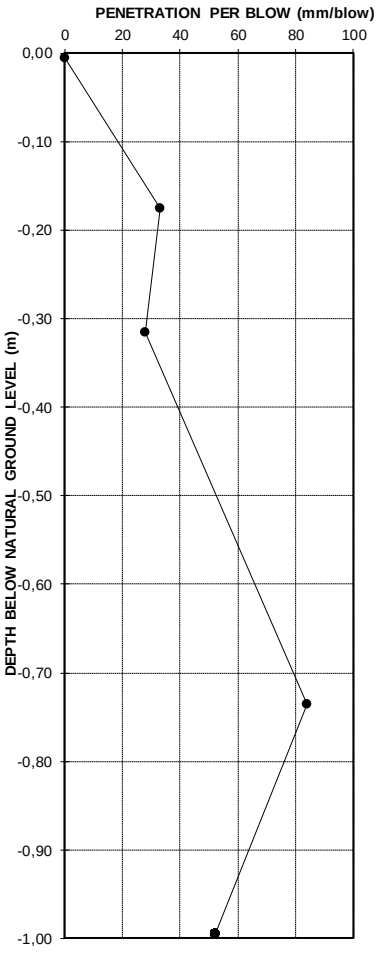


DYNAMIC CONE PENETROMETER (DCP)

BAV CONSULTING

Client:	Kufanikiwa	Testpit No:	DCP9 Res01	Lane:	0
Project Name:	Reservoir 01	Section no:	0	GPS (X):	30,120779
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,099095
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	5		

Number of Blows	Penetration readings (fieldwork - mm) From		to	Penetration Rate (mm/blow)	In situ CBR
0	0	-	5	0,0	
10	10	-	175	33,0	4
15	175	-	315	28,0	6
20	315	-	735	84,0	1
25	735	-	995	52,0	2



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DYNAMIC CONE PENETROMETER (DCP)

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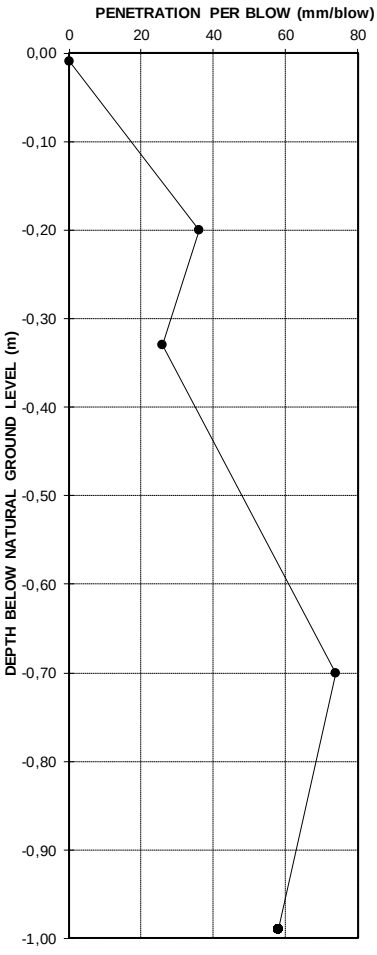
Client:	Kufanikiwa	Testpit No:	DCP10 Res02	Lane:	0
Project Name:	Reservoir 02	Section no:	0	GPS (X):	30,120728
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,099169
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	10		

Number of Blows	Penetration readings (fieldwork - mm) From		to	Penetration Rate (mm/blow)	In situ CBR
0	0	-	10	0,0	
10	20	-	200	36,0	4
15	200	-	330	26,0	6
20	330	-	700	74,0	FALSE
25	700	-	990	58,0	2



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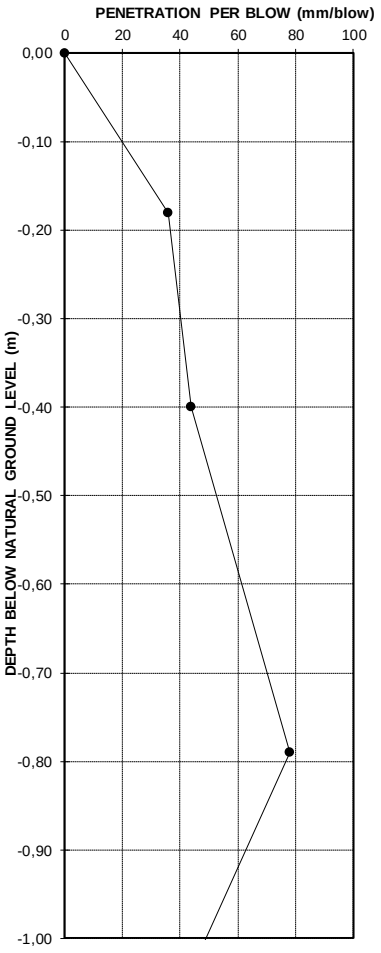
GEOTECH & GEOHYDROLOGY CONSULTING SERVICES

DYNAMIC CONE PENETROMETER (DCP)

BAV CONSULTING

Client:	Kufanikiwa	Testpit No:	DCP11 Res03	Lane:	0
Project Name:	Reservoir 03	Section no:	0	GPS (X):	30,120941
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,099107
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	0		

Number of Blows	Penetration readings (fieldwork - mm) From		to	Penetration Rate (mm/blow)	In situ CBR
0	0	-	0	0,0	
5	0	-	180	36,0	4
10	180	-	400	44,0	3
15	400	-	790	78,0	FALSE
20	790	-	1020	46,0	3



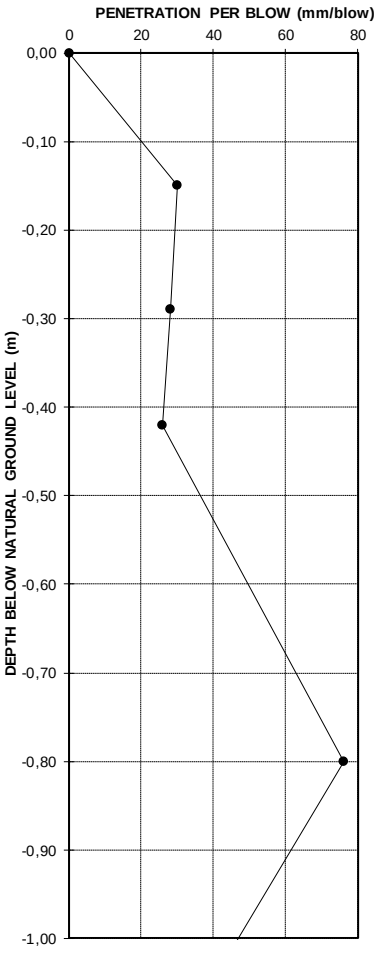
BAV CONSULTING
GEOTECH & GEOHYDROLOGY CONSULTING SERVICES

DYNAMIC CONE PENETROMETER (DCP)

BAV CONSULTING

Client:	Kufanikiwa	Testpit No:	DCP12 Res04	Lane:	0
Project Name:	Reservoir 04	Section no:	0	GPS (X):	30,120899
Project Number:	0	Chainage:	Carolina Bulk Water	GPS (Y):	26,099177
Job no:	Ground Assessment	Offset:	0,0	Date:	27-03-2025
Blow Interval:	5	Start depth:	0		

Number of Blows	Penetration readings (fieldwork - mm) From		to	Penetration Rate (mm/blow)	In situ CBR
0	0	-	0	0,0	
5	0	-	150	30,0	5
10	150	-	290	28,0	6
15	290	-	420	26,0	6
20	420	-	800	76,0	FALSE
25	800	-	1020	44,0	3



14 ANNEXURE D: LABORATORY TESTING RESULTS

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

CIVIL ENGINEERING MATERIALS TESTING LABORATORY

Reg. No. : 1965 / 009585 / 07
11 HALSTED ROAD - 24 DAVLEN PARK - MKONDENI - P.O.BOX 846 PIETERMARITZBURG - 3200
TELEPHONE : 033 - 386 9095 TELEFAX : 033 - 386 1878 email : shikar@soilco.co.za

sanas T 0823

Date : 2025-05-16

For the Attention of : Thanda Ndaba

Customer Name : BAV Consulting

Address : 103 Woodford Essex Gardens
1 Nelson Drive
3630

Project Information : Carolina Bulk Water Supply - Reservoir & Pipeline

Job Card Number : 259167

Sample Number / s : P3225 - P3249

Dear Sir / Madam,

Herewith, please find the report(s), pertaining to the above project. All tests conducted are in accordance with prescribed test method(s). Information herein consists of the following : -

Materials Report and Reference No.	Test Conducted	Prescribed Method	No. of Pages
Materials Report (Soilco SF 33)	Sieve Analysis	SANS 3001 GR 1	12
	Atterberg Limits	SANS 3001 GR 10 - GR 12	
	The Determination of Maximum Dry Density & Optimum Moisture Content	SANS 3001 GR 30	
	California Bearing Ratio	SANS 3001 GR 40	
Moisture / Density Relationship (Soilco SF 38)	The Determination of Maximum Dry Density & Optimum Moisture Content	SANS 3001 GR 30	13

We thank you for your valued support and look forward to assisting you in the near future.

Yours faithfully,

Page 1 of 26

For Soilco (Technical Signatory)
S. Jayraj

Any test results contained in this report and marked with * in the table above are " Not SANAS Accredited ", and are Not included in the Schedule of Accreditation for this Laboratory.

Any information contained in this test report pertain only to the areas of samples as received and tested at the Laboratory . Documents may only be reproduced or published in their full context. Any information in relation to the client and associated test results, gained by the laboratory prior, during or after the test process will be treated as confidential and will not be reproduced or disclosed to any person or organization, without the prior written consent from the client, unless required by law or covered by legally enforceable, signed confidentiality undertakings (i.e. SANAS Assessors or Internal Auditors). If the arrangement is not suitable to you, our client, please contact the Management of Soilco Materials Investigations (Pty) Ltd.

While every care is taken to ensure that all tests are carried out in accordance with recognised standards, neither Soilco Materials Investigations (Pty) Ltd nor its employees shall be liable in any way whatsoever for any error made in the execution or reporting of tests or any erroneous conclusions drawn therefrom or for any consequences thereof.

All interpretations, Interpolations, Opinions and / or Classifications contained in this report falls outside our scope of accreditation.

Unless otherwise requested or stated, all samples will be discarded after a period of 3 months.

Deviation from Test Method : - Moisture Contents Dried Overnight at 105°C to 110°C.

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TELEPHONE : 033 386 9095 TELEFAX : 033 386 1878 email : shikar@soilco.co.za

sanas T 0823

Customer	:	BAV Consulting	**Job Card No.**	:	259167
Project	:	Carolina Bulk Water Supply - Reservoir	**Date Received**	:	2025-04-16
			Date Tested	:	2025-04-16 to 2025-05-15
Condition of Sample	:	Moist	**Date Reported**	:	2025-05-16
Environmental Conditions	:		**Date Sampled**	:	2025-04-16
Sampling Process	:	Samples Delivered by Customer			

MATERIALS TEST REPORT

Laboratory Number		P3225	P3226			
Field Number		-	-			
Position in field / Location		TP 01 - Reservoir				
Depth (m)		0.0 - 0.4	0.4 - 1.6			
Sample Description		Dk. Br. Silty Sands	Lt. Br. Silty Clayey Sands			
Stabilising Agent		Natural	Natural			
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
26.0 mm						
20.0 mm			100			
14.0 mm			99			
5.0 mm		100	97			
2.0 mm		99	94			
0.425 mm		84	80			
0.075 mm		20.7	23.1			
Grading Modulus	SANS 3001 PR 5	0.96	1.03			
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	15	15			
Coarse - Fine Sand	(%)	29	25			
Medium - Fine Sand	(%)	20	21			
Fine - Fine Sand	(%)	14	15			
Silt and Clay	(%)	21	24			
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	CBD	CBD			
Plasticity Index	(%)	SP	SP			
Linear Shrinkage	(%)	0.6	0.5			
Materials Classification						
Classification Group Index	#	A-2-4	A-2-4			
COTO (Draft)	#	G7	G7			
COLTO Classification	#	G7	G7			
TRH 14 Classification (1985)	#	G7	G7			
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m^3)	2098	2193			
Optimum Moisture Content	(%)	7.0	6.6			
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction		44	76			
CBR @ 98 % Compaction		34	56			
CBR @ 95 % Compaction		24	35			
CBR @ 93 % Compaction		19	26			
CBR @ 90 % Compaction		13	17			
Swell @ 100 % Compaction		0.45	0.35			

Remarks : The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.

For Soilco - S. Jaga (Technical Signatory)
2015-05-12

Revision 1

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Soilco SF 33

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

CIVIL ENGINEERING MATERIALS TESTING LABORATORY

Reg. No. : 1965 / 009585 / 07
11 HALSTED ROAD - 24 DAVLEN PARK - MKONDENI - P.O.BOX 846 - PIETERMARITZBURG
TELEPHONE : 033 386 9095 TELEFAX : 033 386 1878 email : shikar@soilco.co.za

sanas T 0823

Customer : BAV Consulting
Project : Carolina Bulk Water Supply - Reservoir
Condition of Sample : Moist
Environmental Conditions :
Sampling Process : Samples Delivered by Customer

Job Card No. : 259167
Date Received : 2025-04-16
Date Tested : 2025-04-16 to 2025-05-15
Date Reported : 2025-05-16
Date Sampled : 2025-04-16

MATERIALS TEST REPORT

Laboratory Number		P3227	P3228			
Field Number		-	-			
Position in field / Location		TP 02 - Reservoir				
Depth (m)		0.0 - 0.3	0.3 - 1.6			
Sample Description		Dk.Br Silty Sands	Lt.Br Silty Clayey Sands.			
Stabilising Agent		Natural	Natural			
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
28.0 mm						
20.0 mm						
14.0 mm						
5.0 mm		100	100			
2.0 mm		99	97			
0.425 mm		83	85			
0.075 mm		22	23			
Grading Modulus	SANS 3001 PR 5	0.95	0.94			
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	16	13			
Coarse - Fine Sand	(%)	26	26			
Medium - Fine Sand	(%)	23	23			
Fine - Fine Sand	(%)	13	14			
Silt and Clay	(%)	22	24			
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	CBD	CBD			
Plasticity Index	(%)	NP	SP			
Linear Shrinkage	(%)	0.0	0.5			
Materials Classification						
Classification Group Index	#	A-2-4	A-2-4			
COTO (Draft)	#		G7			
COLTO Classification	#		G7			
TRH 14 Classification (1985)	#		G7			
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m^3)		2184			
Optimum Moisture Content	(%)		7.1			
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction			66			
CBR @ 98 % Compaction			47			
CBR @ 95 % Compaction			28			
CBR @ 93 % Compaction			20			
CBR @ 90 % Compaction			12			
Swell @ 100 % Compaction			0.35			

Remarks : The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.

For Soilco - S. Jayraj (Technical Signatory)
2015-05-12

Revision 1

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Soilco SF 33

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

CIVIL ENGINEERING MATERIALS TESTING LABORATORY

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TELEPHONE : 033 386 9095 TELEFAX : 033 386 1878 email : shikar@soilco.co.za

sanas T 0823

Customer	:	BAV Consulting	**Job Card No.**	:	259167
Project	:	Carolina Bulk Water Supply - Reservoir	**Date Received**	:	2025-04-16
			Date Tested	:	2025-04-16 to 2025-05-15
Condition of Sample	:	Moist	**Date Reported**	:	2025-05-16
Environmental Conditions	:		**Date Sampled**	:	2025-04-16
Sampling Process	:	Samples Delivered by Customer			

MATERIALS TEST REPORT

Laboratory Number		P3229	P3230			
Field Number		-	-			
Position in field / Location		TP 03 - Reservoir				
Depth (m)		0.0 - 0.3	0.3 - 1.6			
Sample Description		DK.Br Silty Sands	Lt.Br. Silty Clayey Sands			
Stabilising Agent		Natural	Natural			
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
28.0 mm						
20.0 mm						
14.0 mm						
5.0 mm			100			
2.0 mm		100	99			
0.425 mm		79	80			
0.075 mm		19.4	20			
Grading Modulus	SANS 3001 PR 5	1.02	1.02			
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	20	19			
Coarse - Fine Sand	(%)	27	24			
Medium - Fine Sand	(%)	20	21			
Fine - Fine Sand	(%)	13	15			
Silt and Clay	(%)	19	20			
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	CBD	CBD			
Plasticity Index	(%)	NP	NP			
Linear Shrinkage	(%)	0.0	0.0			
Materials Classification						
Classification Group Index	#	A-2-4	A-2-4			
COTO (Draft)	#	G8				
COLTO Classification	#	G8				
TRH 14 Classification (1985)	#	G8				
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m^3)	2051				
Optimum Moisture Content	(%)	6.7				
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction		42				
CBR @ 98 % Compaction		31				
CBR @ 95 % Compaction		19				
CBR @ 93 % Compaction		14				
CBR @ 90 % Compaction		9				
Swell @ 100 % Compaction		0.26				

Remarks : The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.

For Soilco - S. Ayyaj (Technical Signatory)
2025-05-22

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

CIVIL ENGINEERING MATERIALS TESTING LABORATORY

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TELEPHONE : 033 386 9095 TELEFAX : 033 386 1878 email : shikar@soilco.co.za

sanas T 0823

Customer	:	BAV Consulting	**Job Card No.**	:	259167
Project	:	Carolina Bulk Water Supply - Reservoir	**Date Received**	:	2025-04-16
			Date Tested	:	2025-04-16 to 2025-05-15
Condition of Sample	:	Moist	**Date Reported**	:	2025-05-16
Environmental Conditions	:		**Date Sampled**	:	2025-04-16
Sampling Process	:	Samples Delivered by Customer			

MATERIALS TEST REPORT

Laboratory Number		P3231	P3232			
Field Number		-	-			
Position in field / Location		TP 04 - Reservoir				
Depth (m)		0.0 - 0.4	0.4 - 1.6			
Sample Description		Dk.Br. Silty Sands	Lt.Br Silty Clayey Sands			
Stabilising Agent		Natural	Natural			
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
28.0 mm						
20.0 mm						
14.0 mm						
5.0 mm						
2.0 mm		100	100			
0.425 mm		82	84			
0.075 mm		23.1	23.2			
Grading Modulus	SANS 3001 PR 5	0.95	0.93			
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	18	16			
Coarse - Fine Sand	(%)	21	24			
Medium - Fine Sand	(%)	22	21			
Fine - Fine Sand	(%)	17	16			
Silt and Clay	(%)	23	23			
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	CBD	CBD			
Plasticity Index	(%)	NP	NP			
Linear Shrinkage	(%)	0.0	0.0			
Materials Classification						
Classification Group Index	#	A-2-4	A-2-4			
COTO (Draft)	#					
COLTO Classification	#					
TRH 14 Classification (1985)	#					
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m^3)					
Optimum Moisture Content	(%)					
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction						
CBR @ 98 % Compaction						
CBR @ 95 % Compaction						
CBR @ 93 % Compaction						
CBR @ 90 % Compaction						
Swell @ 100 % Compaction						

Remarks : **The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.**

For Soilco - S. Jaipal (Technical Signatory)
2015-05-12

Revision 1

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TELEPHONE : 033 386 9095 TELEFAX : 033 386 1878 email : shikar@soilco.co.za

sanas T 0823

Customer	:	BAV Consulting	**Job Card No.**	:	259167
Project	:	Carolina Bulk Water Supply - Pipeline	**Date Received**	:	2025-04-16
			Date Tested	:	2025-04-16 to 2025-05-15
Condition of Sample	:	Moist	**Date Reported**	:	2025-05-16
Environmental Conditions	:		**Date Sampled**	:	2025-04-16
Sampling Process	:	Samples Delivered by Customer			

MATERIALS TEST REPORT

Laboratory Number		P3233	P3234	P3235		
Field Number		-	-	-		
Position in field / Location		TP 01 - Pipeline				
Depth (m)		0 - 0.28	0.28 - 0.8	0.8 - 1.0		
Sample Description		Dk.R. Silty Sands	Lt.Br. Silty Sands with Shale	Lt.Br.Y. Silty Clayey Sands		
Stabilising Agent		Natural	Natural	Natural		
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
28.0 mm						
20.0 mm		100	100	100		
14.0 mm		98	99	98		
5.0 mm		92	87	89		
2.0 mm		88	76	82		
0.425 mm		84	64	71		
0.075 mm		58.1	32.7	41.1		
Grading Modulus	SANS 3001 PR 5	0.70	1.27	1.06		
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	5	16	14		
Coarse - Fine Sand	(%)	8	14	12		
Medium - Fine Sand	(%)	10	16	14		
Fine - Fine Sand	(%)	11	11	10		
Silt and Clay	(%)	66	43	50		
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	32	21	31		
Plasticity Index	(%)	8	7	11		
Linear Shrinkage	(%)	4.5	3.5	5.5		
Materials Classification						
Classification Group Index	#	A-4	A-2-4	A-6		
COTO (Draft)	#		G7			
COLTO Classification	#		G7			
TRH 14 Classification (1985)	#		G7			
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m^3)		2102			
Optimum Moisture Content	(%)		6.2			
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction			40			
CBR @ 98 % Compaction			32			
CBR @ 95 % Compaction			23			
CBR @ 93 % Compaction			19			
CBR @ 90 % Compaction			13			
Swell @ 100 % Compaction			0.32			

Remarks : The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.

For Soilco / S. Jayraj (Technical Signatory)
2025-05-16

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TELEPHONE : 033 386 9095 TELEFAX : 033 386 1878 email : shikar@soilco.co.za

sanas T 0823

Customer : BAV Consulting
Project : Carolina Bulk Water Supply - Pipeline
Condition of Sample : Moist
Environmental Conditions :
Sampling Process : Samples Delivered by Customer

Job Card No. : 259167
Date Received : 2025-04-16
Date Tested : 2025-04-16 to 2025-05-15
Date Reported : 2025-05-16
Date Sampled : 2025-04-16

MATERIALS TEST REPORT

Laboratory Number		P3236	P3236 A			
Field Number		-	-			
Position in field / Location		TP 02 - Pipeline				
Depth (m)		0 - 0.8	0.8 - 1.0			
Sample Description		DK.R. Silty Sands	LI.R Silty Clayey Sands			
Stabilising Agent		Natural	Natural			
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
28.0 mm						
20.0 mm						
14.0 mm			100			
5.0 mm		100	97			
2.0 mm		98	87			
0.425 mm		84	75			
0.075 mm		34.6	32.4			
Grading Modulus	SANS 3001 PR 5	0.83	1.06			
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	14	14			
Coarse - Fine Sand	(%)	22	13			
Medium - Fine Sand	(%)	17	20			
Fine - Fine Sand	(%)	12	16			
Silt and Clay	(%)	35	37			
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	CBD	28			
Plasticity Index	(%)	SP	7			
Linear Shrinkage	(%)	1.25	3.5			
Materials Classification						
Classification Group Index	#	A-2-4	A-2-4			
COTO (Draft)	#	G8	G9			
COLTO Classification	#	G8	G9			
TRH 14 Classification (1985)	#	G8	G9			
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m^3)	1966	1971			
Optimum Moisture Content	(%)	8.3	8.3			
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction		23	25			
CBR @ 98 % Compaction		18	19			
CBR @ 95 % Compaction		13	12			
CBR @ 93 % Compaction		10	9			
CBR @ 90 % Compaction		7	6			
Swell @ 100 % Compaction		1.17	0.66			

Remarks : The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.

For Soilco - S. Ujyna (Technical Signatory)
2015-02-12

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Soilco SF 33

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

CIVIL ENGINEERING MATERIALS TESTING LABORATORY

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TELEPHONE : 033 386 9095 TELEFAX : 033 386 1878 email : shikar@soilco.co.za

sanas T 0823

Customer : BAV Consulting
Project : Carolina Bulk Water Supply - Pipeline

Condition of Sample : Moist
Environmental Conditions :
Sampling Process : Samples Delivered by Customer

Job Card No. : 259167
Date Received : 2025-04-16
Date Tested : 2025-04-16 to 2025-05-15
Date Reported : 2025-05-16
Date Sampled : 2025-04-16

MATERIALS TEST REPORT

Laboratory Number		P3237	P3238			
Field Number		-	-			
Position in field / Location		TP 03 - Pipeline				
Depth (m)		0 - 0.2	0.2 - 1.0			
Sample Description		Dk.Br. Silty Sands	Lt.R Silty Clayey Sands			
Stabilising Agent		Natural	Natural			
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
28.0 mm						
20.0 mm						
14.0 mm			100			
5.0 mm		100	97			
2.0 mm		98	87			
0.425 mm		86	75			
0.075 mm		27.1	33.3			
Grading Modulus	SANS 3001 PR 5	0.89	1.04			
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	12	13			
Coarse - Fine Sand	(%)	18	13			
Medium - Fine Sand	(%)	23	20			
Fine - Fine Sand	(%)	19	15			
Silt and Clay	(%)	28	38			
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	CBD	28			
Plasticity Index	(%)	SP	5			
Linear Shrinkage	(%)	1.15	2.5			
Materials Classification						
Classification Group Index	#	A-2-4	A-2-4			
COTO (Draft)	#		G7			
COLTO Classification	#		G7			
TRH 14 Classification (1985)	#		G7			
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m^3)		2062			
Optimum Moisture Content	(%)		8.9			
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction			80			
CBR @ 98 % Compaction			54			
CBR @ 95 % Compaction			30			
CBR @ 93 % Compaction			20			
CBR @ 90 % Compaction			11			
Swell @ 100 % Compaction			0.06			

Remarks : The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.

For Soilco - S. Jayraj (Technical Signatory)
2015-05-12

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

CIVIL ENGINEERING MATERIALS TESTING LABORATORY

Reg. No. : 1965 / 009585 / 07
11 HALSTED ROAD - 24 DAVLEN PARK - MKONDENI - P.O.BOX 846 - PIETERMARITZBURG
TELEPHONE : 033 386 9095 TELEFAX : 033 386 1878 email : shikar@soilco.co.za

sanas T 0823

Customer : BAV Consulting
Project : Carolina Bulk Water Supply - Pipeline
Condition of Sample : Moist
Environmental Conditions :
Sampling Process : Samples Delivered by Customer

Job Card No. : 259167
Date Received : 2025-04-16
Date Tested : 2025-04-16 to 2025-05-15
Date Reported : 2025-05-16
Date Sampled : 2025-04-16

MATERIALS TEST REPORT

Laboratory Number		P3239	P3240			
Field Number		-	-			
Position in field / Location		TP 04 - Pipeline				
Depth (m)		0 - 0.6	0.6 - 1.0			
Sample Description		Lt.Br Silty Sands + Weathered Sandstone	White Reddish Weathered Sandstone			
Stabilising Agent		Natural	Natural			
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
28.0 mm						
20.0 mm		100				
14.0 mm		88				
5.0 mm		78	100			
2.0 mm		72	99			
0.425 mm		52	75			
0.075 mm		18.5	28.9			
Grading Modulus	SANS 3001 PR 5	1.58	0.97			
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	28	25			
Coarse - Fine Sand	(%)	18	25			
Medium - Fine Sand	(%)	17	12			
Fine - Fine Sand	(%)	12	9			
Silt and Clay	(%)	26	29			
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	CBD	CBD			
Plasticity Index	(%)	SP	SP			
Linear Shrinkage	(%)	0.95	0.6			
Materials Classification						
Classification Group Index	#	A-2-4	A-2-4			
COTO (Draft)	#	G6	G8			
COLTO Classification	#	G6	G8			
TRH 14 Classification (1985)	#	G6	G8			
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m^3)	1985	2012			
Optimum Moisture Content	(%)	6.6	9.4			
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction		69	37			
CBR @ 98 % Compaction		52	27			
CBR @ 95 % Compaction		35	16			
CBR @ 93 % Compaction		26	12			
CBR @ 90 % Compaction		17	7			
Swell @ 100 % Compaction		0.05	0.24			

Remarks : The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.

For Soilco : S.Naiyraj (Technical Signatory)
2025-05-22

Revision 1

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sanas T 0823

Customer : BAV Consulting
Project : Carolina Bulk Water Supply - Pipeline

Condition of Sample : Moist
Environmental Conditions :
Sampling Process : Samples Delivered by Customer

Job Card No. : 259167
Date Received : 2025-04-16
Date Tested : 2025-04-16 to 2025-05-15
Date Reported : 2025-05-16
Date Sampled : 2025-04-16

MATERIALS TEST REPORT

Laboratory Number		P3241	P3242	P3243		
Field Number		-	-	-		
Position in field / Location		TP 05 - Pipeline				
Depth (m)		0 - 0.4	0.4 - 0.9	0.9 - 1.0		
Sample Description		Dk.Br Silty Sands	Lt.Br. Silty Sands	Lt.Br.Or. Silty Sands + Sandstone Pebbles		
Stabilising Agent		Natural	Natural	Natural		
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
28.0 mm						
20.0 mm				100		
14.0 mm		100	100	88		
5.0 mm		95	44	59		
2.0 mm		89	37	52		
0.425 mm		75	29	44		
0.075 mm		20.6	11.4	19		
Grading Modulus	SANS 3001 PR 5	1.15	2.23	1.85		
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	16	23	15		
Coarse - Fine Sand	(%)	19	12	15		
Medium - Fine Sand	(%)	23	17	17		
Fine - Fine Sand	(%)	19	18	16		
Silt and Clay	(%)	23	31	37		
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	CBD	CBD	27		
Plasticity Index	(%)	SP	SP	7		
Linear Shrinkage	(%)	1.2	1.4	3.5		
Materials Classification						
Classification Group Index	#	A-2-4	A-1-a	A-2-4		
COTO (Draft)	#		G8			
COLTO Classification	#		G8			
TRH 14 Classification (1985)	#		G8			
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m^3)		2058			
Optimum Moisture Content	(%)		8.9			
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction			22			
CBR @ 98 % Compaction			17			
CBR @ 95 % Compaction			12			
CBR @ 93 % Compaction			10			
CBR @ 90 % Compaction			7			
Swell @ 100 % Compaction			0.23			

Remarks : The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.

For Soilco - S. Jantaj (Technical Signatory)

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

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sanas T 0823

Customer	:	BAV Consulting	**Job Card No.**	:	259167
Project	:	Carolina Bulk Water Supply - Pipeline	**Date Received**	:	2025-04-16
			Date Tested	:	2025-04-16 to 2025-05-15
Condition of Sample	:	Moist	**Date Reported**	:	2025-05-16
Environmental Conditions	:		**Date Sampled**	:	2025-04-16
Sampling Process	:	Samples Delivered by Customer			

MATERIALS TEST REPORT

Laboratory Number		P3244	P3245			
Field Number		-	-			
Position in field / Location		TP 06 - Pipeline				
Depth (m)		0 - 0.5	0.5 - 1.0			
Sample Description		Lt.Br.Silty Sands	Dk.Br. Silty Sands			
Stabilising Agent		Natural	Natural			
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
28.0 mm						
20.0 mm		100				
14.0 mm		97	100			
5.0 mm		86	95			
2.0 mm		80	89			
0.425 mm		65	77			
0.075 mm		14.1	16			
Grading Modulus	SANS 3001 PR 5	1.41	1.18			
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	19	14			
Coarse - Fine Sand	(%)	19	21			
Medium - Fine Sand	(%)	24	25			
Fine - Fine Sand	(%)	21	22			
Silt and Clay	(%)	18	18			
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	CBD	CBD			
Plasticity Index	(%)	NP	NP			
Linear Shrinkage	(%)	0.0	0.0			
Materials Classification						
Classification Group Index	#	A-2-4	A-2-4			
COTO (Draft)	#		G8			
COLTO Classification	#		G8			
TRH 14 Classification (1985)	#		G8			
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m³)		1935			
Optimum Moisture Content	(%)		7.6			
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction			42			
CBR @ 98 % Compaction			31			
CBR @ 95 % Compaction			20			
CBR @ 93 % Compaction			14			
CBR @ 90 % Compaction			9			
Swell @ 100 % Compaction			0.24			

Remarks : The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.

For Soilco - S. Jayraj (Technical Signatory)
2015-05-12

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

CIVIL ENGINEERING MATERIALS TESTING LABORATORY

Reg. No. : 1965 / 009585 / 07
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sanas T 0823

Customer : BAV Consulting
Project : Carolina Bulk Water Supply - Pipeline
Condition of Sample : Moist
Environmental Conditions :
Sampling Process : Samples Delivered by Customer

Job Card No. : 259167
Date Received : 2025-04-16
Date Tested : 2025-04-16 to 2025-05-15
Date Reported : 2025-05-16
Date Sampled : 2025-04-16

MATERIALS TEST REPORT

Laboratory Number		P3246	P3247			
Field Number		-	-			
Position in field / Location		TP 07 - Pipeline				
Depth (m)		0 - 0.4	0.4 - 1.0			
Sample Description		Lt.Br Silty Sands	Dk.Br. Silty Sands			
Stabilising Agent		Natural	Natural			
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
28.0 mm						
20.0 mm		100	100			
14.0 mm		99	99			
5.0 mm		89	92			
2.0 mm		75	86			
0.425 mm		57	72			
0.075 mm		10	16.8			
Grading Modulus	SANS 3001 PR 5	1.57	1.25			
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	23	16			
Coarse - Fine Sand	(%)	22	19			
Medium - Fine Sand	(%)	24	23			
Fine - Fine Sand	(%)	18	22			
Silt and Clay	(%)	13	20			
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	CBD	CBD			
Plasticity Index	(%)	NP	NP			
Linear Shrinkage	(%)	0.0	0.0			
Materials Classification						
Classification Group Index	#	A-2-4	A-2-4			
COTO (Draft)	#					
COLTO Classification	#					
TRH 14 Classification (1985)	#					
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m^3)					
Optimum Moisture Content	(%)					
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction						
CBR @ 98 % Compaction						
CBR @ 95 % Compaction						
CBR @ 93 % Compaction						
CBR @ 90 % Compaction						
Swell @ 100 % Compaction						

Remarks : The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.

For Soilco - B. Shyraj (Technical Signatory)
2025-05-15

Revision 1

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sanas T 0823

Customer	:	BAV Consulting	**Job Card No.**	:	259167
Project	:	Carolina Bulk Water Supply - Pipeline	**Date Received**	:	2025-04-16
			Date Tested	:	2025-04-16 to 2025-05-15
Condition of Sample	:	Moist	**Date Reported**	:	2025-05-16
Environmental Conditions	:		**Date Sampled**	:	2025-04-16
Sampling Process	:	Samples Delivered by Customer			

MATERIALS TEST REPORT

Laboratory Number		P3248	P3249			
Field Number		-	-			
Position in field / Location		TP 08 - Pipeline				
Depth (m)		0 - 0.4	0.4 - 1.0			
Sample Description		Dk.Br. Silty Sands	Lt.Br. Silty Sands			
Stabilising Agent		Natural	Natural			
Sieve Analysis (Wet Preparation) SANS 3001 - GR 1						
100.0 mm	Percentage Passing					
75.0 mm						
63.0 mm						
50.0 mm						
37.5 mm						
28.0 mm						
20.0 mm			100			
14.0 mm			99			
5.0 mm		100	92			
2.0 mm		97	82			
0.425 mm		79	67			
0.075 mm		21	20.1			
Grading Modulus	SANS 3001 PR 5	1.03	1.31			
Mechanical Analysis - SANS 3001 - GR 1						
Coarse Sand	(%)	18	17			
Coarse - Fine Sand	(%)	22	18			
Medium - Fine Sand	(%)	21	20			
Fine - Fine Sand	(%)	17	19			
Silt and Clay	(%)	22	25			
Atterberg Limits - SANS 3001 - GR 10 and GR 12						
Liquid Limit	(%)	CBD	CBD			
Plasticity Index	(%)	SP	NP			
Linear Shrinkage	(%)	0.5	0.0			
Materials Classification						
Classification Group Index	#	A-2-4	A-2-4			
COTO (Draft)	#		G8			
COLTO Classification	#		G8			
TRH 14 Classification (1985)	#		G8			
Maximum Dry Density and Optimum Moisture Content - SANS 3001 - GR 30						
Maximum Dry Density	(kg/m^3)		2045			
Optimum Moisture Content	(%)		5.5			
California Bearing Ratio - SANS 3001 - GR 40						
CBR @ 100 % Compaction			22			
CBR @ 98 % Compaction			18			
CBR @ 95 % Compaction			13			
CBR @ 93 % Compaction			11			
CBR @ 90 % Compaction			8			
Swell @ 100 % Compaction			0.35			

Remarks : **The COLTO / TRH 14 / COTO Classifications are only based on the above results. Further testing may be required.**

For Soilco - S. Jayraj (Technical Signatory)
2015-05-12

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

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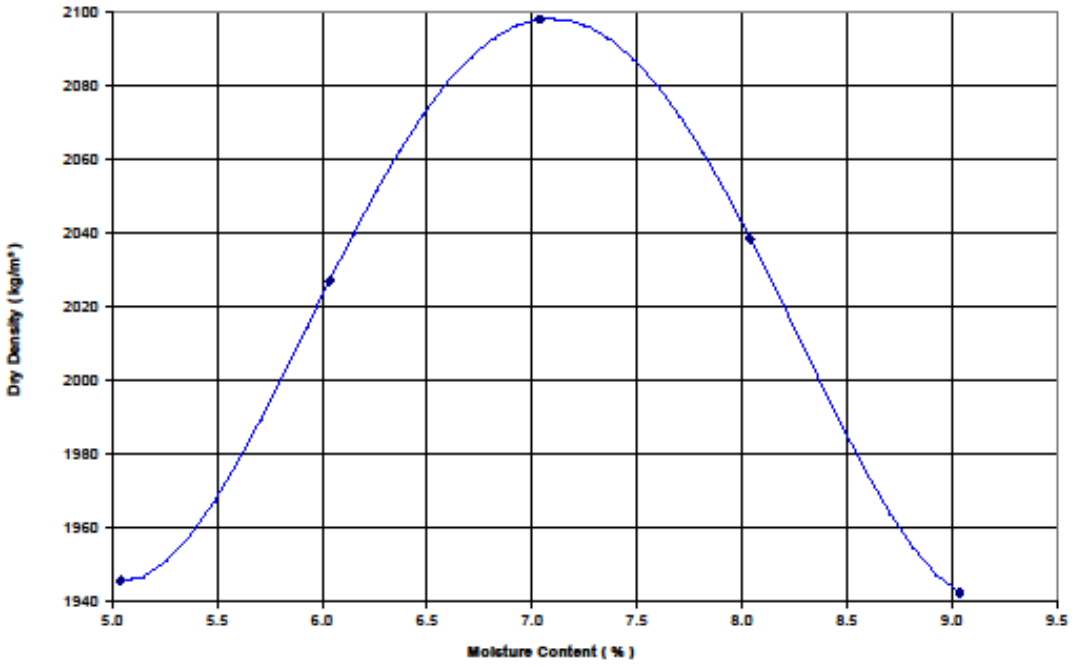
T 0823

Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Reservoir	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

Laboratory Number : P3225 **Field Reference No. :** -
Position in field / Location : TP 01 **Depth (m) :** 0 - 0.4
Material Description : Dk. Br. Silty Sands **Condition of Sample :** Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	5.0	6.0	7.0	8.0	9.0	Maximum Dry Density	2098 kg/m³
Dry Density (kg/m³)	1946	2027	2098	2039	1942	Optimum Moisture Content	7.0 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S. Jayraj (Technical Signatory)

2015-04-06 Revision 2 Page 14 of 26 Soilco SF 38

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

CIVIL ENGINEERING MATERIALS TESTING LABORATORY

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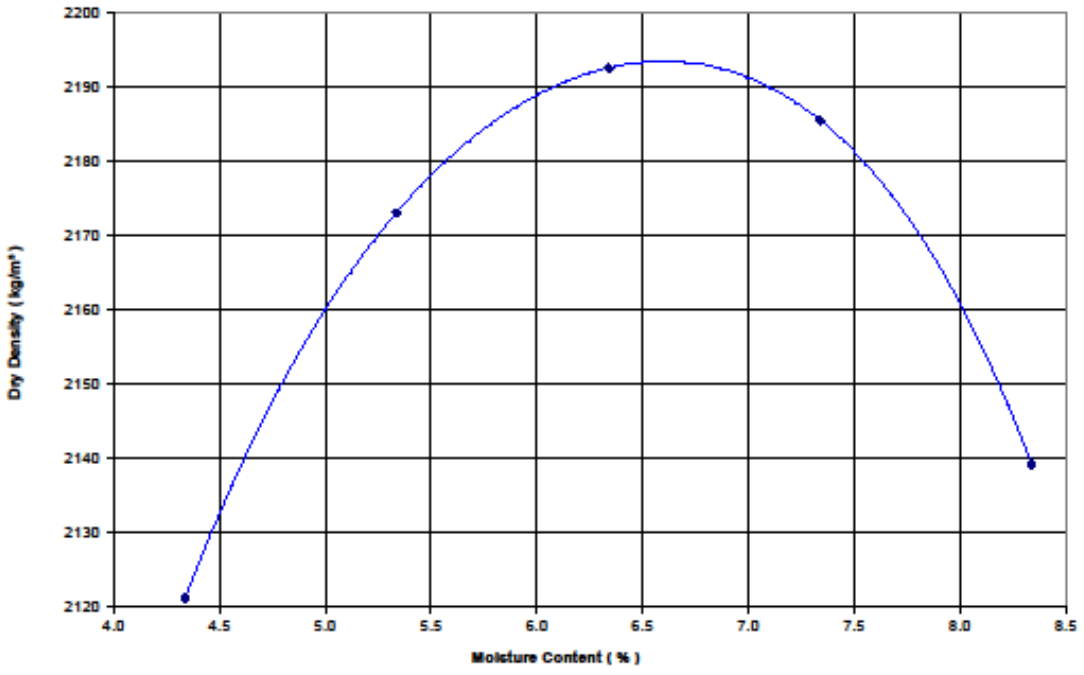
T 0823

Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Reservoir	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

Laboratory Number :	P3226	**Field Reference No. :**	-
Position in field / Location :	TP 01	**Depth (m) :**	0.4 - 1.6
Material Description :	Lt. Br. Silty Clayey Sands	**Condition of Sample :**	Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	5.3	6.3	7.3	8.3	4.3	Maximum Dry Density	2193 kg/m³
Dry Density (kg/m³)	2173	2193	2186	2139	2121	Optimum Moisture Content	6.6 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S. [illegible] (Technical Signatory)

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2015-04-08 Revision 2 Soilco SF 36

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

CIVIL ENGINEERING MATERIALS TESTING LABORATORY

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Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Reservoir	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

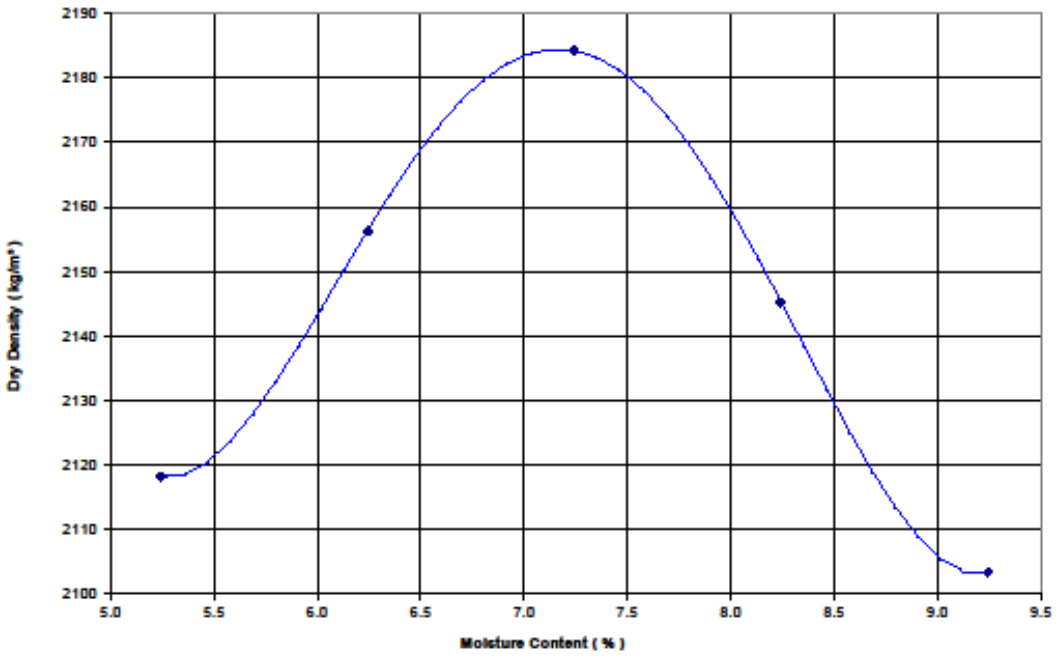
Laboratory Number : P3228 **Field Reference No. :** -

Position in field / Location : **Depth (m) :** 0.3 - 1.6

Material Description : Lt.Br. Silty Clayey Sands **Condition of Sample :** Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	5.2	6.2	7.2	8.2	9.2	Maximum Dry Density	2184 kg/m³
Dry Density (kg/m³)	2118	2156	2184	2145	2103	Optimum Moisture Content	7.1 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S. Jayrao (Technical Signatory)

2015-04-08 Revision 2 Soilco SF 36

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

CIVIL ENGINEERING MATERIALS TESTING LABORATORY

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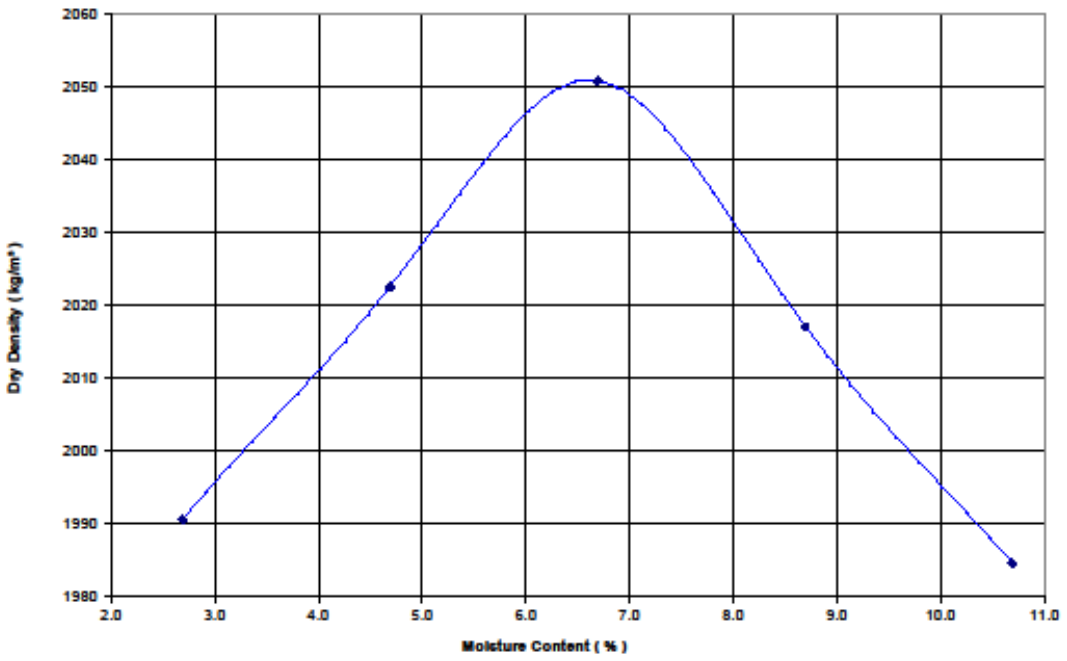
sanas T 0623

Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Reservoir	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

Laboratory Number : P3229 **Field Reference No. :** -
Position in field / Location : TP 03 **Depth (m) :** 0 - 0.3
Material Description : Dk.Br Silty Sands **Condition of Sample :** Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	4.7	6.7	8.7	10.7	2.7	Maximum Dry Density	2051 kg/m³
Dry Density (kg/m³)	2023	2051	2017	1985	1991	Optimum Moisture Content	6.7 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S. Jayraj (Technical Signatory)

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2015-04-06 Revision 2 Soilco SF 36

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

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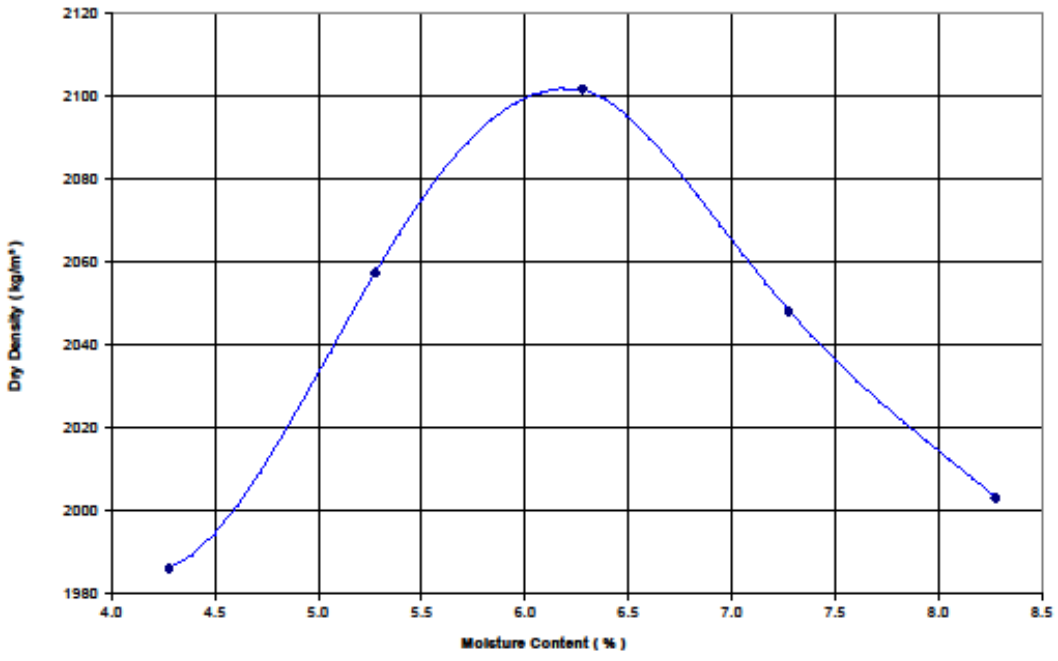
Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Pipeline	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

Laboratory Number :	P3234	**Field Reference No. :**	-
Position in field / Location :	TP 01	**Depth (mm) :**	0.28 - 0.8
Material Description :	Lt.Br. Silty Sands with Shale	**Condition of Sample :**	Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	4.3	5.3	6.3	7.3	8.3	Maximum Dry Density	2102 kg/m³
Dry Density (kg/m³)	1986	2057	2102	2048	2003	Optimum Moisture Content	6.2 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S. Jayram (Technical Signatory)

2015-04-08 Revision 2 Soilco SF 36

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD

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TELEPHONE : 033 386 9095 TELEFAX : 033 386 1878 email : shikar@soilco.co.za

T 0823

Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Pipeline	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

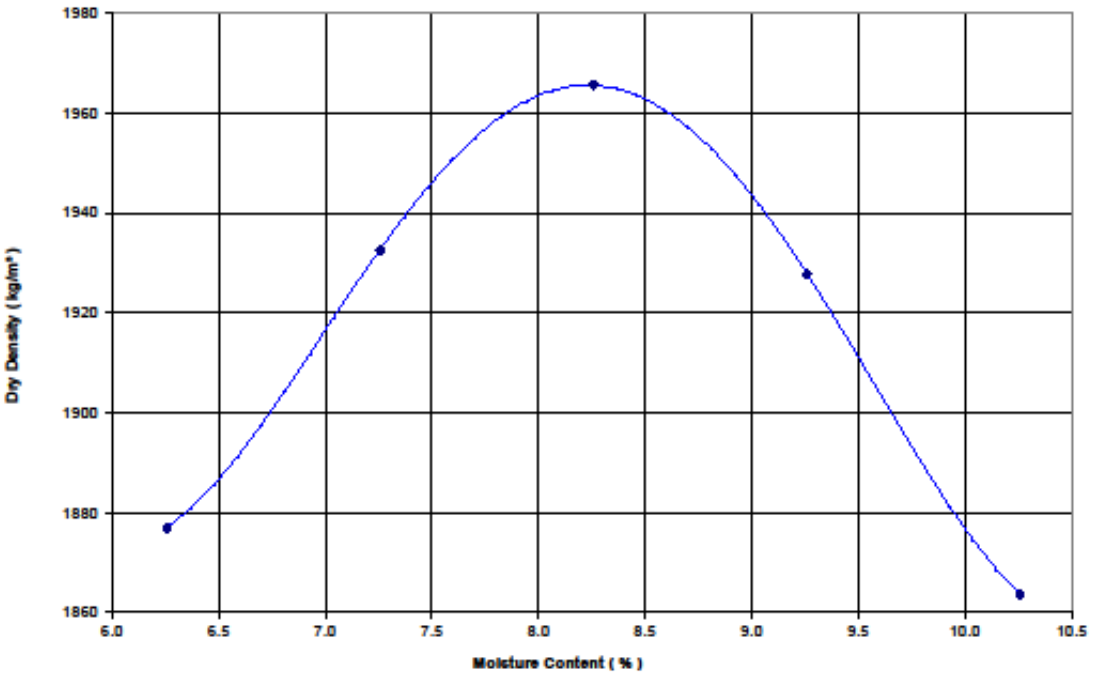
Laboratory Number : P3236 **Field Reference No. :** -

Position in field / Location : TP 02 **Depth (m) :** 0 - 0.8

Material Description : Dk.R. Silty Sands **Condition of Sample :** Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	6.3	7.3	8.3	9.3	10.3	Maximum Dry Density	1966 kg/m³
Dry Density (kg/m³)	1877	1933	1966	1928	1863	Optimum Moisture Content	8.3 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S Jayraj (Technical Signatory)

2015-04-08 Revision 2

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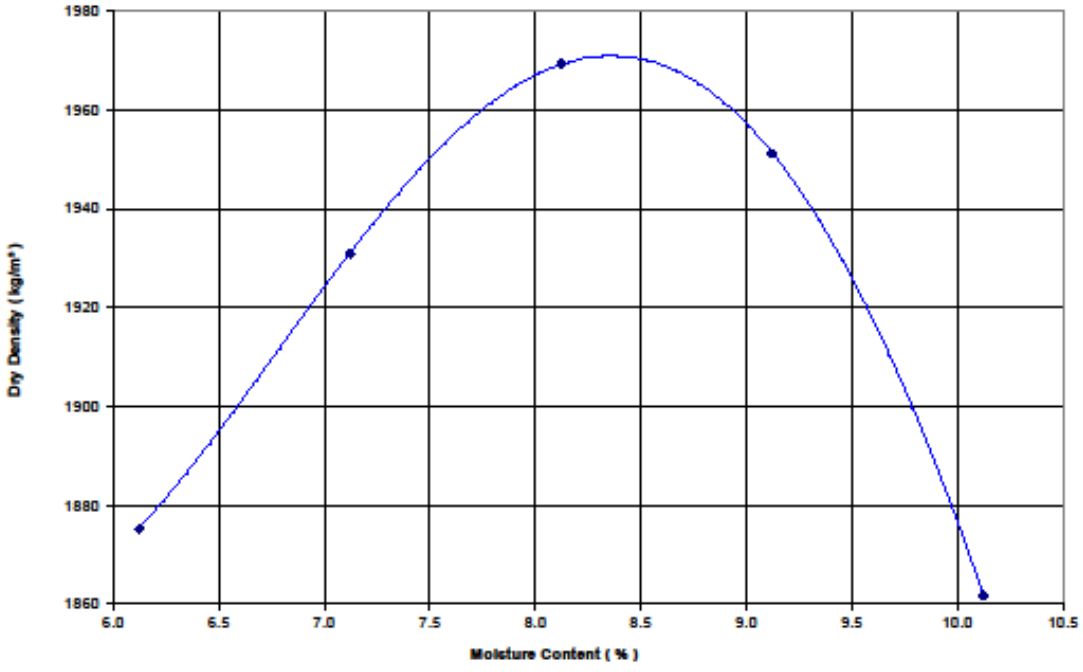
Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Pipeline	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

Laboratory Number : P3236 A
Field Reference No. : -
Position in field / Location : TP 02
Depth (m) : 0.8 - 1.0
Material Description : Lt.R. Silty Clayey Sands
Condition of Sample : Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	6.1	7.1	8.1	9.1	10.1	Maximum Dry Density	1971 kg/m³
Dry Density (kg/m³)	1875	1931	1969	1951	1862	Optimum Moisture Content	8.3 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S. Jayraj (Technical Signatory)

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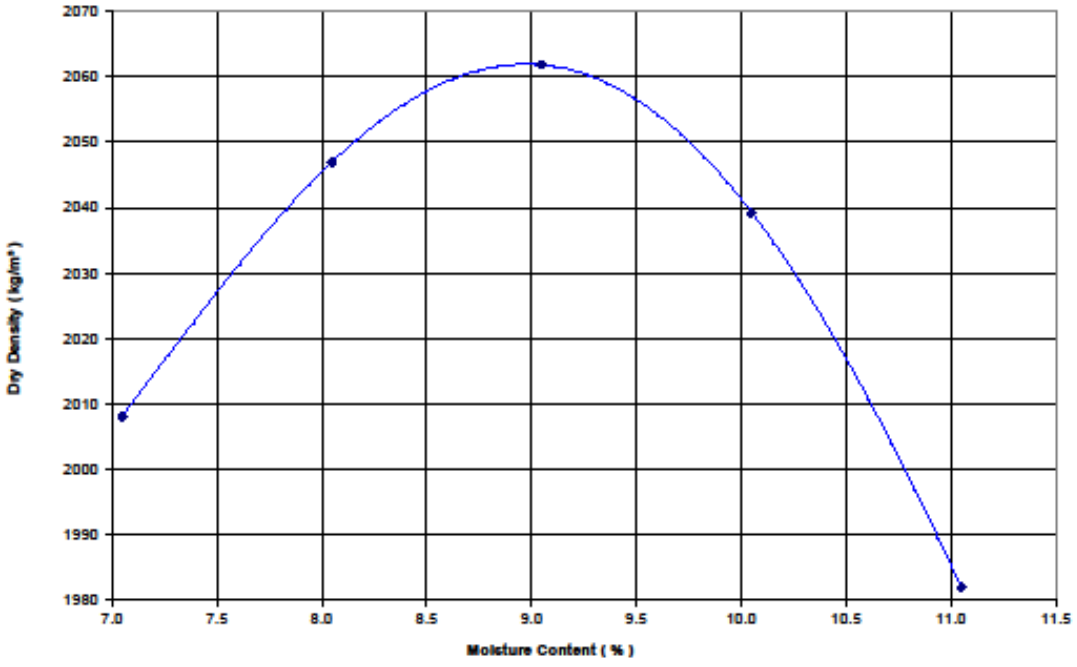
sanas T 0823

Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Pipeline	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

Laboratory Number : P3238 **Field Reference No. :** -
Position in field / Location : TP 03 **Depth (mm) :** 0.2 - 1.0
Material Description : Lt. R. Silty Clayey Sands **Condition of Sample :** Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	7.0	8.0	9.0	10.0	11.0	Maximum Dry Density	2062 kg/m³
Dry Density (kg/m³)	2008	2047	2062	2039	1982	Optimum Moisture Content	8.9 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S. Jayraj (Technical Signatory)

2015-04-08 Revision 2 Soilco SF 38

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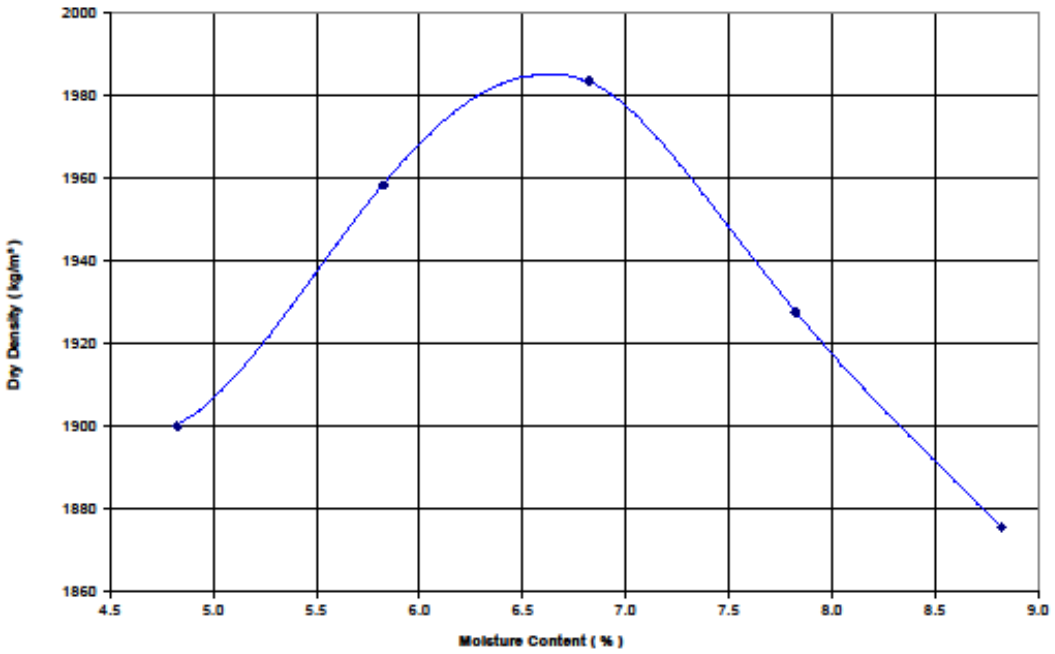
Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Pipeline	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

Laboratory Number :	P3239	**Field Reference No. :**	-
Position in field / Location :	TP 04	**Depth (m) :**	0 - 0.6
Material Description :	Lt.Br. Silty Sands + Weathered Sandstone	**Condition of Sample :**	Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	4.8	5.8	6.8	7.8	8.8	Maximum Dry Density	1985 kg/m³
Dry Density (kg/m³)	1900	1958	1983	1928	1876	Optimum Moisture Content	6.6 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S. Jayram (Technical Signatory)

2015-04-06 Revision 2 Soilco SF 30

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sanas T 0823

Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Pipeline	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

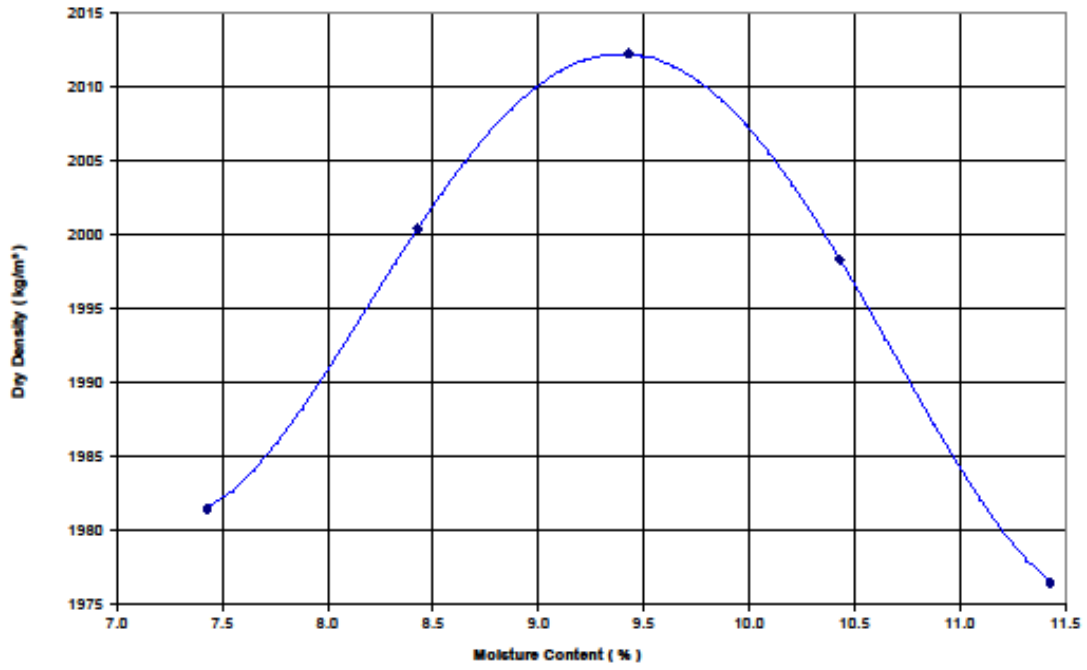
Laboratory Number : P3240 **Field Reference No. :** -

Position in field / Location : TP 04 **Depth (m) :** 0.6 - 1.0

Material Description : White Reddish Weathered Sandstone **Condition of Sample :** Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	7.4	8.4	9.4	10.4	11.4	Maximum Dry Density	2012 kg/m³
Dry Density (kg/m³)	1982	2000	2012	1998	1977	Optimum Moisture Content	9.4 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S. Jayraj (Technical Signatory)

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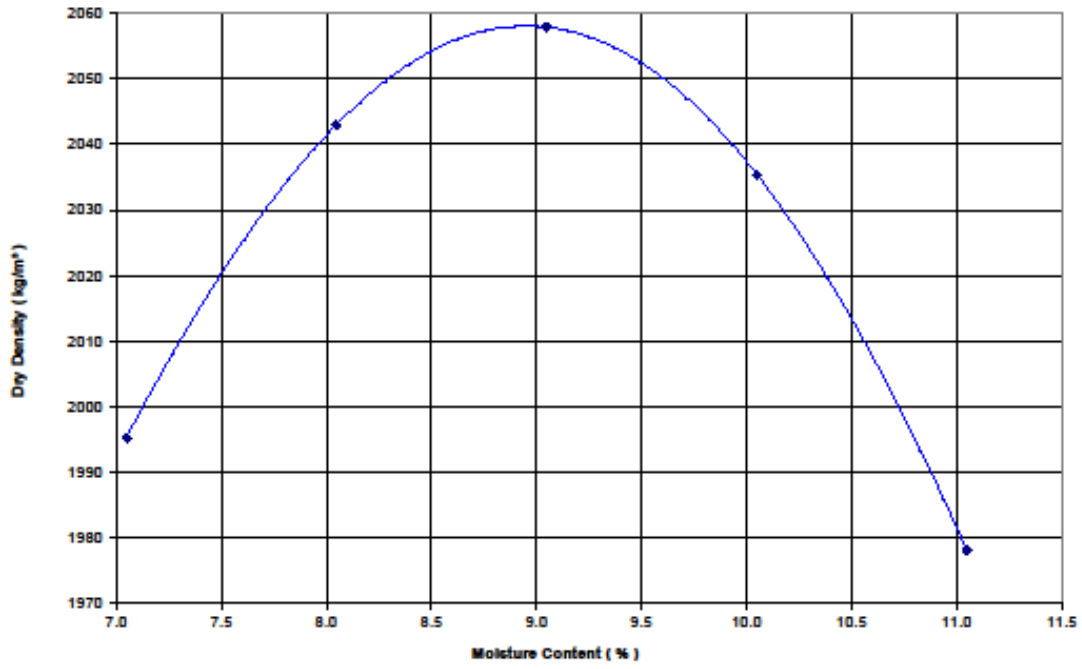
Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Pipeline	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

Laboratory Number : P3242 **Field Reference No. :** -
Position in field / Location : TP 05 **Depth (m) :** 0.4 - 0.9
Material Description : Lt.Br. Silty Sands **Condition of Sample :** Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	7.0	8.0	9.0	10.0	11.0	Maximum Dry Density	2058 kg/m³
Dry Density (kg/m³)	1995	2043	2058	2035	1978	Optimum Moisture Content	8.9 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco :
S. Jayraj (Technical Signatory)

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Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Pipeline	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

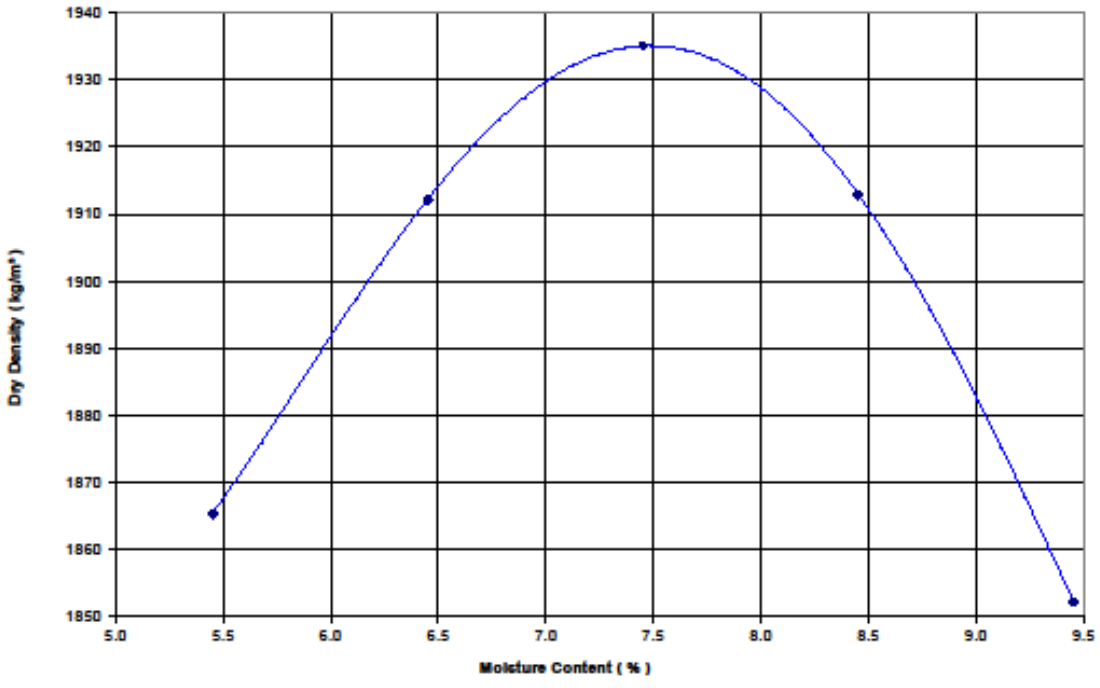
Laboratory Number : P3245 **Field Reference No. :** -

Position in field / Location : TP 06 **Depth (m) :** 0.5 - 1.0

Material Description : Dk.Br. Silty Sands **Condition of Sample :** Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	5.5	6.5	7.5	8.5	9.5	Maximum Dry Density	1935 kg/m³
Dry Density (kg/m³)	1886	1912	1935	1913	1852	Optimum Moisture Content	7.6 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S. Jayraj (Technical Signatory)

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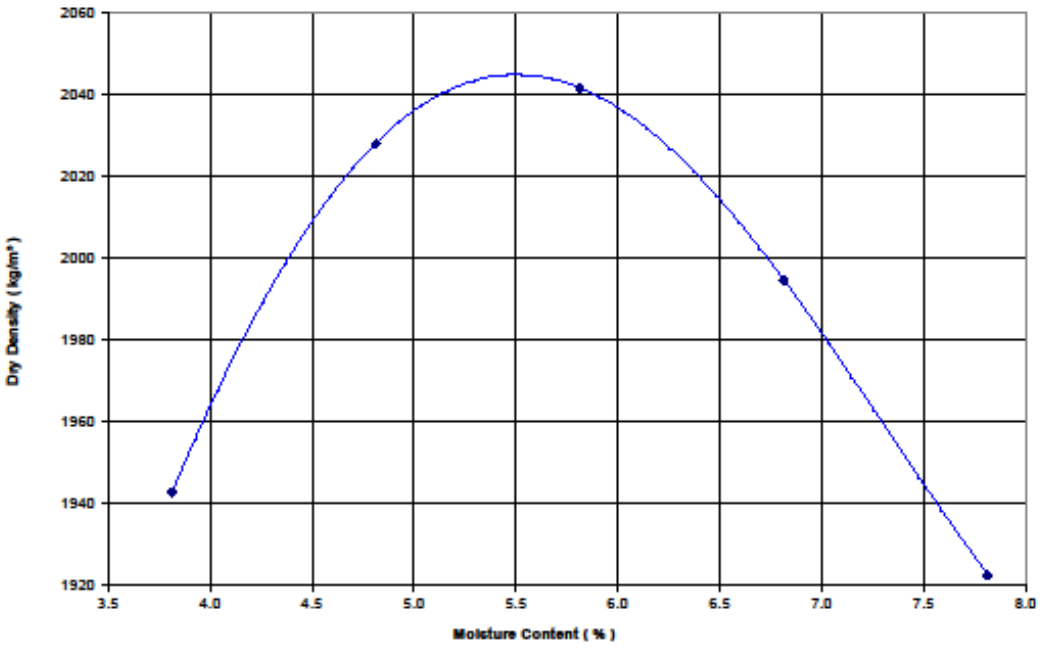
Client :	BAV Consulting	**Job Card No. :**	259167
Project :	Carolina Bulk Water Supply - Pipeline	**Date Received :**	2025-04-16
		Date Tested :	2025-04-16 to 2025-05-15
Environmental Conditions :		**Date Reported :**	2025-05-16
Sampling Process :	Samples Delivered by Customer	**Date Sampled :**	2025-04-16

Laboratory Number :	P3249	**Field Reference No. :**	-
Position in field / Location :	TP 08	**Depth (m) :**	0.4 - 1.0
Material Description :	Lt.Br. Silty Sands	**Condition of Sample :**	Moist

MOISTURE / DENSITY RELATIONSHIP - SANS 3001 - GR 30

Moisture Content; (%)	3.8	4.8	5.8	6.8	7.8	Maximum Dry Density	2045 kg/m³
Dry Density (kg/m³)	1943	2028	2042	1995	1923	Optimum Moisture Content	5.5 %



Remarks :

Method of Preparation : All Material passed the 20mm Sieve

For Soilco : S. Jayraj (Technical Signatory)

2015-04-06 Revision 2

Annexure D: CALLM Supply Chain Management Policy

Annexure E: MBD 6.2 – ANNEXURE C LOCAL CONTENT