DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

TENDER NO: T14/2026

APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL SEWER PUMP STATIONS

ISSUED BY:

The Municipal Manager
Dr. Pixley Ka Isaka Seme Local Municipality
Private Bag X9011
VOLKSRUST, 2470

Tel: +27 (0) 17 734 6100
Fax: +27 (0) 86 630 2209

PREPARED BY

DLV Project Managers and Engineers
144 Mark Street,
Vryheid
3100

Tel: (034) 980 7242
Fax: (034) 983 2765

NAME OF TENDERER: ……...

SUPPLIER NO AS PER CSD……

TENDER AMOUNT (INCL.VAT@15%):……..

CLOSING DATE: 05 DECEMBER 2025 AT 12:00

EXPANDED PUBLIC WORKS PROGRAMME

SUMMARY FOR TENDER OPENING PURPOSES

(To facilitate the reading out of tender parameters at the opening of tenders, the tenderer shall complete this form and submit it with his tender)

Name of Contractor submitting the tender :	
CSD NUMBER:	
Tender Amount : *(as stated in the Form of Offer)*	
Alternative Tender offered? :	(*Yes /No*)
If "Yes" state amount :	*R*
Time for Completion :	_____***Months***
Maximum time for Completion:	***10 Months***
Details of contact person :	
Name *(Print)* :	
Telephone No :	
Fax No *:*	
E-mail address (*if available*) :	

(Note: In the event of conflict between the data provided in this summary and that given in the tender, the latter shall prevail.)

SIGNATURE*:* _____

(of person authorised to sign the tender)

APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL SEWER PUMP STATIONS

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T1.1	Tender Notice and Invitation to Tender	T.5 -T6	White
T1.2	Tender Data	T.7 –T.31	Pink
Part T2: Returnable Documents		**T.32– T.87**	
T2.1	List of Returnable Documents	T.32	Yellow
T2.2	Returnable Schedules	T.33 –T.87	Yellow
The Contract (Volume 2)			
Part C1: Agreement and Contract Data		**C.1 – C.13**	
C1.1	Form of Offer and Acceptance	C.2 – C.6	Yellow
C1.2	Contract Data	C.7 – C.13	Yellow
Part C2: Pricing Data		**C.14 – C.62**	
C2.1	Pricing Instructions	C.14– C.16	Yellow
C2.2	Bills of Quantities	C.17 – C.121	Yellow
Part C3: Scope of Work			
C3	Scope of Work	C.122	Blue
Part C4: Site Information		**C.259**	
Part C5: Annexures		**C.260**	
C5.1	Drawings	C.261	White

The Tenderer shall also satisfy himself that this document is complete in accordance with the above contents and if any pages are found to be missing, or duplicated, shall immediately request the Engineer to rectify the discrepancy. No liability will be admitted by the Employer in respect of errors in the Tenderer's Offer due to the foregoing.

EXPANDED PUBLIC WORKS PROGRAMME

TENDER

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T1 TENDERING PROCEDURES

T1.1 TENDER NOTICE AND INVITATION TO TENDER

DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

TENDER NOTICE

Tenders are hereby invited from service providers to submit bids for the tender as detailed below in the table:

TENDER NO.	PROJECT NAME	CIDB GRADING	ENQUIRIES	COMPULSORY BRIEFING SESSION DATE & TIME	CLOSING DATE AND TIME
T14/2026	APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL SEWER PUMP STATIONS.	6ME or higher.	Ms. M.Ralinotsi Tel: 017 734 6100 or Ms M. Mabhengu for Technical enquiries.	N/A	Friday, 05 December 2025 at 12:00.

Tender documents will be obtainable from **Monday, 24 November 2025** from **09:00** at the Finance Department (Volksrust Offices) upon payment of a non-refundable tender levy for an amount of **R649.20** or may be downloadable free of charge from www.etenders.gov.za. Only cash and EFT payment will be accepted. No compulsory briefing session will be held for this tender.

Duly completed tenders must be sealed in an envelope clearly marked: "MUNICIPAL MANAGER, DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY, TENDER NO. AND PROJECT NAME (as indicated in the table above) - CLOSING DATE: **as indicated above must be placed in the tender box at Dr Pixley Ka Seme Local Municipality offices, c/o Adelaide Tambo Street & Dr Nelson Mandela Drive in Volksrust where tenders will be opened in public.**

Late tenders, **incomplete tender documents and tenders per email or fax will not be accepted and the Dr Pixley Ka Isaka Seme Local Municipality** does not bind itself to accept the lowest or any tender. Dr Pixley Ka Isaka Seme Local Municipality reserves itself the right to accept a tender as a whole or in part. All the **administrative enquiries can be directed to Ms. M.Ralinotsi – Tel: 017 734 6100 during office hours.**

M.A NGCOBO
MUNICIPAL MANAGER

Notice Number: 82/2025

EVALUATION CRITERIA

The following Stages of Evaluation will be carried out in the evaluating Tenders:

Stage 1: Administrative Compliance
Stage 2: Functionality Criteria
Stage 3: Preference Point System

ADMINISTRATIVE COMPLIANCE (STAGE 1)

All the bids will be evaluated against the administrative responsiveness requirements as set out in the listof returnable documents T2.1

FUNCTIONALITY EVALUATION (STAGE 2)

The functional evaluation will be done as outlined below. Should a Bidder not achieve the minimum specified points (70) for functionality, the Bidder will be regarded as non-responsive and not be consideredfor the next evaluation stages and will be disqualified.

FUNCTIONALITY CRITERIA
The following criteria will be applied when bids are assessed for functionality:

1. Company Experience – 35 Points
2. Qualification and Experience of the site key personnel's – 30 Points
3. Labour Intensive Design and Construction Methods and SMME Development – 15 Points
4. Plant and equipment – 10 Points
5. Construction Method Statement – 10 Points

T1.2 TENDER DATA

1. GENERAL

The Conditions of Tender reproduced in Section 3 are the Standard Conditions of Tender as contained in Annex F of SANS 294 – *Construction Procurement Processes, Methods and Procedures* which contain references to the Tender Data for details that apply specifically to this tender.

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

The Tender Data contained hereafter in Section 2 shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

Each item of Tender Data given below is cross-referenced to the relevant clause in the standard Conditions of Tender.

2. TENDER DATA APPLICABLE TO THIS TENDER

F.1.1 The Employer for this Contract is: **DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY**

F.1.2 Tender Documents

(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
T2.2: Returnable schedules and forms

CONTRACT

Part 1: Agreements and Contract Data
C1.1: Form of Offer and Acceptance
C1.2: Contract Data

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

The Tender Document 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 F.1.4 The Employer's details:

Name: Dr. Pixley Ka Isaka Seme Local Municipality

Address: c/o Adelaide Tambo & Dr. Nelson Mandela Drive Volksrust, 2470

Tel: 017 734 6100

Fax: 086 630 2209

E-mail: records@pixleykaseme.gov.za

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

The Employer is not obliged to accept the lowest or any tender offer.

F.2.1 Eligibility

A Tenderer will not be eligible to submit a tender if:

(a) the contractor submitting the tender is under restrictions or has principals who are under restriction to participate in the Employer's procurement due to corrupt or fraudulent practices;

(b) the Tenderer does not have the legal capacity to enter into the contract;

(c) the contractor submitting the tender is insolvent, in receivership, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of the foregoing;

(d) The Tenderer does not comply with the legal requirements stated in the Employer's procurement policy;

(e) The Tenderer cannot demonstrate that he possesses the necessary technical qualifications and competencies, financial resources, equipment and other physical facilities, managerial capability, personnel, experience and reputation to perform the contract; or

(f) The Tenderer cannot provide proof that he is in good standing with respect to duties, taxes, levies and contributions required in terms of legislation applicable to the work in the contract.

TENDERER'S TO TAKE PARTICULAR NOTICE OF THIS CLAUSE AS TENDERERS WHO DO NOT COMPLY HEREWITH WILL NOT BE CONSIDERED ELIGIBLE.

TENDER QUALIFICATION: LABOUR INTENSIVE CONTRACTS

Only those tenderers who can demonstrate that they will have in their employ, management and supervisory staff satisfying the requirements of the scope of work for labour-intensive competencies for supervisory and management staff during the validity of the contract are eligible to submit tenders.

To qualify for award of the Contract, tenderers shall meet the following minimum qualifying criteria:

(a) Having participated in and graduated with fully satisfactory results from the relevant national qualification framework training organized under EPWP (or other similar project) and applying trained supervisory staff on a full-time basis for the execution of the works. LIC NQF Level 5.

(b) Liquid assets/or credit facilities covering the expected expenditures for two full work months

(c) Proposals for timely acquisition (own, lease, hire, etc.) of the essential minimum equipment

(d) The contractor will carry out the works using labour-based work methods as described in the Special Conditions of Contract

The tenderer must submit to the Employer, names of all management and supervisory staff

that will be employed to supervise the labour-intensive portion of the works together with satisfactory evidence that such staff members satisfy the eligibility requirement. The contractor shall ensure that the minimum supervisor to worker ratio of 1:20 for effective supervision of Labour intensive works for all LI activities.

Schedule of Labour Content
The minimum Labour Content for this Project shall be 10% calculated as the amount spend on labour wage divided by the total value of the project. The minimum job creation targets on the project shall be:

	Total	**Women**	**Youth**	**Disabled**
Work Opportunities	25	5	12	1
Person Days	6000	1200	2880	240
Training Days	20	5	5	5

F.2.7 Site visit and clarification meeting

The arrangements for the clarification meeting are as follows:

Location: Refer to Tender Advertisement/email
Date : Refer to Tender Advertisement/email
Starting time : Refer to Tender Advertisement/email

Enquiries and confirmation of attendance at least one full working day in advance regarding the meeting and site inspection may be directed to:

Ms.M. Ralinotsi Tel 017 734 6100 or M. M.Mabhengu for Technical enquiries.

F.2.12 Alternative tenders

If a Tenderer wishes to submit an alternative tender offer, the only criteria permitted for such an alternative tender offer are:

(a) Individual items

Individual items offered as alternatives to items in the Bill of Quantities will only be considered if listed and priced in Form R: *Amendments, Qualifications and Alternatives* in Part 2 of the Contract Document, accompanied by a detailed statement as necessary.

(b) Alternative designs

Where a Tenderer desires to submit an alternative tender involving modifications to the design or method of construction that would alter the character of the tender, the following procedure must be observed:

(i) The alternative offer must be accompanied by supporting information, drawings, calculations and a priced alternative Bill of Quantities to enable its technical acceptability, construction time and price to be fully assessed. Such information, drawings and Bill of Quantities must be sufficient for the proper evaluation of the tendered alternative, otherwise the offer will not be considered;

(ii) Any alternative tender involving modifications to the design will be assessed on its merits and may be accepted. An accepted alternative design will become the design for the purpose of the contract.

(iii) If an alternative design with its priced Bill of Quantities has been accepted, the sum thus tendered for the alternative will not be subject to re-measurement and will be the final amount payable to the Contractor, except only for variations arising from:

- Changes in design parameters ordered by the Engineer;
- Changes not arising from any failure or fault of the Contractor, but from

modifications requested by the Engineer.

(iv) A decision whether or not to adopt a technically acceptable modified design will be governed by the amount of the overall saving and the advantages to the Employer which the modified design can be reliably expected to achieve. Matters to be considered in arriving at the overall saving will include the effect of any deferment in starting date arising from extra time needed for the preparation of an amended contract for signature.

(v) The priced alternative Bill of Quantities must include an amount equal to 5% of the amount tendered therein to cover the Employer's costs of checking the alternative design offered.

F.2.13 Submitting a Tender Offer

F.2.13.5 Tender offers shall be submitted as an original only.

Under no circumstances whatsoever may the tender forms be retyped or redrafted.
Photocopies of the original tender documentation may be used, but an original signature must appear on such photocopies.

F.2.13.6 A two-envelope procedure will **not** be followed.

The Employer's address and identification details are as follows:

Location of Tender box:		Refer to tender Advertisement
Physical address:		Refer to tender Advertisement
Identification details	Refer to tender Advertisement	APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL SEWER PUMP STATIONS
	Title of Tender	
	Closing Date	Refer to tender Advertisement
	Time	Refer to tender Advertisement

F.2.15 Closing Time

The closing time for submission of Tender Offers is **as per tender advert.**
Telephonic, telegraphic, facsimile, telex, electronic or e-mailed tenders will not be accepted.

F.2.16 Tender Validity

All tenders shall remain valid for a period of ninety (90) days after the time and date set for the opening of tenders, or until the Tenderer is relieved of this obligation by the Employer, in writing, at an earlier date. However, the Tenderer may be requested in writing, not later than fourteen (14) days before this validity period will lapse, to extend the validity of this tender for a specific period. The written approval of the Tenderer must then be received before the lapsing of the original validity period, in order to remain valid.

Should a Tenderer –

- Withdraw his tender during the period of its validity; or
- give notice of his inability to execute the contract or fail to execute the contract; or
- fail to sign the contract agreement or furnish the required security within the period fixed in the Contract Data or any extended time agreed to by the Employer;

then he shall be liable for and pay to the Employer –

- all expenses incurred in calling for fresh tenders, if it should be necessary;

- the difference between his tender and any less favorable tender accepted either by fresh tenders being called or by another tender being accepted from those already received;

- any escalation of the final contract price resulting from any delay caused in calling for fresh tenders :

Provided always that the Employer may exempt a Tenderer from the provisions here of, if it is of the opinion that the circumstances justify such exemption.

F.2.19 Access

Access shall be provided for inspections and testing by personnel acting on behalf of the Employer.

F.2.22 Return of Tender Documents

As per the advert.

F.2.23 Certificates

The following certificates must be provided with the tender:

- Original, Valid Tax Clearance Certificate and Tax reference number, Request reference number and PIN obtained from SARS.
- A certified copy of B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS) or Sworn Affidavit confirming annual turnover and level of black ownership and in case of all EMEs and QSEs with 51% black ownership or more
- National Treasury Central Supplier Database Compliance Information (CSD), containing registration confirmation status of National Treasury with MAAA" supplier reference number.
- Joint Venture Agreement and Power of Attorney in case of Joint Ventures;
- VAT Registration Certificate from the South African Revenue Services (SARS);
- Company / CC / Trust / Partnership registration certificates;
- Proof that payment for municipal services is up to date not more than 90 days; and
- Certified Copies of Identity Document in the case of one-man concerns

F.3.4 Opening of Tender Submissions

The time, date and location for the opening of the tender offers is as follows:

Time:	**Refer to tender Advertisement**
Date:	**Refer to tender Advertisement**
Location / Venue:	**Refer to tender Advertisement**

F.3.5 The two envelope system **will not** apply to this tender.

F.3.11 Evaluation of Tender Offers

F.3.11.1 The procurement policy adopted by this contract will give effect to Section 217(2) of the Constitution and as published in Government Gazette no 16085, dated 23 November 1994.

F.3.11.2 Tenders will be evaluated in two stages in accordance with the standard tender evaluation Method 2 : Financial Offer and Preferences as follows:

STAGE 1 : TEST FOR RESPONSIVENESS/ELIGIBILITY

In order for a tender to be considered responsive, it must comply with **ALL** of the following criteria:

(a) The tender documentation must be completed and signed in all respects;
The Contractor must have the required CIDB grading;
(b) The tender documentation must include all necessary and applicable documentation

as listed in F.2.23 above; and

(c) The tender must comply with the eligibility criteria noted in F.2.1; and
In terms of F.2.1(e), the following specific criteria must be proven by the tenderer:

i) That the tenderer possesses the necessary on-site, management expertise and capability to carry out the contract
ii) That the tenderer has the financial capacity to carry out the contract; and
iii) That the tenderer has ready access to the plant and equipment required to carry out the contract

The responsiveness of a tender will be assessed by scoring the bid according to the criteria detailed in the table overleaf.

It is incumbent on the Tenderer to ensure that the returnable documents in T2 are completed in sufficient detail to enable the score to be properly assessed. If the information provided renders a specific criterion not being fully complied with, then the bid will be scored on the next criterion down.

TENDERER'S MUST SCORE A MINIMUM OF 70% IN ORDER FOR THE BID TO BE ELIGIBLE IN TERMS OF F.2.1 (e).

ELIGIBILITY CRITERIA

EVALUATION CRITERIA

The following Stages of Evaluation will be carried out in the evaluating Tenders:

Stage 1: Administrative Compliance
Stage 2: Functionality Criteria
Stage 3: Preference Point System

ADMINISTRATIVE COMPLIANCE (STAGE 1)
All the bids will be evaluated against the administrative responsiveness requirements as set out in the listof returnable documents T2.1

FUNCTIONALITY EVALUATION (STAGE 2)

The functional evaluation will be done as outlined below. Should a Bidder not achieve the minimum specified points (70) for functionality, the Bidder will be regarded as non-responsive and not be considered for the next evaluation stages and will be disqualified.

FUNCTIONALITY CRITERIA
The following criteria will be applied when bids are assessed for functionality:

1. Company Experience – 35 Points
2. Qualification and Experience of the site key personnel's – 30 Points
3. Labour Intensive Design and Construction Methods and SMME Development – 15 Points
4. Plant and equipment – 10 Points
5. Construction Method Statement – 10 Points

Company Experience (35)

No	Functional Requirements-Company Experience		Weight
1.1	**Company Experience – Mechanical and pumps**		
	Proof of relevant projects completed in the past 5 years of comparable scope of work and similar type – Installation and refurbishment of Pumps and mechanical works exceeding a value of R 5 million. Provide proof such as appointment letter, final Approval or Completion Certificate of the relevant projects completed within the last 5 years to be attached. As well as reference letter with contract value, be signed by the Client, and contain the Client's contact details.		**15 Points**
	5 projects completed 4 projects completed 3 projects completed 2 projects completed 1 project completed 0 project completed	15 points 12 points 9 points 6 points 3 points 0 points	
No	**Functional Requirements - Company Experience**		**Weight**
1.2	**Company Experience- Electrical**		
	Proof of relevant projects completed in the past 5 years of comparable scope and similar type – Construction or Refurbishment of electrical works exceeding a value of R 4 million (Electrical Scope of work). Comparable Scope of work includes the Electrical design, supply, installation & automation, commissioning of the following: • Motor Control Centers and Distribution Boards for mechanical equipment for pumpstation		**10 Points**

	• Programmable Logic Controllers • Control and instrumentation, Network and Telemetry systems • Earthing and lightning protection; and • Small Power and Lighting Provide proof such as appointment letter, final Approval or Completion Certificate of the relevant Electrical projects completed within the last 5 years to be attached. As well as reference letter with contract value, be signed by the Client, and contain the Client's contact details. N.B: In case of sub-contracting, also attach letter of appointment for the main Contractor from the client and a Completion Certificate, duly signed by the contracting party and the appointed Contractor on the project.		
	5 projects completed 4 projects completed 3 projects completed 2 projects completed 1 project completed 0 project completed	10 points 8 points 6 points 4 points 2 points 0 points	
1.3	**Company Experience-Civil**		
	Proof of relevant projects completed in the past 2 years of comparable scope and similar type - Construction or Refurbishment of Civil works exceeding a value of R 4 million (Civil scope of works). Final Approval or Completion Certificate of the relevant Civil projects completed within the last 5 years to be attached. Certificate must display contract value, be signed by the Client, and contain the Client's contact details. N.B: In case of sub-contracting, also attach letter of appointment for the main Contractor from the client and a Completion Certificate, duly signed by the contracting party and the appointed Contractor on the project.		**10 Points**
	5 projects completed 4 projects completed 3 projects completed 2 projects completed 1 project completed 0 project completed	10 points 8 points 6 points 4 points 2 points 0 points	

Key Personnel (30)

No	Functional Requirements-Key Staff		Weight
2.1	**Key Staff: Contracts Manager**		
	Key Staff's experience is relevant to the scope of works; mechanical, pumps & Mechanical design, supply, installation & automation, commissioning. Contracts Manager with NQF level 7 or higher in Mechanical or Electrical Engineering. Attach certified copies of both, proof of qualifications, & detailed CV indicating years of experience & details of staff's experience of a similar nature are compulsory. Evaluation of Contracts Manager's Experience		**15 Points**
	Experience 9 years and above post-graduate experience 7 to 9 years post-graduate experience 5 to 7 years post-graduate experience Below 5-year post-graduate experience **Qualification: Electrical/Mechanical Engineering** Bachelor's or B Tech Degree or above National Diploma No Proof of Qualifications & Detailed CV	 10 points 7 points 5 Points 0 points 5 Points 3 Points 0 Points	

2.2	**Key Staff: Site Agent**		
	Key Staff's experience is relevant to the scope of works, Experience on Electrical & Mechanical design, supply, installation & automation, commissioning. Site Agent with NQF level 6 or higher in Engineering, Attach certified copies of both, proof of qualifications, & detailed CV indicating years of experience & details of staff's experience of a similar nature are		**15 Points**
	Experience 5 years and above post-graduate experience 3 to 5 years post-graduate experience Below 3-year post-graduate experience **Qualification: Electrical/Mechanical Engineering** National Diploma N6 - Nated Diploma No Proof of Qualifications & Detailed CV	 10 points 5 points 0 points 5 Points 3 Points 0 Points	

Labour Intensive Design and Construction Methods and SMME Development – 15 Points

3	**Key Staff: - LIC Manager/Supervisor**		**weight**
	Contractors shall employ in labour-enhanced works only those supervisory and management staff that have completed the required Skills Programme in terms of the "Guidelines for the implementation of labour-enhanced infrastructure projects under the Expanded Public Works Programme (EPWP) Third Edition 2015": • Foremen / Supervisors at NQF level 4 "National Certificate: Supervision of Civil Engineering Construction Processes"; • Site Agent / Construction Manager at NQF level 5 "Manage Labour-Intensive Construction Processes" or equivalent Quality Council for Trades and Occupations (QCTO) qualifications at NQF level 5 or 7. Tenderers' attention is drawn to the required minimum supervisor to worker ratio for this project stated in clause E2.3 of Part E of the Particular Specifications. The Tenderer must insert in the spaces provided below the relevant details of the personnel to be employed in the construction of the Works possessing the required qualifications in the supervision or management of LIC projects. Evaluation of LIC Supervisor/Manager Experience		**15 Points**
	Experience 6 years and above post-certificate experience 3 to 6 years post-certificate experience Below 3-year post-certificate experience **Qualification: LIC Certificate** NQF 7 NQF 5 No Proof of certificate	 10 points 6 points 3 points 5 Points 3 Points 0 Points	

Plant and equipment – (10 Points)

4	**Plant and Equipment**	**weight**
	Contractors shall have a Proof of Plant and equipment ownership where owned by the Tender and/or where plant will be hired out to the tender attach an original letter indicating so. (**Registration documents of plant owned or letter of intent to rent the relevant plant with registration documents must be attached)** **List of Plant and equipment:** 1. LDV on site = 3 Points 2. Truck = 3 Points 3. TLB = 4 Points	**10 Points**

Construction Method Statement – (10 Points)

5	**Construction Method Statement**		
	The Construction Method Statement (CMS) is a crucial document in the construction industry that outlines the step-by-step procedures and methodologies to be employed during the construction of a project. Its importance lies in several key aspects: 1. Safety Compliance 2. Regulatory Compliance 3. Project Understanding: 4. Risk Management 5. Quality Assurance 6. Project Coordination 7. Communication Tool 8. Environmental Considerations 9. Client and Stakeholder Confidence 10. Contractual Requirement		**10 Points**
	5 Excellent reports Good report Satisfactory report Fair report Poor report No Submission Report	10 points 8 points 6 points 4 points 2 points 0 points	

a) Dr Pixley Ka Isaka Seme Local Municipality reserves the right to contact references submitted by the bidder.
b) Bids that do not achieve a minimum score of 70 points (out of 100) for functionality will not be evaluated further and will not proceed to the next stage of the Bid Evaluation process.

Please note should any of the nominated staff be replaced, the successfully appointed service provider will be required to ensure that such replacements must have equivalent criteria as above and this need to be approved by Dr Pixley Ka Isaka Seme Local Municipality.

STAGE 3 : PREFERENCE POINT SYSTEM

All tenders that meet the stage 1 criteria for responsiveness will progress through to the evaluation phase as set out in Returnable F (MBD 5).

F.3.11.3 Points scored for price (Contract Value more than R 50 000 000)

The 90/10 preference point system will be used to allocate points for tenders in this category.

F.3.11.4 Points scored for price (Contract Value less than R 50 000 000)

The 80/20 preference point system will be used to allocate points for tenders in this category.

SPECIFIC GOALS (Stage 3)

1. GENERAL CONDITIONS

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

It is estimated that tenders on this contract will be evaluated on the 80/20

preference point system

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

The specific goals allocated points in terms of this tender	Number of points allocated (80/100 system) (To be completed by the organ of state)	Number of points claimed (80/20 system) (To be completed by the tenderer)
At least 51%Black	5	
At least 51%Youth	5	
At least 51%Woman	3	
People with Disability	2	
Locality- Dr Pixley Ka Isaka Seme LM	5	
TOTAL	20	

Annex F: Standard Conditions of Tender

(As contained in Annexure F of Board Notice 12 of 2009: Standards for Uniformity in Construction Procurement)

F.1 General

F.1.1 Actions

F.1.1.1 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, comply with all legal obligations and not engage in anticompetitive practices.

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

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

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

F.1.1.3 The employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

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) **conflict of interest** means any situation in which:

i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfil his or her duties impartially;
ii) an individual or organisation is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
iii) incompatibility or contradictory interests exist between an employee and the organisation which employs that employee.

b) **comparative offer** means the tenderer's financial offer after all tendered parameters that will affect the value of the financial offer have been taken into consideration in order to enable comparisons to be made between offers on a comparative basis;

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

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

e) **organization** means a company, firm, enterprise, association or other legal entity, whether incorporated or not, or a public body

f) **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 be 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.1.6 Procurement procedures

F.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to F.3.13, be concluded with the tenderer who in terms of F.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submission that are received at the closing time for tenders.

F.1.6.2 Competitive negotiation procedure

F.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of F.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of F.3.8 relating to the material deviations or qualifications which affect the competitive position of tenders shall not apply.

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

provisions of F.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

F.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to make a fresh tender offer, based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

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

F.1.6.3 Proposal procedure using the two stage-system

F.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

F.1.6.3.2 Option 2

F.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

F.1.6.3.2.2 The employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data, and award the contract in terms of these conditions of tender.

F.2 Tenderer's obligations

F.2.1 Eligibility

F.2.1.1 Submit a tender offer only if the tenderer complies with 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.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

F.2.2 Cost of tendering

Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with the 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) may not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

F.2.10 Pricing the tender offer

F.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes (except Value Added Tax (VAT), and other levies payable by the successful 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 Unless stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed.

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

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 legibly in non-erasable 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 shall not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

F.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

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. Accept that proof of posting shall not be accepted as proof of delivery.

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 with or without any conditions attached to such extension.

F.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted.

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

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.

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 requests from the tenderer

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

F.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to pre-qualify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

a) an individual firm, or joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements.
b) the new partners to a joint venture were not pre-qualified in the first instance, either as individual firms or as another joint venture; or
c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

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 of the Tender Notice until three days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, 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 and, where applicable, 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, after opening and before detailed evaluation, whether each tender offer properly received:

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

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) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
(c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

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

F.3.9 Arithmetical errors, omissions or discrepancies

F.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

F.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with F.3.11 for:

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

quantities or schedules of prices; or

ii) the summation of the prices.

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

F.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

a) If bills of quantities or pricing schedules apply and there is an error in the line-item total resulting from the product of the unit rate and the quantity, the line-item total shall govern and the rate shall be corrected.

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

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

F.3.11.2 Method 1 : Financial offer

In the case of a financial offer:

a) Rank tender offers from the most favourable to the least favourable comparative offer.
b) Recommend the highest ranked tenderer for the award of the contract, unless there are compelling and justifiable reasons not to do so.
c) Re-rank all tenderers should there be compelling and justifiable reasons not to recommend the highest ranked tenderer and recommend the highest ranked tenderer, unless there are compelling and justifiable reasons not to do so and the process set out in the subclause is repeated.

F.3.11.3 Method 2 : Financial offer and preference

In the case of a financial offer and preferences:

a) Score each tender in respect of the financial offer made and preferences claimed, if any, in accordance with the provisions of F.3.11.7 and F.3.11.8.
b) Calculate the total number of tender evaluation points (T_{EV}) in accordance with the following formula:

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

Where : N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;
N_P is the number of tender evaluation points awarded for preferences claimed in accordance with F.3.11.8.

c) Rank tender offers from the highest number of evaluation points to the lowest.
d) Recommend the tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.

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

F.3.11.4 Method 3: Financial offer and quality

In the case of a financial offer and quality:

a) Score each tender in respect of the financial offer made and the quality offered in accordance with the provisions of F.3.11.7 and F.3.11.9, rejecting all tender offers that fail to score the minimum number of points for quality stated in the tender data, if any
b) Calculate the total number of tender evaluation points (T_{EV}) in accordance with the following formula:

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

Where: N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;
N_Q is the number of tender evaluation points awarded for quality offered in accordance with F.3.11.9.

c) Rank tender offers from the highest number of evaluation points to the lowest.
d) Recommend the tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
e) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in the sub clause is repeated.

F.3.11.5 Method 4 : Financial offer, quality and preferences

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

a) Score each tender in respect of the financial offer made and the quality offered in accordance with the provisions of F.3.11.7 and F.3.11.9, rejecting all tender offers that fail to score the minimum number of points for quality stated in the tender data, if any
b) Calculate the total number of tender evaluation points (T_{EV}) in accordance with the following formula:

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

Where : N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;
N_P is the number of tender evaluation points awarded for preference claimed in accordance with F.3.11.8.
N_Q is the number of tender evaluation points awarded for quality offered in accordance with F.3.11.9.

c) Rank tender offers from the highest number of evaluation points to the lowest.
d) Recommend the tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
e) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in the sub-

clause is repeated.

F.3.11.6 Decimal places

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

F.3.11.7 Scoring Financial Offers

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

$N_{FO} = W_1 \times A$

where: N_{FO} is the number of tender evaluation points awarded for the financial offer.
W_1 is the maximum possible number of tender evaluation points awarded for the financial offer as stated in the Tender Data.
A is a number calculated using the formula and option described in Table F.1 as stated in the Tender Data.

Table F.1 : Formulae for calculating the value of A

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

[a] P_m is the comparative offer of the most favourable comparative offer.
P is the comparative offer of the tender offer under consideration.

F.3.11.8 Scoring preferences

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

F.3.11.9 Scoring quality

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

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

$N_Q = W_2 \times S_o / M_s$

where: S_O is the score for quality allocated to the submission under consideration;
M_s is the maximum possible score for quality in respect of a submission.
W_2 is the maximum possible number of tender evaluation points awarded for the quality as stated in the tender data

F.3.12 Insurance provided by the employer

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

Accept the tender offer, if in the opinion of the employer, it does not present any unacceptable commercial risk and only if the tenderer:

a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,
b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract,
c) has the legal capacity to enter into the contract,
d) is not insolvent, in receivership, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of any of the foregoing,
e) complies with the legal requirements, if any, stated in the tender data, and
f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

F.3.14 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, and
c) other revisions agreed between the employer and the successful tenderer.

F.3.15 Complete adjudicator's contract

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

F.3.16 Notice to unsuccessful tenderers

F.3.16.1 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.

F.3.16.2 After the successful tenderer has been notified of the employer's acceptance of the tender, notify other tenderers that their tender offers have not been accepted.

F.3.17 Provide copies of the contracts

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

F.3.18 Provide written reasons for actions taken

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

F4. JOB CREATION REPORTING FOR EPWP

In order to assist the Employer in complying with the goals of creating EPWP job opportunities, the Contractor must provide the following information for reporting purposes:

F4.1 Type of project data required per project

Every EPWP project shall collect and keep specific project data for the purpose of EPWP progress reporting. ***The data that is required to be kept and maintained for each project includes:***

F4.1.1 Beneficiary data

A beneficiary list must be maintained for every project. The data required in this beneficiary list is indicated below. This data shall be recorded, checked and signed off by the Contractor on a weekly basis, and shall be submitted to the Employer at each monthly site meeting. The beneficiary list shall contain the following data and shall be kept and maintained on site for audit purposes:

(a) Beneficiary identity – name, surname, initials, date of birth and identity number (or other unique identifier) plus certified copy of ID book (or other unique identifier).

(b) Beneficiary profiles – nationality, gender, age, education level and disability status.

(c) Monthly work data for beneficiaries – daily wage to be received, number of calendar days training attended and number of calendar days worked.

F4.1.2 Project work data

This generally seeks to confirm the number of people at work daily on the project. The following data must be recorded and maintained on site by the Contractor, in order that it can be provided by the Employer to the National Department of Public Works upon request when the latter is undertaking sample auditing. The documentation that should be kept includes:

(a) Daily attendance register – register for each day showing all the workers that were registered as being at work on that day. Attendance registers shall be completed on site on a daily basis and signed off by the Contractor on a weekly basis.

(b) Summary of monthly attendance.

F4.1.3 Project payment data

This generally seeks to confirm what was paid, for how much work and to whom. It is required that the Contractor adopt one of the following methods as standard procedure for recording and maintaining this information:

(a) Payment register – this is a list of the workers showing the wages paid to each worker, and signed off by each worker as proof of receipt and acceptance of payment. Information on this register must include the name of the worker, either an identity number or other unique identifier, the number of calendar days that the pay period covers, the wage rate and the total wages paid.

Alternatively,

(b) Bank records showing the transfers to each worker account, signed off by the Contractor as proof of payment – these bank records must specifically show the name of the worker, either an identity number or other unique identifier, the period which the pay covers and the total wages paid.

The project payment data, as recorded and maintained by the Contractor in terms of either (a) or (b) above, must be available and applicable for the entire period for which the Employer claims an incentive reward for person-days of work created in terms of the project.

F4.1.4 Employment output data

The Contractor shall submit to the Employer at each monthly site meeting the data necessary to enable the Employer to calculate the following employment output data:

(a) Number of work opportunities created (where <u>one</u> work opportunity = paid work created for

one individual on an EPWP project, for any period of time).

(b) Number of person-days of work created (where one person-day = one day of work carried out by one individual). The total number of person-days of work created on a particular EPWP project shall be obtained by summing the total number of person-days worked by each individual employed during the course of that EPWP project.

(c) Number of Full Time Equivalents (FTEs) created (= total number of person-days of work created on the EPWP project divided by 230 working days). In terms of EPWP policy, one year of work created for one individual is assumed to comprise a total of 230 days of paid work carried out by that individual.

(d) Average duration of work opportunities created (= total number of person-days of work created on the EPWP project divided by the number of work opportunities created on that EPWP project).

(e) Average daily wage rates paid (= accumulated total of the wages paid to all individuals employed on an EPWP project divided by the total number of person-days of work created on that EPWP project).

3 The offer portion of the C1.1 Offer and Acceptance
4 C1.2 Contract Data (Part 2)

5 C2.2 Bills of quantities

A: CERTIFICATE OF ATTENDANCE AT CLARIFICATION MEETING

This is to certify that *(Tenderer)* ……..….

of (*address)*.....

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

We acknowledge that the purpose of the meeting was to acquaint myself / ourselves with the site of the works and / or matters incidental to doing the work specified in the tender documents in order for me / us to take account of everything necessary when compiling our rates and prices included in the tender.

Particulars of person(s) attending the meeting:

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

Capacity: .....

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

Capacity: .....

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

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

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

B: RECORD OF ADDENDA TO TENDER DOCUMENTS

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

ADD. No.	DATE	TITLE OR DETAILS
1		
2		
3		
4		
5		

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

C: CERTIFICATE OF AUTHORITY OF AN ENTITY

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 FOR COMPANY

I ....., chairperson of the Board of Directors of ....., hereby confirm by resolution of the Board (copy attached) taken on ..... 20....., that Mr/Ms ....., acting in the capacity of ....., was authorised to sign all documents in connection with this tender and any contract resulting from it on behalf of the company.

Signature of Chairman: .....

Signature of Signatory: .....

As Witnesses:

1..... .....
Signature Name in Block Letters

2..... …….....
Signature Name in Block Letters

Date: .....

(II) CERTIFICATE FOR CLOSE CORPORATION

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

.....hereby authorise Mr/Ms .....

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

Signature of Signatory: .....

As Witnesses:

1..... .....

Signature Name in Block Letters

2..... …….....

Signature Name in Block Letters

Date: .....

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 authorise

Mr/Ms…..... …… acting in the capacity of

..... , to sign all documents in connection

with the tender for Contract No ..... and any contract resulting from it on our behalf.

Signature of Signatory: .....

As Witnesses:

1..... .....

Signature Name in Block Letters

2..... …….....

Signature Name in Block Letters

Date: .....

NAME	ADDRESS	SIGNATURE	DATE

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

(IV) CERTIFICATE FOR JOINT VENTURE

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorize

Mr/Ms....., authorized signatory of the company,

……..…….…….....acting in the capacity of lead partner, to sign all documents in

connection with the tender offer for Contract No .....and any contract resulting from it on our behalf.

This authorization is evidenced by the attached power of attorney signed by legally authorized signatories of all the partners to the Joint Venture.

Signature of Signatory: .....

As Witnesses:

1..... .....

Signature Name in Block Letters

2..... …….....

Signature Name in Block Letters

Date: .....

NAME OF FIRM	ADDRESS	AUTHORISING SIGNATURE, NAME AND CAPACITY
Lead partner		

Note: This certificate is to be completed and signed by all of the key partners upon who rests the direction of the affairs of the Partnership 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:

1..... .....

Signature Name in Block Letters

2..... …….....

Signature Name in Block Letters

Date: .....

D: REGISTRATION CERTIFICATES OF AN ENTITY

ENTITY REGISTRATION:

[Important note to Tenderer: Registration Certificates for Companies, Close Corporations and Partnerships and ID documents for Sole Proprietors, must be inserted here. In the case of a Joint Venture, a copy of a duly signed Joint Venture Agreement clearly setting out the roles and responsibilities of the parties must be included with particular reference to the guarantees required in terms of the Contract Data. The Joint Venture Agreement must also clearly indicate how payment is to be effected to the entity and distributed to the parties]

E: CIDB REGISTRATION

Tenderer's must also indicate their CIDB registration details in the space provided.
(*If not registered, attach proof that the enterprise can be registered with the CIDB within 10 days*)

Registered Name	**Registration Number**

F: BBBEE CERTIFICATION:

The Tenderer must also attach hereto a certified copy of their B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS), or a sworn affidavit confirming annual turnover and level of black ownership in case of all EMEs and QSEs.

G: BIDDER'S QUESTIONNAIRE

PART A
INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY					
BID NUMBER:	T142026	CLOSING DATE:	05 DECEMBER 2026	CLOSING TIME:	12:00
DESCRIPTION	APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL SEWER PUMP STATIONS				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (MBD1).					

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

Dr Pixley ka Isaka Seme Local Municipality Offices (Entrance Foyer)
Cnr Adelaide Tambo Street and Dr Nelson Mandela Drive
Volksrust
2470

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:		**AND**	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**	DEPARTMENT	**Technical Services**
CONTACT PERSON	**Ms. M. Ralinotsi**	CONTACT PERSON	**Ms M. Mabhengu**
TELEPHONE NUMBER	**017 734 6000**	TELEPHONE NUMBER	**017 734 6135**
FACSIMILE NUMBER	**086 630 2209**	FACSIMILE NUMBER	**086 630 2209**
E-MAIL ADDRESS	**melodyr@pixleykaseme.gov.za**	E-MAIL ADDRESS	**mendym@pixleykaseme.gov.za**

PART B
TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:

1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.

1.2. **ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED–(NOT TO BE RE-TYPED) OR ONLINE**

1.3. 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: ……..

H: DECLARATION OF GOOD STANDING REGARDING TAX

The original Tax Pin must be submitted together with the bid. Failure to submit the Tax Pin will result in the invalidation of the bid. In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Pin.

MBD 2 Tax Pin Requirements

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

1. In order to meet this requirement bidder is required to complete in full the attached form TCC 001 "Application for a Tax Clearance Certificate" and submit it to any SARS branch office nationally. The Tax Pin Requirements are also applicable to foreign bidders / individuals who wish to submit bids.
2. SARS will then furnish the bidder with a Tax Pin that will be valid for a period of 1 (one) year from the date of approval.
3. The original Tax Pin must be submitted together with the bid. Failure to submit the original and valid Tax Pin will result in the invalidation of the bid. Certified copies of the Tax Pin will not be acceptable.
4. In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Pin.

ATTACH THE FOLLOWING DOCUMENTS AS AN ANNEXURE TO THE TENDER DOCUMENT WITH REFERENCE TO THE APPLICABLE RETURNABLE SCHEDULE:

- Latest proof of Registration with Central Supplier Database (CSD)
- SARS e-filling PIN

I: DECLARATION OF INTEREST (MBD 4)

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

- No bid will be accepted from persons in the service of the state*.
- 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 authorized 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 person 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

……

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 THE DECLARATION PROVE TO BE FALSE.

……. ……
SIGNATURE **DATE**

…….. ……...
POSITION **NAME OF TENDERER**

*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.

J: DECLARATION FOR PROCUREMENT ABOVE R10 MILLION (ALL APPLICABLE TAXES INCLUDED) (MBD 5)

This form shall only be completed if the Tender Sum exceeds R10 million (all applicable taxes included).

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

   YES / NO (Delete whichever is not applicable)

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 (Delete whichever is not applicable)

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 (Delete whichever is not applicable)

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 (Delete whichever is not applicable)

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 THE DECLARATION PROVE TO BE FALSE.

…….. ……
SIGNATURE **DATE**

…….. ……....
POSITION **NAME OF TENDERER**

K: PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022 (MBD 6.1)

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

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

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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 To be completed by the organ of state

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

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

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

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

(a) Price; and

(b) Specific Goals.

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

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

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

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

2. DEFINITIONS

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

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

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

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

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

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

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

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

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

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = Price of lowest acceptable tender

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

3.2.1. POINTS AWARDED FOR PRICE

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

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

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

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

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

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

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

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

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

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

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

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

The specific goals allocated points in terms of this tender	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (80/20) system) (To be completed by the tenderer)
At least 51%Black	5	
At least 51%Youth	5	
At least 51%Woman	3	
People with Disability	2	
Locality- Dr Pixley Ka Isaka Seme LM	5	
TOTAL	**20**	

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm…….

4.4. Company registration number: ……...

4.5. TYPE OF COMPANY/ FIRM

- ϒ Partnership/Joint Venture / Consortium
- ϒ One-person business/sole propriety
- ϒ Close corporation
- ϒ Public Company

- Personal Liability Company
- (Pty) Limited
- Non-Profit Company
- State Owned Company

[TICK APPLICABLE BOX]

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

i) The information furnished is true and correct;

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

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

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

(a) disqualify the person from the tendering process;

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

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

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

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

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

SURNAME AND NAME: .....
DATE: .....

ADDRESS: .....
.....
.....
.....

L: DECLARATION OF BIDDERS PAST SUPPLY CHAIN MANAGEMENT PRACTICES (MBD 8)

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) wilfully 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.**

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

	any other municipality / municipal entity, that is in arrears for more than three months?		
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 (name) _____

certify that the information furnished on this declaration form is true and correct.

I accept that the state may reject the bid or act against me in terms of paragraph 23 of the general conditions of contract should this declaration prove to be false.

Signature	Date
Position	Name of bidder

M: CERTIFICATE OF INDEPENDENT BID DETERMINATION (MBD 9)

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.

MBD9: CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

CONTRACT NO. T14/2026: APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL SEWER PUMP STATIONS

in response to the invitation for the bid made by:

DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

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

I certify, on behalf of: _____ that:

(Name of Bidder)

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word “competitor” shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:

    (a) has been requested to submit a bid in response to this bid invitation;
    (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
    (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder.

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

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

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: .....
(of person authorised to sign on behalf of the Tenderer)

N: AFFADAVIT OF GOOD STANDING THAT WILL BE INCORPORATED INTO THE CONTRACT

The Tenderer hereby certifies that neither it or any of the principals of the enterprise is listed on the register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector. The Tenderer further certifies that none of its principals have ever been convicted of fraud.

DECLARATION (*to be signed in the presence of a Commissioner of Oaths*)

The undersigned, who warrants that he / she is duly authorized to do so on behalf of the firm, confirms that the contents of this Affidavit are within my personal knowledge, and save where stated otherwise to the best of my belief both true and correct.

Signature: …….

Duly authorized to sign on behalf: ……

Address: …….

……

……

Telephone:……

Signed and sworn to before me at……..on

this the ……day of ……..by the Deponent, who

has acknowledged that he/she knows and understands the contents of this Affidavit, that its true and correct to the best of his/her knowledge and that he/she has no objection to taking the prescribed oath, and that the prescribed oath will be binding on his/her conscience.

Commissioner of oaths ……..

NOTE : This affidavit comprises one (1) page all of which must be initialed by both the Deponent and the Commissioner of Oaths

O: SCHEDULE OF ALL WORK PROVIDED FOR AN ORGAN OF THE STATE OVER THE LAST FIVE YEARS

[Tenderers are to attach a schedule detailing the name of each project, the organ of state for which the project was undertaken and the date the project was completed. If not complete list the project as "current"]

P: BANKING DETAILS

Tenderers financial capacity to finance and undertake a contract of this nature will also be checked and consequently it is a requirement that the details below be provided. a letter from the bank with bank stamp confirming that the tenderer has an active bank account with the bank or a letter generated online from the Bank .

NAME OF TENDERER							
NAME OF ACCOUNT HOLDER AT BANK							
TYPE OF ACOUNT (Please tick)	CURRENT/CHEQUE		SAVINGS		TRANSMISSION		
BANK							
BRANCH NAME							
ACCOUNT NUMBER							
BRANCH CODE							
BANK TELEPHONE NO							
BANK ADDRESS							
NAME OF BANK MANAGER							
TELEPHONE NUMBER							
FAX NUMBER							
NO OF YEARS ABOVE ACCOUNT HAS BEEN WITH BANK							
CREDIT FACILITIES AVAILABLE (State Amount)							

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

Q: SCHEDULE OF THE TENDERER'S EXPERIENCE

Tenderers are to provide references for **FIVE (5)** other recent projects (last five years) of a similar nature with which the company has been involved.

The information provided here will be used to evaluate the Tenderer's eligibility to undertake the contract. It is important that the Tenderer ensure that sufficient and legible information is provided to enable the Employer to evaluate the criteria noted in the table in F.3.11.2.

Name and Telephone Number of Client	Project	Name and Telephone Number of Consulting Engineer / Implementing Agent	Details of service provided

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

R: KEY PERSONNEL

In terms of the Project Specification, all unskilled workers are to be locally sourced.

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	
	PDI	NON-PDI	PDI	NON-PDI	PDI	NON-PDI
Construction Manager						
Site Agent						
Site Foreman						
Artisans and other Skilled Workers						
Unskilled Workers						

Designation	Names	Project Type	Value of Works	Year Completed
LIC NQF 5 Supervisors				

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

S: CURRICULUM VITAE OF KEY PERSONNEL

The Tenderer must indicate who they intend using for this function and must list the incumbent's experience.

Failure to provide proof of a suitable candidate to manage the work on a permanent basis on site during the currency of the contract will result in dis-qualification in terms of Clause F.2.1.

Contract Managers Name:	**Years with firm:**
Qualifications:	
NQF 7 Registration Number/Details:	
Employment Record:	
Experience Record Pertinent to Required Service: **(Indicate no. of years experience managing civil engineering construction projects in building related activities)**	

Site Agent Name:	**Years with firm:**
Qualifications:	
NQF 5 Registration Number:	
Employment Record:	
Experience Record Pertinent to Required Service: **(Indicate no. of years experience managing civil engineering construction projects in building related activities)**	

LIC Manager/Supervisor Name:	**Years with firm:**
Qualifications:	
NQF 5 Registration Number:	
Employment Record:	
Experience Record Pertinent to Required Service: **(Indicate no. of years experience managing civil engineering construction projects in building related activities)**	

Foreman Name:	**Years with firm:**
Qualifications:	
NQF 5 Registration Number:	
Employment Record:	
Experience Record Pertinent to Required Service: **(Indicate no. of years experience managing civil engineering construction projects in building related activities)**	

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

T: SCHEDULE OF PLANT AND EQUIPMENT

It is important that the Tenderer be able to demonstrate that he/she has adequate plant and equipment to efficiently execute the proposed scope of works.

The Tenderer's response to this section will be used in assessing the eligibility of the tender offer.

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

Quantity	Description	Size	Capacity

Attach additional pages if more space is required.

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

Quantity	Description	Size	Capacity

Attach additional pages if more space is required.

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

U: SCHEDULE OF PROPOSED SUB-CONTRACTORS

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

	Name and Address of Proposed Sub-Contractor	Nature and Extent of Work	CIDB Grading	Previous Experience working with this Sub-Contractor
1.				
2.				
3.				
4.				
5.				

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

V: PROVISIONAL PROGRAMME

The Tenderer shall detail below or attach a preliminary programme reflecting the proposed sequence and tempo of execution of the various activities comprising the work for this tender.

The programme must indicate all key activities, time frames and must clearly demonstrate the Tenderer's understanding of the scope of works.

The competency and clarity of the programme will help to inform the Employer's assessment of the Tenderer's eligibility to execute the contract.

PROGRAMME														
ACTIVITY	**WEEKS / MONTHS**													

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

W: SCHEDULE OF LABOUR CONTENT

The tenderer must complete a standard table reflecting the labour force anticipated to be employed on this contract, including labour employed by sub-contractors. The Specified target value is 15%

Type of Labour	Man-Days	Minimum Wage Rate per unit	Total Wage Cost (Excl VAT)
Permanent Staff			
Temporary Staff			
SMME/HDEs Labour			
		Total	
		Percentage	

Notes to Tenderer:

Labour is defined as hourly paid personal

The penalty for non-compliance during the contract or fraudulent disclosure is discussed in contract data (item 5.13.2) .

The minimum Labour Content for this Project shall be 10 % calculated as the amount spend on labour wage divided by the total value of the project. The minimum job creation targets on the project shall be:

	Total	Women	Youth	Disabled
Work Opportunities	30	12	26	2
Person Days	6000	2 000	3700	300
Training Days	15	5	5	5

X: TRAINING SCHEDULE

Name of Training Institution :

Name of Programme :

Trainers Name	Qualification	Subject

Note to tenderer:

Provide details here, or attached hereto, the subjects to be covered and the manner in which training is to be delivered.

Y: AMENDMENTS, QUALIFICATIONS AND ALTERNATIVES

(***This is not an invitation for amendments, deviations or alternatives*** *but should the Tenderer desire to make any departures from the provisions of this contract he shall set out his proposals clearly hereunder. The Employer will not consider any amendment, alternative offers or discounts unless forms (a), (b) and (c) have been completed to the satisfaction of the Employer*).

I / We herewith propose the amendments, alternatives and discounts as set out in the tables below:

(a) AMENDMENTS

PAGE, CLAUSE OR ITEM NO	PROPOSED AMENDMENT

Notes*: (1) Amendments to the General and Special Conditions of Contract are not acceptable;*

(2) The Tenderer must give full details of all the financial implications of the amendments and qualifications in a covering letter attached to his tender.

(b) ALTERNATIVES

PROPOSED ALTERNATIVE	DESCRIPTION OF ALTERNATIVE

Notes: (1) Individual alternative items that do not justify an alternative tender, and an alternative offer for time for completion should be listed here.

(2) In the case of a major alternative to any part of the work, a separate Bill of Quantities, programme, etc, and a detailed statement setting out the salient features of the proposed alternatives must accompany the tender.

(3) Alternative tenders involving technical modifications to the design of the works and methods of construction shall be treated separately from the main tender offer.

(c) DISCOUNTS

ITEM ON WHICH DISCOUNT IS OFFERED	DESCRIPTION OF DISCOUNT OFFERED

Note: The tenderer must give full details of the discounts offered in a covering letter attached to his tender, failing which, the offer will be prejudiced

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

Z: WORKMANS' COMPENSATION REGISTRATION CERTIFICATE (OR PROOF OF PAYMENT OF CONTRIBUTIONS IN TERMS OF THE COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT NO. 130 OF 1993)

[Certified Copy of the Certificate or Proof of Payment thereof obtained from the Workmen's Compensation Commissioner to be inserted here]

AA: TAX CLEARANCE CERTIFICATE

IMPORTANT NOTES:

1. The following is an abstract from the Preferential Procurement Regulations 2017 promulgated with the Preferential Policy Framework Act No 5 of 2000:

   "**Tax clearance certificate**

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

2. The ST 5.1 form, Application for Tax Clearance Certificate (in respect of tenders), must be **completed by the tenderer in every detail and submitted to the Receiver of Revenue** where the tenderer is registered for income tax purposes. The Receiver of Revenue will then furnish the tenderer with a Tax Clearance Certificate that will be valid for 12 months from date of issue. **This Tax Clearance Matters or Certificate must be submitted in the original valid with the tender that is before the closing time and date of the tender.**

Each party to a Consortium/Joint Venture/Sub-contractors must complete a separate Tax Clearance Certificate.

SARS has implemented a new Tax Compliance Status (TCS) system in terms of which a taxpayer is now able to authorize any 3rd party to verify its compliance status in one of two ways: either through the use of an electronic access PIN or through the use of a Original valid Tax Clearance Certificate obtained from the new TCS system. All Bidders are required to provide the following to DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY in order to enable it to verify their tax compliance status:

Trading Name: _____

Tax reference number: _____

Request reference number: _____ and

PIN: _____.

No tender may be awarded to any tenderer whose tax matters have not been declared to be in order by SARS.

[Tax Clearance information must be provided and attached to this page as requested above as obtained from TCS Systems of SARS]

[Failure to provide proof of requested Tax Compliance Status Information will invalidate Service Provider tender offer]

AB: DECLARATION OF PAYMENT OF MUNICIPAL SERVICES

DECLARATION TO CERTIFY THAT:

THE TENDERER HAS NO UNDISPUTED COMMITMENTS FOR MUNICIPAL SERVICES TOWARDS A MUNICIPALITY OF WHICH PAYMENT IS OVERDUE FOR MORE THAN 30 DAYS

[Proof of Payment to be attached to this page]

DECLARATION
The undersigned, who warrants that he/she is duly authorized to do so on behalf of the firm, confirms that there are no undisputed commitments for municipal services towards a municipality of which payment is overdue for more than 30 days to my personal knowledge, and save where stated otherwise to the best of my belief both true and correct.

Signature: …….

Duly authorized to sign on behalf of : ……..

Address: ……

…….

…….

Telephone: ……

Date: ……

MUNICIPAL UTILITY ACCOUNT

DECLARATION BY THE TENDERER

I the undersigned _ _____

_____has
been duly authorized to sign all documents with the Tender for:

CONTRACT NO. T14/2026: APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL SEWER PUMP STATIONS on behalf of

_____
(referred to herein as "the Bidder")
hereby make a declaration as follows:

1. I declare that the bidder and /or any of its director(s) / member(s) does not owe the municipality, or any other municipality and/or municipal entity any amount which is in arrears in respect of any municipal rates and taxes or municipal service charges.

2. I understand and accept that in the event that this declaration is proved to be false, the bid shall be rejected forthwith. All other rights of the municipality (including but not limited to the right to claim damages where applicable) shall remain reserved in full.

SIGNED ON BEHALF OF THE COMPANY

_____

IN HIS CAPACITY AS

_____

DATE

_____

FULL NAMES OF SIGNATORY

ATTACH THE FOLLOWING DOCUMENTS AS AN ANNEXURE TO THE TENDER DOCUMENT WITH REFERENCE TO THE APPLICABLE RETURNABLE SCHEDULE :

- Municipal utility account invoice address must be in line with the address on the CSD (not older that three months), if the address is not the same we will disqualify your bid.
- If the company operates on leased premises, both the lease agreement and the Municipal Utility account invoice must be attached, the same address as in both documents. (failure to do so will lead to disqualification)
- If neither the Director or the bidder is not the person owning the account for municipal utility bidder Must attach proof of agreement to operate in the premises with the person responsible for utility account, should the bidder fail to attach proof will be disqualified.

AC: CONTRACTOR'S HEALTH AND SAFETY DECLARATION

In terms of the Occupational Health and Safety Act No 85 of 1993 a Contractor may only be appointed to perform key services if the *Purchaser* is satisfied that the Contractor has the necessary competencies and resources to carry out the work safely in accordance with the provisions of the Act.

To that effect a person duly authorised 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) herein after referred to as the “Act”

2. I hereby declare that my company has the competence and the necessary resources to safely carry out the services specified under this contract in compliance with the Employer's Health and Safety Specifications.

3. I propose to achieve compliance with the Regulations by one of the following:

(a)	From my own competent resources	***Yes / No**
(b)	From my own resources still to be appointed or trained until competency is achieved	***Yes / No**
(c)	From outside sources by appointment of competent specialist subcontractors	***Yes / No**

(* = *delete whatever is not applicable*)

4. I confirm that copies of my company's approved Health and Safety Plan, will at all times be available for inspection by the *Purchaser*'s personnel, DRPKISLM officials and inspectors of the Department of Labour.

5. I hereby confirm that adequate provision has been made in my tendered rates and prices in the schedule of quantities to cover the cost of all resources, actions, training and all health and safety measures envisaged in the Act and that I will be liable for any penalties that may be applied for failure to comply with the provisions of the Act.

6. I agree that my failure to complete and execute this declaration to the satisfaction of the *Purchaser* will mean that I am unable to comply with the requirements of the Act and accept that my tender will be prejudiced and may as a result be rejected at the discretion of the *Purchaser*.

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

AD: NATIONAL TREASURY'S CENTRAL SUPPLIER DATABASE

Tenderers are required to self-register on National Treasury's Central Supplier Database (CSD) which has been established to centrally administer supplier information for all organs of state and facilitate the verification of certain key supplier information. DRPKISLM is required to ensure that price quotations are invited and accepted from prospective bidders listed on the CSD. Business may not be awarded to a Tenderer who has failed to register on the CSD. Only foreign suppliers with no local registered entity need not register on the CSD. The CSD can be accessed at https://secure.csd.gov.za/. Tenderers are required to provide the CSD summary form and the information below to DRPKISLM in order to enable it to verify information on the CSD:

Supplier Number: _____ Unique registration reference number: _____.

AE: COMPULSORY 3 YEAR AUDITED FINANCIAL STATEMENTS.

AF: PROFORMA FORMS TO BE COMPLETED BY SUCCESSFUL TENDERER

- PERFORMANCE GUARANTEE
- DISCLOSURE STATEMENT
- ADJUDICATION BOARD MEMBER AGREEMENT
- PRO FORMA NOTIFICATION FORM IN TERMS OF OHSA 1993 CONSTRUCTION REGULATIONS 2014
- INSURANCE APPLICATION IF TO BE COVERED BY INSURANCE POLICY AS PROVIDED FOR IN THE CONDITIONS OF CONTRACT

PRO FORMA PERFORMANCE GUARANTEE

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

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means: ……...

Physical address ……..

"Employer" means: ……

"Contractor" means: ……..

"Engineer" means: ……..

"Works" means: ……..

"Site" means: ……..

"Contract" means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contracts 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 of R ……

Amount in words: ……..

"Expiry Date" means: ……

CONTRACT DETAILS

Engineer issues: Interim Payment Certificates, Final Payment Certificate and the Certificate Completion of the Works as defined in the Contract.

PERFORMANCE GUARANTEE

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

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

3. The Guarantor hereby acknowledges that:

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

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

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

4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum

certified by the Engineer in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;

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

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

5. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon 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:

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

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

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

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

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

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

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

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

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

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

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

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

Signed at …….

Date ……..

Guarantor’s signatory (1) ……..

Capacity ……

Guarantor’s signatory (2) ……..

Capacity ……...

Witness signatory (1) …….

Witness signatory (2) …….

PRO FORMA DISCLOSURE STATEMENT

(Please note that words in italics within brackets are items which should be stated)

Date:

Contract: **APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL SEWER PUMP STATIONS**

Contractor: _____

Employer: **DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY**

Engineer: DLV Project Managers & Engineers (Pty) Ltd

Dear Sirs

I am willing and available to serve as ad-hoc Adjudication Board Member in the abovementioned Contract.
In accordance with the General Conditions of Contract for Construction Works Adjudication Board Rules relating to disclosure statements by selected or nominated persons to the adjudication, I hereby state that:

- I shall act with complete impartiality and know of nothing at this time, which could affect my impartiality.
- I have had no previous involvement with this project.
- I do not have any financial interest in this project.
- I am not currently employed by the Contractor, Employer or Engineer.
- I do not have any financial connections with the Contractor, Employer or Engineer.
- I do not have or have had a personal relationship with any authoritative member of the Contractor, Employer or the Engineer which could affect my impartiality.
- I undertake to immediately disclose to the parties any changes in the above position which could affect my impartiality or be perceived to affect same.

Should there be any deviation from the foregoing statements, details shall be given.

I further declare that I am experienced in the work which is carried out under the Contract and in interpreting contract documentation.

Name in full: ……..

Signature: ……..

PRO FORMA ADJUDICATION BOARD MEMBER AGREEMENT

(Please note that words in italics within brackets are items which should be stated)

This Agreement is entered into between:
Adjudication Board Member: *(Name, physical address, postal address, email address, fax number, telephone number and mobile number).*
Contractor: *(Name, physical address, postal address, email address, fax number, telephone number and mobile number).*
Employer: *(Name, physical address, postal address, email address, fax number, telephone number and mobile number).*
The Contractor and the Employer will hereinafter be collectively referred to as the Parties.

The Parties entered into a Contract for *(name of project)* which provides that a dispute under or in connection with the General Conditions of Contract for Construction Works, Third Edition, 2015, must be referred to *(ad-hoc adjudication/standing adjudication).*

The undersigned natural person has been appointed to serve as Adjudication Board Member and together with the undersigned Parties agree as follows:

1. The Adjudication Board Member accepts to perform his duties in accordance with the terms of the Contract, the General Conditions of Contract for Construction Works Adjudication Board Rules and this Agreement.
2. The Adjudicator undertakes to remain independent and impartial of the Contractor, Employer and Engineer for the duration of the Adjudication Board proceedings.
3. The Adjudication Board Member agrees to serve for the duration of the Adjudication Board proceedings.
4. The Parties may at any time, without cause and with immediate effect, jointly terminate this Agreement.
5. Unless the Parties agree, the Adjudication Board Member shall not act as arbitrator or representative of either Party in any subsequent proceedings between the Parties under the Contract. No Party may call the Adjudication Board Members as a witness in any such subsequent proceedings.
6. The standing Adjudication Board's duties shall end upon the Adjudication Board Member(s) receiving notice from the Parties of their joint decision to disband the Adjudication Board.
7. The Adjudication Board Member shall be paid in respect of time spent upon or in connection with the adjudication including time spent travelling:
   a. A monthly retainer of *(amount)* for *(number)* of months, and /or
   b. A daily fee of *(amount)* based on a *(number)* hour day, and/or
   c. A hourly fee of *(amount)*, and/or
   d. A non-recurrent appointment fee of *(amount)* which shall be accounted for in the final sums payable.
8. The Adjudication Board Member's expenses incurred in adjudication work shall be reimbursed at

cost.

Upon submission of an invoice for fees and expenses to the Parties, the *(Contractor/Employer*)* shall pay the full amount within 28 days of receipt of the invoice and he shall be reimbursed by the other party by half the amounts so that the fees and expenses are borne equally by the Parties. Late payment of such invoice shall attract interest at prime plus 3% points compounded monthly at the prime rate charged by the Adjudication Board Member's bank.

This Agreement is entered into by:

Contractor's signature: .....
Contractor's name: .....
Place: .....
Date: .....

Employer's signature: .....
Employer's name: .....
Place: .....
Date: .....

Adjudication Board Member's signature: .....
Adjudication Board Member's name: .....
Place: .....
Date: .....

**Delete the inapplicable party*

PRO FORMA NOTIFICATION FORM IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT 1993, 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 Department of Labour]

1. (a) Name and postal address of Contractor:……..
   .....
   (b) Name of Contractor's contact person: .....
   Telephone number: .....
2. Contractor's workman's compensation registration number: .....
3. (a) Name and postal address of client: .....
   .....
   .....
   (b) Name of client's contact person or agent: .....
   Telephone number .....
4. (a) Name and postal address of designer(s) for the project: .....
   .....
   (b) Name of designer's contact person: .....
   Telephone number .....
5. Name of Contractor's construction supervisor on site appointed in terms of Regulation 6(1): ..... Telephone number: .....
6. Name/s of Contractor's sub-ordinate supervisors on site appointed in terms of regulation 6(2).
   …… .....
7. Exact physical address of the construction site or site office: .....
   .....
8. Nature of the construction work: .....
   …….....
9. Expected commencement date: .....
10. Expected completion date: .....
11. Estimated maximum number of persons on the construction site: .....
12. Planned number of subcontractors on the construction site accountable to Contractor: .....
13. Name(s) of subcontractors already chosen: .....
    .....
    .....
    ……..
    ……..

SIGNED BY:

CONTRACTOR: .....……..... DATE: .....

CLIENT: .....……

VOLUME 2: CONTRACT

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C1 AGREEMENTS AND CONTRACT DATA

C1.1 FORM OF OFFER AND ACCEPTANCE

OFFER

The Employer, identified in the acceptance signature block, has solicited offers to enter into a contract for the procurement of the **T14/2026 APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL SEWER PUMP STATIONS**

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

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

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

……

…… .....……Rand (*In words)*

R…… (in figures)

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

Signature: *(of person authorized to sign the tender)*: .....

Name: (*of signatory in capitals)*: .....

Capacity: (*of Signatory*): .....

Name of Tenderer: (*organisation*): .....

Address: .....

.....

Telephone number: ..... **Fax number:** .....

Witness:

Name / Signature: .....

Date: .....

ACCEPTANCE

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

The terms of the contract are contained in:

Part C1 Agreements and contract data, (which include this agreement)
Part C2 Pricing data
Part C3 Scope of work
Part C4 Site information

and drawings and documents or parts thereof, which may be incorporated by reference into the above listed parts.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto as listed in the returnable 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 form of offer and acceptance. No amendments to or deviations from said documents are valid unless contained in this schedule.

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

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

For the Employer:

Signature: .....

Name: *(in capitals)* .....

Capacity: .....

Name of Employer: DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

Address: Private Bag X9011 VOLKSRUST 2470

Witness:

Name / Signature: ……

Date: .....

SCHEDULE OF DEVIATIONS

Notes:

1. The extent of deviations from the tender documents issued by the Employer before 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 becomes the subject of agreements reached during the process of offer and acceptance, the outcome of such agreement shall be recorded here.

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

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

1. Subject: .....
Details: .....
.....

2. Subject: .....
Details: .....
.....

3. Subject: .....
Details: .....
.....

4. Subject: .....
Details: .....
.....

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

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

For the Tenderer:		**For the Employer:**
_____	**Signature**	_____
_____	**Name**	_____
_____	**Capacity**	_____
Name and address of organisation:		**Name and address of organisation:**
_____		_____
_____ _		_____
_____		_____
_____	**Witness Signature**	_____
_____	**Witness Name**	_____
_____	**Date**	_____

CONFIRMATION OF RECEIPT

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

the _____ (day)

of _____ (month)

20 _____ (year)

at _____(place)

For the Contractor:

……..
Signature

……..
Name

……
Capacity

Signature and Name of Witness:

……
Signature

……
Name

C1.2 CONTRACT DATA

C1.2.1 CONDITIONS OF CONTRACT

C1.2.1.1 GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract for Construction Works Third Edition 2015 published by the South African Institution of Civil Engineering are applicable to this contract. Copies of these conditions of contract may be obtained from the South African Institution of Civil Engineering (Tel: 011-805 5947 and www.saice.org.za).

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

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

VARIATIONS TO THE GENERAL CONDITIONS OF CONTRACT

PART 1 : DATA TO BE PROVIDED BY THE EMPLOYER

REF. CLAUSE NO.	DATA BY EMPLOYER	
1.1.13	**The Defects Liability Period is:**	12 months
1.1.1.15	**The name of the Employer is:**	**DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY**
1.1.1.26	**The Pricing Strategy is:**	Re-measurement
1.2.1.2	**The address of Employer:** Telephone: 017 734 6100 Fax :086 630 2209 Address (physical): DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY, Address (postal): P. Bag X9011, VOLKSRUST, 2470	
1.1.1.16	**Name of Engineer**:	DLV Engineers (Pty) Ltd
1.2.1.2	**Address of Engineer**:	
	Physical:	Postal:
	144 Mark Street	P O Box 1460
	VRYHEID, 3100	VRYHEID, 3100
	Telephone No :034 980 7242 e-mail: simbongile@dlveng.co.za	Fax No: 034 983 2765

REF. CLAUSE NO.	DATA BY EMPLOYER
5.3.1	**The documentation required before commencement with Works execution are:**
	• Initial programme (Refer to Clause 5.6) • Insurance (Refer to Clause 8.6)
5.3.2	**The time to submit the documentation required before commencement with Works execution is:** 14 Days
5.8.1	**Non-working days are:** Sundays
	The special non-working days are: Public holidays and the year-end break which commences on the first working day after 15 December and ends on the first Tuesday after 5 January of the next year.
5.13.1	**The penalty for failing to complete the Works is:** 1.5% of the contract amount per month.
5.13.2	**The penalty for non-compliance during the contract or fraudulent disclosure is:** R500 excluding VAT per calendar day until the contractor becomes compliant.
5.16.3	**The latent defect period is:** 5 years
6.5.1.2.3	**The percentage allowances to cover overhead charges:**
	• 10% of the gross remuneration of workmen and foremen actually engaged in the daywork; and • 10% on the net cost of materials actually used
6.8.2	**Contract Price Adjustment** will not be applicable.
6.10.1.5	**The percentage advance on materials not yet built into the Permanent Works is:** 80% provided a cession in favor of the Employer is provided from both the supplier and the Contractor.
6.10.3	**The limit of retention money is:** 10% of each payment certificate up to a maximum of 5% of the offered total of prices excluding VAT.
6.10.4	**Payment period:** DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY shall pay the amount due to the Contractor within 30 days of approval of the payment certificate, subject to payment being received from Municipality.
8.6.1	**INSURANCE EFFECTED BY THE EMPLOYER** The Employer will not provide any insurance. The Contractor may request that the Contract Works Insurance, SASRIA Special Risks Insurance and Public Liability Insurance be included on the Employer's Insurance Policy. The cost of this insurance will then be for the Contractor's account and will be deducted from money due to the Contractor. The Contractor will also be liable for the cost of any deductibles (first amount payable). **INSURANCE EFFECTED BY THE CONTRACTOR** a) The Contractor and Sub-contractor shall where applicable provide as a minimum the following: i) Contract Works, SASRIA and Public Liability Insurance; ii) Insurance of Construction Plant and Equipment (including tools offices and other temporary structures and contents) and other things (except those intended for incorporation into the Works) brought onto the site for a sum sufficient to provide for their replacement; iii) Insurance in terms of the provisions of the Compensation for Occupational Injuries and Diseases Act (COID) Act No 130 of 1993; iii) Employers Common Law Liability Insurance with a limit of indemnity of not less than R 1 000 000.00; iv) Motor Vehicle Liability Insurance comprising (as a minimum) "balance of Third Party" Risks including Passenger Liability indemnity of not less than R 1 000 000.00 (one

million Rand) ; and

v) Where the Contract involves manufacturing and/or fabrication of the Works or parts thereof at premises other than at the Contract Site the Contractor shall satisfy the Employer that all materials and equipment for incorporation in the Works are adequately insured during manufacture and/or fabrication. In the event of the Employer having an insurable interest in such Works during manufacture or fabrication then such interest shall be noted by the endorsement to the relevant Policies of Insurance.

The Contractor shall within fourteen (14) days of commencement of the contract produce to the Employer the relevant Policies of Insurance.

Notwithstanding anything elsewhere contained in this Contract without limiting the obligations liabilities or responsibilities of the Contractor in any way whatsoever (including but not limited to any requirement for the provision by the Contractor of any other insurances) the Employer may, on behalf of the Contractor, effect and maintain as appropriate in the joint names of the Employer the Contractor and where the relevant Sub-contractors the following insurances which are subject to the terms, limits, exceptions and conditions of the Policy.

CONTRACT WORKS AND SASRIA SPECIAL RISKS INSURANCE – which will provide cover against accidental physical loss or damage to the Works, Temporary Works and materials intended for incorporation in the Works.

PUBLIC LIABILITY Insurance – which will provide indemnity against legal liability in the event of accidental death of or injury to third persons and/or loss of or damage to third party property arising directly from the execution of the contract and occurring during the period of insurance with a limit of indemnity of R5,000,000.00 in respect of all claims arising from any one occurrence or series of occurrences consequent on or attributable to one source or original cause.

The Employer shall pay the premium in connection with the insurance effected by the Employer and recover all costs associated therewith from money due to the Contractor.

Any further clarification of the scope of cover provided by the policies arranged by the Employer should be obtained from the Employer or their Insurance Brokers, Aon South Africa (Pty) Ltd, Telephone (031) 566 6000, e-mail carolrapson@aon.co.za, attention Carol Rapson.

In the event of any occurrence which is likely to or could give rise to a claim under the insurances arranged by the Employer the Contractor shall:-

(i) in addition to any statutory requirement or other requirements contained in the Contract immediately notify the Employer's Insurance Brokers or the Insurers by telephone, telefax giving the circumstances nature and an estimate of the loss or damage or liability;

(ii) complete a claims advice form available from the insurance brokers to whom the form must be returned without delay; and

(iii) negotiate the settlement of claims with the Insurers through the Employer's insurance brokers and shall when required to do so obtain the Employer's approval of such settlement.

The Employer and Insurers shall have the right to make all and any queries on the site of the Works or elsewhere as to the cause and the results of any such occurrence and the Contractor shall co-operate in the carrying out of such enquiries.

The Contractor will be liable for the amount of the deductible (First Amount Payable) in respect of any claim made by or against the Contractor or Sub-contractors under the insurance effected by the Employer.

Any amount which becomes payable to the Contractor or any of his Sub-contractors as a result of a claim under the Contract Works Insurance shall if required by the Employer be paid net of the deductible to the Employer who shall pay the Contractor from the proceeds of such payment upon rectification repair or reinstatement of the loss or damage but this provision shall not in any way affect the Contractor's obligations and liabilities or responsibilities in terms of the Contract.

8.6.1.1.3	R Nil
10.5.3	**The number of Adjudication Board Members to be appointed is:** Nil

PART 2: DATA TO BE PROVIDED BY CONTRACTOR

<table>
<tr><td>REF. CLAUSE No</td><td>DATA BY CONTRACTOR</td></tr>
<tr><td></td><td></td></tr>
<tr><td>1.1.1.9</td><td>Name of Contractor:</td></tr>
<tr><td></td><td></td></tr>
<tr><td>1.2.1.2</td><td>Address of Contractor:</td></tr>
<tr><td></td><td>Physical: ..... Postal: .....</td></tr>
<tr><td></td><td>..... .....</td></tr>
<tr><td></td><td>..... .....</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td>e-mail: ….....

Telephone No: …..... Fax No:….....</td></tr>
<tr><td></td><td></td></tr>
<tr><td>1.1.1.14</td><td>Time for achieving Practical Completion of the whole of the Works is:

_____(Max 10 Months)</td></tr>
<tr><td>6.2.1</td><td>The security to be provided by the Contractor shall be one of the following:

VAT is to be excluded from the Contract Sum/ value of Works for calculating the percentages</td></tr>
<tr><td></td><td>
<table>
<tr><td>Type of Security</td><td>Contractor’s choice
Indicate “Yes” or No”</td></tr>
<tr><td>Cash deposit of 10% of the Contract Sum</td><td></td></tr>
<tr><td>Performance guarantee of 10% of the Contract Sum</td><td></td></tr>
<tr><td>10% Additional retention on every Payment Certificate of the Contractor in lieu of surety</td><td></td></tr>
</table>
</td></tr>
</table>

C1.2.2 AGREEMENT IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT No 85 OF 1993

THIS AGREEMENT is made between .....

(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 authorized 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

CONTRACT NO: APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL SEWER PUMP STATIONS

for the construction, completion and maintenance of the works;

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 authorized 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 this

the …….. day of ……..…… 20……

SIGNATURE: .....

NAME AND SURNAME: .....

CAPACITY: .....

WITNESSES: 1. .....

2. .....

C.2 PRICING DATA

C2.1 PRICING INSTRUCTIONS

1. GENERAL

The Bill of Quantities forms part of the Contract Documents and must be read and priced in conjunction with all the other documents comprising the Contract Documents, which include the Conditions of Tender, Conditions of Contract, the Specifications (including the Project Specification) and the Drawings.

2. DESCRIPTION OF ITEMS IN THE SCHEDULE

The Bill of Quantities has been drawn up generally in accordance with Civil Engineering Quantities 1990 issued by the SA Institution of Civil Engineers.

The short descriptions of the items in the Bill of Quantities are for identification purposes only and the measurement and payment clause of the Standardized Specifications and the Particular Specifications, read together with the relevant clauses of the Project Specification and directives on the drawings, set out what ancillary or associated work and activities are included in the rates for the operations specified.

3. QUANTITIES REFLECTED IN THE SCHEDULE

The quantities given in the Bill of Quantities are estimates only, and subject to re-measuring during the execution of the work. The Contractor shall obtain the Engineer's detailed instructions for all work before ordering any materials or executing work or making arrangements for it.

The Works as finally completed in accordance with the Contract shall be measured and paid for as specified in the Bill of Quantities and in accordance with the General and Special Conditions of Contract, the Specifications and Project Specifications and the Drawings. Unless otherwise stated, items are measured net in accordance with the Drawings, and no allowance has been made for waste.

The validity of the contract will in no way be affected by differences between the quantities in the Bill of Quantities and the quantities finally certified for payment.

4. PROVISIONAL SUMS

Where Provisional sums or Prime Cost sums are provided for items in the Bill of Quantities, payment for the work done under such items will be made in accordance with Clause 6.6 of the General Conditions of Contract 2015. The Employer reserves the right, during the execution of the works, to adjust the stated amounts upwards or downwards according to the work actually done under the item, or the item may be omitted altogether, without affecting the validity of the Contract.

The Tenderer shall not under any circumstances whatsoever delete or amend any of the sums inserted in the "Amount" column of the Bill of Quantities and in the Summary of the Bill of Quantities unless ordered or authorized in writing by the Employer before closure of tenders. Any unauthorized changes made by the Tenderer to provisional items in the schedule, or to the provisional percentages and sums in the Summary of the Bill of Quantities, will be treated as arithmetical errors.

5. PRICING OF THE BILL OF QUANTITIES

The prices and rates to be inserted by the Tenderer in the Bill of Quantities shall be the full inclusive prices to be paid by the Employer for the work described under the several items, and shall include full compensation for all costs and expenses that may be required in and for the completion and maintenance during the defects liability period of all the work described and as shown on the drawings as well as all overheads, profits, incidentals and the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the Tender is based.

Each item shall be priced and extended to the "Total" column by the Tenderer, with the exception of the items for which only rates are required, or items which already have Prime Cost or Provisional Sums affixed thereto. If the Contractor omits to price any items in the Bill of Quantities, then these items will be considered

to have a nil rate or price.

All items for which terminology such as "inclusive" or "not applicable" have been added by the Tenderer will be regarded as having a nil rate which shall be valid irrespective of any change in quantities during the execution of the Contract.

The Tenderer shall fill in rates for all items where the words "rate only" appears in the "Total" column. "Rate Only" items have been included where:

(a) an alternative item or material is contemplated;
(b) variations of specified components in the make-up of a pay item may be expected; and
(c) no work under the item is foreseen at tender stage but the possibility that such work may be required is not excluded.

For “Rate Only” items no quantities are given in the "Quantity" column but the quoted rate shall apply in the event of work under this item being required. The Tenderer shall however note that in terms of the Tender Data the Tenderer may be asked to reconsider any such rates which the Employer may regard as unbalanced.

All rates and amounts quoted in the Bill of Quantities shall be in Rands and cents and shall include all levies and taxes (other than VAT). VAT will be added in the summary of the Bill of Quantities.

6. CORRECTION OF ENTRIES

Incorrect entries shall not be erased or obliterated with correction fluid but must be crossed out neatly. The correct figures must be entered above or adjacent to the deleted entry, and the alteration must be initialed by the Tenderer.

7. ARITHMETICAL ERRORS

Arithmetical errors found in the Bill of Quantities as a result of faulty multiplication of addition, will be corrected by the Engineer at the tender evaluation stage, in accordance with the procedure set out in the Tender Data.

8. MONTHLY PAYMENTS

Unless otherwise specified in the Specifications and Project Specifications, progress payments in Interim Certificates, referred to in Clause 6.10 of the General Conditions of Contract 2015, in respect of "sum" items in the Bill of Quantities shall be by means of interim progress installments assessed by the Engineer and based on the measure in which the work actually carried out relates to the extent of the work to be done by the Contractor.

9. UNITS OF MEASUREMENT

The units of measurement described in the Bill of Quantities are metric units for which the standard international abbreviations are used. Non-standard abbreviations which may appear in the Bill of Quantities are as follows:

No.	=	number	PC sum	=	Prime cost sum
%	=	percent	Prov sum	=	Provisional sum

10. PRODUCT NAMES OR SIMILAR APPROVED

Wherever reference has been made to product names, it also includes all similar DRPKISLM approved product names. Should alternative products be included, all relevant information to be supplied for approval by DRPKISLM.

11. PAYMENT FOR THE LABOUR-INTENSIVE COMPONENT OF THE WORKS:

Those parts of the works to be constructed using labour-intensive methods are marked in the bill of quantities with the letters LI either in a separate column or as a prefix or suffix against every item so designated. The works, or parts of the works so designated are to be constructed using labour-intensive methods only. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a deviation from the contract. The items marked with the letters LI are not necessarily an exhaustive list of all the activities which must be done by hand and this clause does not over-ride any of the requirements in the generic labour-intensive specification in the Scope of Works.

Where minimum labour intensity is specified in the design, the contractor is expected to use their initiative to identify additional activities that can be done labour-intensively in order to comply with the set minimum labour intensity targets.

Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict

12. LINKAGE OF PAYMENT FOR LABOUR-INTENSIVE COMPONENT OF WORKS TO SUBMISSION OF PROJECT DATA

The Contractor's payment invoices shall be accompanied by labour information for the corresponding period in a format specified by the employer. If the contractor chooses to delay submitting payment invoices, labour returns shall still be submitted as per frequency and timeframes stipulated by the Employer. The contractor's invoices shall not be paid until all pending labour information has been submitted. The client may institute a penalty relating to outstanding labour information.

The following information shall be maintained on site and submitted in electronic/hard copy formats:

- Certified ID copies of all locally employed labour
- Signed Contracts between the employer and the EPWP Participants
- Attendance Registers for the EPWP Participants
- Proof of Payment of EPWP Employees
- Monthly Reporting Template as per EPWP requirements

C2.2 BILL OF QUANTITIES

NAME OF CLIENT **DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY**
CONTRACT NUMBER **T14/2026**
PROJECT DESCR. **APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS**

SECTION A : PRELIMINARIES & GENERALS

ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1,1	SABS 1200 A	SECTION 1 : PRELIMINARY AND GENERAL NOTE: A rate or price must be entered in the amount column for each item. Items which are included should have the word 'included' written in the appropriate amount column.				
1,2	8,3	SCHEDULED FIXED-CHARGE AND VALUE RELATED ITEMS				
1.2.1	8.3.1	Contractual Requirements	Sum	1		
	8.3.2	Establishment of Facilities on the Site	Sum	1		
	8.3.2.1	Facilities for Engineer SANS 1200 AB				
1.2.1 (a)	8.3.2.1(a)	Engineers Office	Sum	1		
1.2.2		Nameboards	No	3		
	8.3.2.2	Facilities for Contractor				
1.2.3		a) Offices and storage sheds	Sum	1		
1.2.4		b) Workshops	Sum	1		
1.2.5		c) Laboratories	Sum	1		
1.2.6		d) Living Accommodation	Sum	1		
1.2.7		e) Ablution and latrine facilities	Sum	1		
1.2.8		f) Tools and equipment	Sum	1		
1.2.9		g) Water supplies, electric power and communications	Sum	1		
1.2.10		h) Dealing with water (Subclause 5.5)	Sum	1		
1.2.11		i) Access (Subclause 5.8)	Sum	1		
1.2.12		j) Plant	Sum	1		
1.2.13	8.3.3	Other Fixed-charge Obligations -	Sum	1		
1.2.14		All work to ensure compliance with the provisions of the OHS Act 85 of 1993 and Regulations R1010 as published in Government Gazette on 18 July 2003. This item shall include all costs to provide a safety plan including the monitoring thereof, auditing thereof and the reporting thereon to the Engineer, on a regular basis.	Sum	1		
1.2.15		All work required to be done for Environmental Management. NB. Exclude topsoiling; compaction of earth berms and grassing etc. as these are individually itemised.	Sum	1		
1.2.16	8.3.4	Removal of Site Establishment	Sum	1		
1,3	8,4	SCHEDULED TIME-RELATED ITEMS				
1.3.1	8.4.1	Contractual Requirements	Sum	1		
	8.4.2	Operation and Maintenance of Facilities on Site, for Duration of Construction, except where otherwise stated.				
TOTAL CARRIED FORWARD						

ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
	8.4.2.1	Facilities for Engineer				
1.3.2		Nameboards	No	3		
1.3.2(a)		Engineers Office	Sum	1		
	8.4.2.2	Facilities for Contractor				
1.3.3		a) Offices and storage sheds	Sum	1		
1.3.4		b) Workshops	Sum	1		
1.3.5		c) Laboratories	Sum	1		
1.3.6		d) Living Accommodation	Sum	1		
1.3.7		e) Ablution and latrine facilities	Sum	1		
1.3.8		f) Tools and equipment	Sum	1		
1.3.9		g) Water supplies, electric power and communications	Sum	1		
1.3.10		h) Dealing with water (Subclause 5.5)	Sum	1		
1.3.11		i) Access (Subclause 5.8)	Sum	1		
1.3.12		j) Plant	Sum	1		
1.3.13	8.4.3	Supervision for Duration of Construction	Sum	1		
1.3.14	8.4.4	Company and head office overhead costs for the duration of the contract	Sum	1		
1.3.15	8.4.5	Other time-related obligations	Sum	1		
1.3.16		All work to ensure compliance with the provisions of the OHS Act 85 of 1993 and Regulations R1010 as published in Government Gazette on 18 July 2003. This item shall include all costs to provide a safety plan including the monitoring thereof, auditing thereof and the reporting thereon to the Engineer, on a regular basis.	Sum	1		
1.3.17		All work required to be done for Environmental Management. NB. Include removal of topsoil and exclude compaction of earth berms and grassing etc. as these are individually itemised.	Sum	1		
1,4	8,7	DAYWORK LABOUR Supervision, transport etc. to be included in P&G allowance. Any other allowance to be included in the rate.				
1.4.1		a) Unskilled Labour	hr	4		
1.4.2		b) Semi-skilled Labour	hr	6		
1.4.3		c) Plumber	hr	10		
1.4.4		d) Ganger	hr	2		
1.4.5		e) Flagmen	hr	2		
1.4.6		f) Foreman	hr	2		
TOTAL CARRIED FORWARD						

SECTION A : PRELIMINARIES & GENERALS

ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
1,5		PLANT				
1.5.1		a) Grader (CAT 140G or Similar).	hr	10		
1.5.2		b) Track Excavator (CAT 235 or similar).	hr	10		
1.5.3		c) Vibratory Roller (BOMAG 212 or Similar).	hr	4		
1.5.4		d) Pedestrian Roller(Bomag BW 90 or Similar)	hr	4		
1.5.5		e) Water Truck(5000litres)	hr	10		
1.5.6		f) Dewatering pump including generator and accessories (50mm pump, 600 l/m)	hr	5		
1.5.7		g) Water Truck(5000litres)	hr	6		
1.5.8		h) Tipper Truck(10m³)	hr	4		
1.5.9		i) Backhoe TLB (CAT 428 or equivalent).	hr	10		
1.5.10		j) Dewatering pump including generator and accessories (50mm pump, 600 l/m)	hr	40		
1,6		MATERIAL				
1.6.1		Actual cost of materials delivered to site inclusive of transport charges. (supporting invoices to be supplied)	Prov Sum	1	**4 500,00**	**R4 500,00**
1.6.2		Percentage adjustment on item above for materials	%	4 500		
1,7		COMMUNITY LIAISON OFFICER				
1.7.1		Allowance for CLO reimbursement.	Prov Sum	1	**100 000,00**	**R100 000,00**
1.7.2		Contractor's markup on item above	%	R100 000,00		
1,8		*STUDENT IN-SERVICE TRAINING*				
1.8.1		Allowance for Student in-service Training as provided by Municipality	Prov Sum	1	**85 000,00**	**R85 000,00**
1.8.2		Contractor's markup on item above	%	R85 000,00		
1,9		PROJECT STEERING COMMITTEE (PSC)				
1.9.1		Allowance for PSC disbursements for attendance	Prov Sum	1	**R20 000,00**	**R20 000,00**
1.9.2		Contractor's markup on item above	%	20 000		
1,1		ENVIRONMENTAL CONTROL OFFICER				
1.10.1		Allowance for provision of an Environmental control officer (ECO)	Prov Sum	1	**R85 000,00**	**R85 000,00**
1.10.2		Contractor's markup on item above	%	85 000		
1,11		INSTITUTIONAL & SOCIAL DEVELOPMENT (ISD)				
1.11.1		Allowance for provision of an ISD	Prov Sum	1	**85 000,00**	**R85 000,00**
1.11.2		Contractor's markup on item above	%	85 000		
TOTAL CARRIED FORWARD						

NAME OF CLIENT DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY
CONTRACT NUMBER T14/2026

PROJECT DESCR. APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS

SECTION A : PRELIMINARIES & GENERALS

ITEM NO	PAYMENT CLAUSE	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
1,12		OCCUPATIONAL HEALTH AND SAFETY				
1.12.1		Allowance for provision of an Occupational Health and Safety Officer (OHSO)	Prov Sum	1	**100 000,00**	**R100 000,00**
1.12.2		Contractor's markup on item above	%	100 000		
1.12.3		Allowance for provision of an Occupational Health and Safety Auditor	Prov Sum	1	**50 000,00**	**R50 000,00**
1.12.4		Contractor's markup on item above	%	50 000		
1,13		PROVISIONAL SUM FOR USE OF LDV				
1.13.1		Use of DLV (bakkie) including fuel for average travel of 750km/week for use of Engineer or his representative and Client for the duration of the contract	Prov Sum	1	**80 000,00**	**R80 000,00**
1.13.2		Contractor's markup on item above	%	80 000		
1,14		PROVISION FOR EPWP				
1.14.1		Extra over sub-item for branding of EPWP PPE	Sum	1		
1,15		PROVISION FOR TRAINING				
1.15.1		General Skills Training	Person days of Training	45	**150,00**	**R6 750,00**
1.15.2		Allowance for CEITS skills training of local labour - Accreded certficate	Prov. Sum	1	**5 000,00**	**R5 000,00**
1.15.3		Handling cost and profit in respect of item above	%	5 000		
1.15.4		Training Venue (only if required)	Sum	1		
1.15.5		Transport and accomodation of workers for training where it is not possible to undertake the training in close proximity to the site. (provisional sum)	Prov Sum	1	**5 000,00**	**R5 000,00**
1.15.6		Handling cost and profit in respect of item above	%	5 000		
1.17	8,5	TESTING AND AS BUILT SURVEY				
1.17.1		Allowance for Testing and As built Survey at the sole discretion of the Engineer or Client	Prov Sum	1	**50 000,00**	**R50 000,00**
TOTAL CARRIED FORWARD TO SUMMARY						

NAME OF CLIENT DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY
CONTRACT NUMBER T14/2026
PROJECT DESCR. APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS

SECTION B1 HOOF PUMP STATION EXTERNAL WORKS

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
2		**HOOF PUMP STATION EXTERNAL WORKS**				
2.1		**EXCAVATIONS**				
2.1.1		Excavations for Posts	m3	8		
2.2		**CONCRETE**				
2.2.1		15 Mpa Concrete Footings/Bases: Cast Concrete bases (400 x 400 x 750mm) - Top of concrete base to be 50mm above ground level	m3	8		
2.3		**FENCE WORKS**				
		GALVANIZED CLEARVU SECURITY BARRIER FENCING SYSTEMS				
		"Cochrane ClearVu" galvanised "Marine Fusion Bond" coated taper locking posts set in exact position in concrete, including UV stabilized polymer cap (excavation and concrete base elsewhere measured)				
2.3.1		3000mm Long 85 x 45 x 85mm post including Locking Recess Mechanism	m	5	800,00	4 000,00
2.3.1		Security fence 2.4m high of 3297mm wide x 2400mm high panels, formed with 3mm diameter wired mesh with aperture size 76.2 x 12.7mm, each panel reinforced with four 50mm deep 'V' formation horizontal recessed bands, two 70 degree flanges along both sides and two 30 degree flanges along top and toe.	m	5	3 000,00	15 000,00
2.3.3		Sliding motor vehicle gate 5000 x 2400mm high overall, formed with 75 x 75 x 2mm thick hollow section gate surround with 45 x 45 x 3mm angle section guide rail and two 100 x 50 x 2mm thick hollow section vertical intermediate rails to form three gate panels, gate panels filled in with three standard flat "Cochrane ClearVu" panels without "V" formation and secured to gate frame and intermediate rails with 50 x 5mm flat section "Securifor Fixators" sub-frames and M8 counter sunk stainless steel hex-screws with dome nuts at 381mm centres, floor track of 10.0m IPE 100 I-section and 20mm diameter solid steel rod welded together and casted into concrete groundbeam, two pairs of heavy duty rollers fitted to the underside of the gate, all as per attached drawings (concrete and guide posts elsewhere measured)	No	1	50 000,00	50 000,00
TOTAL CARRIED FORWARD						

NAME OF CLIENT DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY
CONTRACT NUMBER T14/2026
PROJECT DESCR. APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS

SECTION B1 HOOF PUMP STATION EXTERNAL WORKS

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
					TOTAL CARRIED FORWARD	
2.4		**HOOF PUMP STATION - INLET CHANNEL**				
		Cleaning and dispose of old dirt/sludge within sumps & grit and other rubble within sumps: For depth total depth trench:				
2.4.1		a) desludging by means of honey sucker	sum	1		
2.4.2		b) Cleaning & clearing of the grit channel	sum	1		
2.4.3		c) Testing of the exisiting pipe works	sum	1		
2.5		**EQUIPMENT AT INLET WORKS**				
2.5.1		Handrake inlet screen with 2 x custom made handrakes, complete with foot plate, top of canal wall fixing plates and bolts & nuts - All SS 304L	No	1		
2.5.2		600 mm Wide SS 304L drip tray for screenings	No	1		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
					TOTAL CARRIED FORWARD	
2.6		**REFURBISHMENT OF EXISTING ABLUTION AND SHOWER**				
		Site Clearance				
2.4.1		Clear and grub inside builing and perimeter (where not cleared within other clear and grub areas)	m²	7		
2.4.2		Concrete Finishing of sufraces with steel float				
2.4.3		Interior Walls	m²	21		
2.5		Exterior Walls	m²	26		
2.5.1		Surface floor slab (screed)	m²	5		
2.5.2	**SABS 1200HB**	One layer of 250 micron Gunplas USB Green or similar approved waterproof sheeting sealed at laps with Gunplas Pressure Sensitive Tape: Under concrete surface beds	m²	5		
2.6		**CARPENRTY AND JOINERY**				
		Engineer Certified, designed and analysed, pre-fabricated roof construction. Plate nailed timber roof truss construction, formed of CCA treated sawn softwood, with patented galvanised plate nailed connections, fixed in position:				
		Roof construction to Gable roof according to detail drawings, including all trusses, TECO Products or similar approved , Bracing & Runners. (wall plates & purlins elsewhere).				
2.6.1		38 x 114mm Wall plate	m	11		
2.6.2		114 x 38 mm rafters spaed at max 600 cc	m	11		
2.6.3		38 x 76m Purlins including fixing to trusses using hurricane clips.	m	11		
2.6.4		Tilter batten planed from 50 x 75mm Purlin including fixing to trusses using hurricane clips.	m	11		
		Fascias, bargeboards and other fibre cement products.				
2.6.5		80x225mm Tempered bargeboard, including fixing to roof gable end.	m	6		
2.6.6		225x15mm Tempered fascia, fixed to tilter batten.	m	5		
2.7		**CEILINGS**				
2.7.1		4mm Nutec or similar approved ceiling board, fixed to 38x38mm battens at max. 400mm c/c. Rate to include battens.	m²	5		
2.7.2		Extra over ceiling and brandering for 600 x 600mm trap door and frame and H-profile grid fitted flush in opening including any additional brandering	no	1		
2.7.3		75mm Coved Nu-cornice or similar approved applied to manufacturer's specifications.	m	9		
2.8		**DOORS**				
2.8.1		Solid Meranti FL doors: 40x813x2032mm high door hung to steel frame, including Solid Blesbok 460/312/E41or similar approved 3-lever lockset.(Door - D2)	no	1		
2.9		**TILLING**				
		Tiling Prepare floor surfaces and lay floor tile in accordance with suppliers specification. 400 x 400mm Johnson or similar approved ceramic tiles fixed with adhesive and with 8mm joints in both directions and flush pointed with tinted waterproof jointing compound and sealed as per manufacturer's specifications (colour to be confirmed by client or client's agent)				
2.9.1		on floor	m²	5		
2.9.2		Shower Walls	m²	15		
TOTAL CARRIED FORWARD						

NAME OF CLIENT DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY
CONTRACT NUMBER T14/2026
PROJECT DESCR. APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS
SECTION B1 HOOF PUMP STATION EXTERNAL WORKS

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
					TOTAL CARRIED FORWARD	
2.10		**METALWORK**				
		Alluminium window units as per approved system, complete with subframes, ironmongery, glass, sealing, etc and fixing to brickwork or concrete				
2.10.1		Approximately 1500 x 1200 Aluminium winodw 26mm Case Brz ptt1512	no	1		
2.10.2		Aluminum window value range bronze obscure glass top hung PT66 1 vent W600MM x H600MM	no	1		
2.11		**ROOF COVERINGS**				
	SABS 1200HB	0.6mm 'Chromadek' IBR or similar approved roof sheeting and accessories, fixed to timber purlins with 'Posidrive' or similar approved roof screws in accordance with the manufacturer's specifications:				
2.11.1		0.6mm Aloe Green' IBR roof sheeting with 15deg.	m²	8		
2.11.2		Roof and wall insulation. 'Sisalation 405 Multi Purpose' or similar approved insulation, suspended on 2mm galvanised wires, fixed to purlins @ 300mm c/c:	m²	8		
2.11.3		Alluminium ogee gutter	m	6		
2.12		**PLUMBING**				
2.12.1		Complete installation of gravity sewer from refurbished guardhouse to existing inlet manhole to Hoof Pump station. Rate to including the removal of existing paving, trenching, bedding, 160mm uPVC class 34 (10m), backfilling, repair of paving to original condition as well as connecting to existing inlet works.	Sum	1		
		Replacement of the following items relating to plumbing.				
2.12.2		Water Closet (WC) Pans Glazed Ceramic (SANS 497)	No	1		
2.12.3		Ceramic Flushing Unit (SANS 1509)	No	1		
2.12.4		Hand Wash Basin (complete unit with mixer taps included (Metallic SANS 226)	sum	1		
2.12.5		a) Cistern-pan connection (Flush pipe)	No.	1		
2.12.6		b) Flexible cistern tank supply connection 20X20mm pipe.	No.	1		
2.12.7		c) Rubber cone for flush pipe (black)	No.	1		
2.12.8		Repair of toilet outflow pipework.	sum	1		
2.12.9		15mm Shower mixer (Metallic SANS 226)	No	1		
2.12.10		Shower head fitting	No	1		
2.12.11		HDPE compression fittings as per SANS 14236	No.	1		
2.12.12		High Density Polyethylene Pipes SANS ISO 4427 Class PN16,PE100,SD11)	m	10		
2.12.13		15mm Ball Valve (Metallic SANS 1056-3)	No.	3		
2.13		**ELECRICAL WORKS** Electrical installation certified by a registered Electrician. All of the following items are to include for all supply, chasing, conduiting, draw wires, wiring, installation and testing, including DB				
2.13.1		Main electrical supply to the guardhouse	m	25		
2.13.2		Ceiling light point.	No	3		
2.13.3		Light switch - 2 lever	No	2		
2.13.4		Light fittings - Supply and fit: Exterior wall light - 'Beka' 31007 BULKHEAD LED7 LED 7/2.4W – 1142 or similar approved LED Bulkhead with metal body and cover.	No	1		
TOTAL CARRIED FORWARD						

SECTION B2: PUMPSTATION CIVIL & STRUCTURAL

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3		**SECTION B2: PUMPSTATION CIVIL & STRUCTURAL**				
3.1	**SABS 1200C**	**CLEAR AND GRUB**				
	8.2.1	Clear and grub				
3.1.1		Clear and grub including removal of trees and stumps of girth got sewer pumpstation platform and access road	m^2	180		
3.2	**SABS 1200C**	**SITE CLEARANCE**				
3.2.1	**8.3.1**	Removal topsoil to nominal 150mm, stockpile and maintain	m^2	180		
3.2.2	**8.3.1**	Excavate in all materials and use for embankment or backfill and dispose for platform and access road	m^2	180		
3.3	**SABS 1200D**	**BULK EXCAVATION**				
3.3.1	**8.3.2**	a) Bulk excavation in all materials cut to fill and/or spoill and place in embankment and compact to 90% AASHTO	m^3	90		
3.3.2		Extra-over item 4.3.1 for Internedaite excavation in	m^3	54		
3.3.3	**8.3.1**	E.O. for hard rock excavation (Pneumatic or other)	m^3	36		
3.4	**8.3.2 a)**	**RESTRICTED EXCAVATION**				
		Excavate in all materials and backfill or embankment for pump station and emergency storage tank **N.B. These excavations require lateral support and shoring**				
3.4.1		a) Pump Sump	m^3	0		
3.4.2		b) Valve Chamber	m^3	0		
3.4.3		c) Grit chamber	m^3	0		
3.4.4		d) Sand Trap	m^3	0		
3.4.5		e) Pumphouse	m^3	65,2		
	8.3.2 2)	Extra Over Items above				
3.4.6		1) Intermediate	m^3	7		
3.4.7		2) Boulder Class A	m^3	2		
CARRIED FORWARD						

SECTION B2: PUMPSTATION CIVIL & STRUCTURAL

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
					BROUGHT FORWARD	
3.4.8		3) Hard rock (Control Blasting)	m^3	6		
3.4.9		4) Hard rock (Pneumatic or other)	m^3	4		
3.4.10	8.3.2(c)	Excavate and dispose of unsuitable material from trench bottom (Provisional)	m^3	6		
3.4.11		Construct cut-off ditch/berm above pump station as per instruction by Engineer as per detail.	m	80		
3.5		**FINISHINGS**				
3.5.1	**8.3.6**	Topsoil to thickness of 100mm	m^2	360		
3.5.2	**8.3.7**	Re-grass embankment to pump station and access road	m^2	360		
3.6		**MISCELLANEOUS**				
3.6.1		Soil poison surface pump station platform and access road sprayed with “Round Up” or similar approved to prevent vegetation overgrowing the site in accordance with supplier’s coverage.	Sum	1		
3.7	**PBA**	**PUMPSTATION BUILDING**				
3.7.1		Excavate in all materials and backfill or embankment for pump station	m^3	33		
3.8		**CONCRETE**				
		Strength concrete Grade 15/25 for:				
3.8.1	**8.4.3**	Footing	m^3	0		
3.8.2	**8.4.3**	Surface bed	m^3	0		
3.8.3		Roof slab	m^3	0		
3.9		**BRICKWORK**				
3.9.1	**PBA - 4.1**	Brickwall, 230 mm thick wall, clay facebrick in class 1 mortar "Corobrick Fire Light Satin" or similar approved (include hot dipped galvanised wall ties)	m2	63		
CARRIED FORWARD						

SECTION B2: PUMPSTATION CIVIL & STRUCTURAL

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
					BROUGHT FORWARD	
3.9.2		SABS brick reinforcement built in horizontally every third course	m	333		
3.9.3		Brick on edge header course over door and window openings	m	5,5		
	PBA - 4.12	Air bricks				
3.9.4		230 x 152 clay vermin proof built in	No	4		
3.9.5	PBA - 4.3	Pre-cast concrete lintels above doors and windows built in 230 wide x 100mm thick x 2100 mm long	No	1		
3.9.6		Pre-cast concrete lintels above doors and windows built in 230 wide x 100mm thick x 1200mm long	No	2		
3.9.7	PBA - 4.1	Fibre cement window sills 110 x 10 mm to in side face of windows.	Sum	2		
3.10	PBA 4.17	**WATERPROOFING**				
3.10.1		One layer of 375 micron damp proof course 230mm wide in walls	m	21		
3.10.2		250 micron USB Green Water proof sheeting under surface beds	m²	23		
3.11	PB 12	**METALWORK**				
3.11.1		D.V. steel door frame and double transformer steel door, 1600W x 2200 H fully louvred Type YV, complete with suitable 3 lever lockset built into walls with galvanised vermin proof mesh on the inside	No	1		
3.11.2		Extra over for purpose made opening 150 x 100mm to permit removal of pumps by use of gantry, including locking device as shown on the drawings	No	1		
3.12		**WINDOWS**				
3.12.1		Supply and build in Industrial windows type ALU, 950W x 800H mm with pressed steel louvres and galvanised vermin proof mesh on the inside	No	2		
CARRIED FORWARD						

SECTION B2: PUMPSTATION CIVIL & STRUCTURAL

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
3.13		**FLOOR FINISH**				
3.13.1		Supply and apply slip resistant industrial epoxy cement self-smoothing composite floor as per manuafactures specification and engineer approval.	m2	23		
3.14		**BUILDING MISCELLANEOUS**				
3.14.1		Provision for furniture	Prov. Sum	1	25 000,00	25 000,00
	SABS 1200 GA	**CONCRETE (SMALL WORKS)**				
		PUMP STATION & ANCILLARIES				
3.15		**Formwork**				
	8.2.1	Rough				
		Vertical unexposed undergound				
3.15.1		a) Pump Station Footing	m^2	28		
3.15.2		b) Valve Chamber	m^2	0		
3.15.3		c) Sand Trap	m^2	0		
	8.2.2	Smooth				
3.15.4		a) Pump Station Footing	m^2	-		
3.15.5		b) Pump Plinth	m^2	2		
3.15.6		c) Sand Trap	m^2	0		
3.15.7		d) Pump house Roof slab	m^2	44		
CARRIED FORWARD						

SECTION B2: PUMPSTATION CIVIL & STRUCTURAL

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
	8.2.3	Narrow widths				
		Rough, not exceed 350mm for;				
3.15.8		a) Pump Sump	m^2	0		
3.15.9		b) Valve Chamber	m^2	0		
3.15.10		c) Sand Trap	m^2	0		
		Rough, not exceed 250mm for;				
3.15.11		a) Pump Station Footing	m^2	3		
3.15.12		b) Valve Chamber	m^2	0		
3.15.13		c) Sand Trap	m^2	0		
		Smooth, not exceeding 250mm for:				
3.15.14		a) Pump Sump	m^2	0		
3.15.15		b) Valve Chamber	m^2	0		
3.15.16		c) Sand Trap	m^2	0		
3.15.17		d) Roof slab	m^2	3		
		Smooth internal float base kicker not exceeding 100mm depth for:				
3.15.18		a) Pump Sump	m^2	0		
3.15.19		b) Valve Chamber	m^2	0		
3.15.20		c) Sand Trap	m^2	0		
		Rough external for:				
3.15.21		a) Pump Sump	m^2	0		
3.15.22		b) Valve Chamber	m^2	0		
3.15.23		c) Sand Trap	m^2	0		
CARRIED FORWARD						

SECTION B2: PUMPSTATION CIVIL & STRUCTURAL

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
					BROUGHT FORWARD	
	8.2.4	Box out holes/form voids or cast in for pipework, manholes etc.				
		Large, other than circular, of areas over 0.1m^2 and to and including 0.5m^2				
3.15.24		a) Pump House Surface Slab	No.	5		
3.15.25		b) Pump house roof slabs	No.	5		
3.16	8.1.2	**REINFORCEMENT**				
		Mild steel bars				
3.16.1		a) Footings	kg	78		
3.16.2		b) Pump station surface bed	kg	82		
3.16.3		c) Pump station roof slab	kg	156		
		High-tensile steel bars				
3.16.4		a) Footings	kg	442		
3.16.5		b) Pump station surface bed	kg	462		
3.16.6		c) Pump station roof slab	kg	883		
3.17	8.4	**CONCRETE**				
3.17.1		Stone mat (up to 300mm thick, 19mm aggregate, wrapped in Bidim A4 for drainage under structure. Installed where instructed by Engineer)	m^2	29		
	8.4.2	50mm depth of blinding layer in 15/20 concrete to:				
3.17.2		a) Footings	m^3	7		
3.17.3		b) Surface Bed	m^3	23		
3.17.4		c) Sand Trap	m^3	0		
	8.4.3	Strength concrete Grade 30/19 watertight concrete to				
3.17.5		a) Concrete Footings	m^3	5		
3.17.6		b) Pump station surface slab	m^3	5		
3.17.7		c) Sand Trap	m^3	0		
3.17.8		d) Pumphouse roof slab	m^3	9		
CARRIED FORWARD						

SECTION B2: PUMPSTATION CIVIL & STRUCTURAL

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
					BROUGHT FORWARD	
	8.4.3	Strength concrete Grade 15/19 for encasing pipes				
3.17.9		a) Pump Sump	m^3	3		
3.17.10		b) Pump Station walls (Suction and outlet pipework)	m^3	5		
	8.4.4	Unformed surface finishes Wood floated finish as specified to:				
3.17.11		Steel floated finish to floor of pumpstation and roof slab	m^2	65		
3.18	8.5	**JOINTS**				
3.18.1		a) Concrete Footings	m	22		
3.18.2		b) Pump station surface slab	m	20		
3.18.3		c) Pumphouse roof slab	m	27		
CARRIED FORWARD						

SECTION B2: PUMPSTATION CIVIL & STRUCTURAL

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
					BROUGHT FORWARD	
3.19		**MISCELLANEOUS**				
3.19.1		Supply and install 152mm x 152mm mild Universal Column SANS 50025/EN 10025 Grade S355JR with solid plates end at each end to measure on site, hot galvanized, to support valves in Pump station, as per detail	No.	2		
3.19.2		Construct 30/19 concrete thrust blocks, complete in pump station as per details.	No.	4		
3.19.3		Supply and install the GMS vent pipe for sump as per detail.	No.	2		
3.20	**PSHA 4.1**	Mobile Gantry				
3.20.1	**PSHA 4.1 & PSHA 4.2**	Mild steel gantry and crawler beam suited to accommodate beam, all inclusive	Sum	1		
3.20.3		Supply and install stainless ladder, as per details.	Sum	1		
3.20.4		safety signage to the requirements of the national building regulations SANS 10400.	Sum	1		
TOTAL CARRIED TO SUMMARY						

NAME OF CLIENT **DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY**
CONTRACT NO. **T14/2026**
PROJECT DESCR. **APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS**
SECTION B3: HOOF SEWER PUMP STATION - MECHANICAL WORK

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4.1		**SECTION B3 : HOOF SEWER PUMP STATION - MECHANICAL WORK** **Note : All pump pipework, valves, fittings and associated equipment are measured elsewhere under the civil works** **Design , supply , manufacture , deliver , offload , install , connect up, test and commission, guarantee and maintaing the pumping plant and associated equipment to LOCAL MUNICIPALITY STANDARDS and to the relevant SANS, BS or other recognised codes and standards**				
4.1.1		Design, manufacture , supply and deliver the following new sewer pump sets for the new pump stations for Hoof Pump Station 1				
4.1.2		a) Hoof Pump Station 1 - Sewage self priming pump supplied by API Pumps type Cornell Model 85TL-F-22 vane - 76mm solids duty 78l/s @ 20,4m head with 30kW IE4 WEG motor , air release, frame/base plate ,pulleys, belts, guards, all sensors etc complete as specified (1 duty and 1 stand-by) - refer to specifications for duty as specified	No	2		
4.1.3		c) Hoof Sewer Pump Station 1 - Supply and install the HDG steel suction pipe with bellmouth etc . Suction pipe from the wet well sump to the suction of the pump - Length and size to be determined by pump supplier , Refer pump station drawings	No	2		rate only
Total Carried Forward						

	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Brought Forward						
4.1.4		Install and connect up of the new pump sets supplied above as follows :				
4.1.5		a) Hoof Sewage pumps for Pump Station 1	No	2		
4.1.6		Align all the pumps and provide certification	No	2		
		Supply, install and connect up the following ancilliary equipment :				
4.1.7		a) Wika or similar pressure gauges 0 - 500kPA complete with piping, backing board etc	No	1		
4.1.8		b) Wika or similar pressure gauges 0 - 1000kPA complete with piping, backing board etc	No	2		
4.1.9		c) ½" BSP sockets with stop-cocks welded on steel pipework for pressure gauges , flow switches etc	No	4		
		SAT - Site test and commission the following pump sets supplied above :				
4.1.10		a) Hoof Sewage pumps for Pump Station 1	Sum	1		
		Assist with testing of the pumping systems and rising mains for the following :				
4.1.11		a) Hoof Sewage pumps for Pump Station 1	Sum	1		
Total Carried Forward						

SECTION B3 : HOOF SEWER PUMP STATION - MECHANICAL WORK

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Brought Forward						
4.2		**PIPEWORK**				
4.2.1		(Item 1) 300mm Ø x 45° Long Segmented Bend, both ends flanged to SABS 1123-1600/3	No	5		
4.2.2		(Item 2) 300mm Swing Check Valve with Counter Weight PN16 (Non- Return Valve-Flanged both ends to SABS 1123-2500/3	No	2		
4.2.3		(Item 3)300mm Ø Industrial Pattern Wedge Gate Valve PN10 - SANS 664 (Non Rising Spindle)	No	2		
4.2.4		(Item 4) 200mm Flexible Connector		2		
4.2.5		(Item 5) 300mm/200mm Diameter Steel Reducer All Ends Flanged to SANS 1123 1600/3	No	2		
4.2.6		(Item 6) Sewage Self Priming Pump, Cornell Model 85TLF-22 Vane - 70mm Solids Duty 78 l/s @ 20.4m Head	No	2		
4.2.7		(Item 7)Pressure Gauge	No	2		
4.2.8		(Item 8) 300mm Steel Y-piece, 45° branch, ends flanged to SANS 1123 / SABS 1600, fabricated from mild steel, epoxy coated, PN16	No	1		
4.2.9		(Item 9) 300mm Ø Steel Pipe flanged both ends to SANS 1123 / SABS 1600	m	11		
4.2.10		(Item 10) 300mm Ø Suction Steel Pipe, flanged on one end and bellmouth on other end, fabricated from mild steel, epoxy coated	m	4		
Total Carried Forward						

NAME OF CLIENT DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

CONTRACT NO. T14/2026

PROJECT DESCR. APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS

SECTION B3 : HOOF SEWER PUMP STATION - MECHANICAL WORK

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Brought Forward						
4.3		**GRINDER**				
4.3.1		Design , manufacture, supply and deliver the API Pumps - JWC 30K Monster Series In-Channel Grinders Model 30005-0024 with control panel	Sum	1		rate only
4.3.2		Install and connect up the Grinder and control panel as specified supplied above	Sum	1		rate only
4.3.3		Test and commission the Grinder and control panel complete as specified (supplier to be in attendance on site)	Sum	1		rate only
4.3.4		Allow an amount for the Supplier & Engineer to attend the FAT for the pumps & motors (factory acceptance tests) at the pump manufacturer's facilities. To include all flights, travel, transfers, accommodations, meals, entertainment, car hire and travel etc complete	Sum	1		rate only
4.3.5		Allow an amount of R 65 000,00 for the Engineers cost to attend the FAT and SAT for the pumps & motors and grinders and for all travel costs to site (	Sum	1		rate only
4.3.6		Allow for profit and attendance on above item 11.15	%	10		rate only
4.3.7		Design , select and submit technical specfications and detailed dimensioned drawings for all the pump sets and grinders including pipework etc supplied above Design and submit layout drawings of the pump sets and pipework & valve details and layout drawings for each of the pump stations as follows :	Sum	1		rate only
4.3.8		a) Hoof Sewage pumps for Pump Station 1	Sum	1		
4.3.9		Prepare and submit test and commissioning data sheets for all the above pump station for all pumps and grinders etc complete	Sum	1		
4.3.10		Submit the O & M manuals for all the above pump stations for pumps and grinders etc as specified	Sum	1		
Total Carried Forward						

NAME OF CLIENT **DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY**
CONTRACT NO. **T14/2026**
PROJECT DESCR. **APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS**
SECTION B3: HOOF SEWER PUMP STATION - MECHANICAL WORK

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Brought Forward						
4.4		**MISCELLANEOUS**				
4.4.1		Provide training for the Client's operations and maintenance staff for the entire pumping and grinder system for the above pump station	Sum	1		
4.4.2		Allow for all labels and signs for all pumps , grinders etc for the above pump station	Sum	1		
4.4.3		Allow a provisional sum of R 50 000,00 for any unforseen work the amounts of which are to be used entirely at the discretion of the Engineer and Client	P Sum	1	50 000,00	50 000,00
4.4.4		Allow for profit and attendance on provisional sum above 11.23	%	50000		
4.4.5		Provide the O & M manuals in comprehensive format as specified for all the above pump stations (5 hard and 5 soft copies)	Sum	1		
4.4.6		Any other items the tenderer considers has been omitted and which requires separate pricing as follows : a) b)				
5,5		STAND-BY GENERATOR INSTALLATION HOOF PUMP STATIONS				
5.5.1		Allow an amount for all Preliminary and General costs (P & Gs) for the generator installation complete	Sum	1		
Total Carried Forward						

SECTION B3 : HOOF SEWER PUMP STATION - MECHANICAL WORK

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Brought Forward						
5.5.2		Design , manufacture and supply the new stand-by diesel generator and control panel with canopy and controls complete as specified for Beta Metal Pump Stations	Sum	1		
5.5.3		Design , manufacture and supply the stand-by diesel generator and control panel with canopy and controls complete as specified for Hoof Pump Station.	Sum	1		
5.5.4		Deliver to site and offload the generator and associated equipment	No	2		
5.5.5		Rig into position and install the complete generator equipmemt	No	2		
5.5.6		Supply full tanks of fuel for testing and commissioning for Hoof and Beta Metal	Sum	1		
5.5.7		Supply and install all mandatory and statutory signage and notices for the 3 gen-sets	Sum	1		
5.5.8		Supply and install cable joints - 35mm² x 4 Core ECC cable	No	2		
5.5.9		Supply and install 50mm²x 4C PVC/ECC/SWA/PVC cable to SANS1507	m	120		
5.5.10		Supply cable glands including shrouds, lugs etc complete for the above cable	No	6		
5.5.11		Allow for the FAT of the all the 3 x generator sets including all costs for Engineer to attend	Sum	1		
5.5.12		Allow an amount of R 35 000,00 for the Engineer to attend the FAT at the gen-set manufacturer's premises and for the site SAT (this amount to be paid directly to Engineer)	Prov. Sum	1	**35 000,00**	**35 000,00**
Total Carried Forward						

NAME OF CLIENT **DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY**

CONTRACT NO. **T14/2026**

PROJECT DESCR. **APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS**

SECTION B3 : HOOF SEWER PUMP STATION - MECHANICAL WORK

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Brought Forward						
5.5.13		Allow for profit and attendance on item above 10.13	%	35 000		
5.5.14		Test and commission the entire generator installation complete for all 3 sites (3 gen-sets)	Sum	1		
5.5.15		Issue of the mandatory generator compliance and other certificates for all 3 x gen-sets	Sum	1		
Total for PS Mechanical Items Forward To Summary						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
		SECTION B4 : ELECTRICAL AND INSTRUMENTATION INSTALLATION Design where required , supply all materials, plant etc. manufacture, deliver to site, draw ex stores, supply scaffolding and all supporting material, install, test and commission, guarantee and maintain the plant for 12 months and submit operating / maintenance manuals for the electrical installation in the following areas all to SANS 10142 , and the Local Authority requirement and approval and as specified and shown on drawings where available **(all items are re-measurable)** Supply , install , test and commission the following:				
5.1		**ELECTRICAL INSTALLATION - HOOF PUMP STATION** MOTOR CONTROL PANELS & DBs				
5.1.1		Design, manufacture , supply and deliver the 400V MCC01 for Hoof Pump Station 1 as specified (including all 30kW & 4kW VSDs /soft starters for pumps/grinder etc complete as specified)	Sum	1		
5.1.2		Install and connect up the MCC01 supplied above	Sum	1		
5.1.3		Allow for the FAT & SAT of the MCC for MCC01 as specified	Sum	1		
5.1.4		Supply and install the 24V DC power supply in the MCC01 as specified	Sum	1		
5.1.5		Supply and install the low level floats with s/s chain and weights in the sewer suction sumps/s or wet well for the low level cut-out controls of the pumps	Set	1		
5.1.6		Supply and install the electronic IFM flow switch for no-flow protection for pumps as specified (suitable for raw sewage)	No	2		
Total Carried Forward						

SECTION B4 : ELECTRICAL AND INSTRUMENTATION INSTALLATION

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
Brought Forward						
5.1.7		Supply and install new LV distribution boards as follows :				
		a) Pump Station DB - 01 (surface)	Sum	1		
5.1.8		c) Guard House DB-02 (surface wearterproof)	Sum	1		
5.2		**TELEMETRY**				
		Allow a provisional sum for Remote Montoring & Control (RMC) telemetry system for the following sites as specified . To include radio survey & OTPC co-ordinates etc :				
5.2.1		a) Pump Station 1	Prov. Sum			Rate only
5.2.2		Allow for profit and attendance on above item 2.1.9.1		%		Rate only
5.2.3		Supply and install the IFM pressure sensors as specified (for rate only)	No	1		Rate Only
5.2.4		Supply and install emergency weatherproof stop locks with stands adjacent the Self Priming Pumps on HDG bracket stands	No	2		
5.3		**CONDUITS , TRUNKING , BOXES ETC**				
5.3.1		20 dia 2 and 3 way galvanised and PVC round boxes with covers	No	15		
5.3.2		Galvanised 100 x 50 x 50 boxes and covers	No	12		
5.3.3		20 and 25 dia galvanised or PVC conduits fixed surface including bends, couplers , saddles etc	m	20		
5.3.4		Supply and install 250-300Amp TP 3 phase CB in existing MCC (include for droppers from busbars and all connections and terminations)	No	1		Rate Only
5.4		**WIRING & ACCESSORIES**				
5.4.1		PVC insulated copper wires with stranded conductors drawn into conduits , wireways etc				
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
Brought Forward						
5.4.2		1.5mm square	m	100		
5.4.3		2.5mm square	m	65		
5.4.4		4mm square	m	45		
5.5		**SOCKETS , SWITCHES AND ACCESSORIES**				
5.5.1		15 amp 3 pin industrial profile switch socket outlets with covers surface	No	4		
5.5.2		15 amp 3 pin switch socket outlet with covers surface	No	4		
5.5.3		15 amp 1 and 2 lever light switch with cover surface	No	2		
5.5.4		32 amp 5 pin WACO or similar industrial welding socket	No	1		
5.5.5		15 amp surface weatherproof 1 lever light switch with cover outdoor type	No	1		
5.5.6		10 amp TP three phase industrial type isolators front entry cord grip for extract fan supply	No	1		
5.5.7		10 amp DP industrial type isolators from entry cord grip for extract fan supply	No	1		
5.5.8		Photo cell	No	1		
		Supply and install the following uPVC cable sleeves (this item may not be required if provided by civil contractor) :				
5.5.9		a). 75 diameter	m	8		
5.5.10		b) 150 diameter	m	8		
5.6		**CABLES & ACCESSORIES**				
		Supply the following cables to SABS 1507 as amended as follows:				
5.6.1		1.5 mm square 2 core PVC/SWA/PVC/ECC	m	30		
5.6.2		1.5 mm square 3 core PVC/SWA/PVC/ECC	m	15		
5.6.3		1.5 mm square 4 core PVC/SWA/PVC/ECC	m	10		
5.6.4		10mm square 2 core PVC/SWA/PVC/ECC	m	5		
5.6.5		10mm square 3 core PVC/SWA/PVC/ECC	m	15		
5.6.6		16mm square 3 core PVC/SWA/PVC/ECC	m	15		
5.6.7		25mm square 4 core PVC/SWA/PVC/ECC	m	20		
5.6.8		35mm square 4 core PVC/SWA/PVC/ECC	m	100		
		Install the cables supplied above in trenches , sleeves , trunking , cable ladders etc as follows :				
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
Brought Forward						
5.6.9		1.5 mm square 2 core PVC/SWA/PVC/ECC	m	30		
5.6.10		1.5 mm square 3 core PVC/SWA/PVC/ECC	m	15		
5.6.11		1.5 mm square 4 core PVC/SWA/PVC/ECC	m	5		
5.6.12		10mm square 2 core PVC/SWA/PVC/ECC	m	15		
5.6.13		10mm square 3 & 4 core PVC/SWA/PVC/ECC	m	15		
5.6.14		16mm square 3 core PVC/SWA/PVC/ECC	m	15		
5.6.15		25mm square 4 core PVC/SWA/PVC/ECC	m	20		
5.6.16		35mm square 4 core PVC/SWA/PVC/ECC	m	100		
		Make off and terminate cables including glands , shrouds , lugs , cable tags etc complete				
5.6.17		1.5 mm square 2 core PVC/SWA/PVC/ECC	No	8		
5.6.18		1.5 mm square 3 core PVC/SWA/PVC/ECC	No	8		
5.6.19		1.5 mm square 4 core PVC/SWA/PVC/ECC	No	4		
5.6.20		10mm square 2 core PVC/SWA/PVC/ECC	No	2		
5.6.21		10mm square 3 & 4 core PVC/SWA/PVC/ECC	No	4		
5.6.22		16mm square 3 core PVC/SWA/PVC/ECC	No	4		
5.6.23		25mm square 4 core PVC/SWA/PVC/ECC	No	2		
5.6.24		35mm square 4 core PVC/SWA/PVC/ECC	No	2		
5.6.25		Install free issue pump power cables in sleeves or on cale tray to junction box (rate only)	Sum	1		
5.6.26		Install free issue pump sensor and instrumentation cable in sleeves (rate only)	Sum	1		
5.6.27		CCG waterproof termination boxes with terminals for sensors and instruments	No	4		
5.6.28		Supply and install Strut-Pro 200 - 300mm wide galvanised cable ladder including supports , hangers etc complete	m	8		
5.6.29		Supply and install Strut-Pro 100mm wide galvanised cable ladder inlcuding supports , hangers etc complete	m	5		
5.6.30		Trenching in all classes of medium to hard pickable soil material	m	60		
5.6.31		Compact and backfill the above trenches	m	60		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
Brought Forward						
5.6.32		Supply and installl cable danger marker tape for above cables	m	60		
5.6.33		Supply and install LG concrete cable markers	No	4		
5.7		**LIGHT FITTINGS**				
5.7.1		Supply the following light fittings as specified supplied by The Lighting Factor (TLF) Cell no : 0836582489 or similar approved prior to tenders closing				
5.7.2		Type A : TLF 1,5m 2 Tue LED double surface corrosion proof LED light	No	5		
5.7.3		Type B : TLF 16W LED external bulkhead light	No	4		
5.7.4		Type C : TLF 100 Watt LED floodlight	No	4		
5.7.5		Type D : TLF 45/55 LED streetlight with photo cell and mounting arm/spigot with 9m HDG steel pole Install the light fittings supplied above :	No	1		
5.7.6		Type A : TLF 1,5m 2 Tue LED double surface corrosion proof LED light	No	5		
5.7.7		Type B : TLF 16W LED external bulkhead light	No	4		
5.7.8		Type C : TLF 100 Watt LED floodlight	No	4		
5.7.9		Type D : TLF 45/55 LED streetlight with photo cell and mounting arm/spigot & 9m steel pole	No	1		
5.7.10		Supply and install 1/2 inch socket and stop-cock for no flow switch, pressure switch, pressure gauges etc on the delivery manifold for pump protection (this item may not be rremoved if not required)	Sum	6		
5.8		LIGHTNING PROTECTION & EARTHING INSTALLATION - **PUMP STATIONS & MCC ROOM 1 (** 1 structure/s - container type) Supply and install the lightning protection and earthing installation as specified and shown on the drawings or as directed by the Engineer:				
5.8.1		Trenching and backfilling for earth mat (200wide X 600deep)	m	30		
5.8.2		70mm square bare copper ground trench earth ring main	m	30		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
Brought Forward						
5.8.3		70mm square PVC insulated bonding earth conductors	m	15		
5.8.4		Brass earth bushes flush with concrete connected to reinforcing steel in wall or roof	No	4		
5.8.5		25 dia PVC conduit surface or built into brick or concrete wall for earthing wires	m	15		
5.8.6		10 dia solid aluminium roof terminal conductor fixed/saddled to concrete roof	m	25		
5.8.7		Connect to steel handrailing , staircase , doors , crawl beams etc at points indicated by Engineer	No	2		
5.8.8		70/70mm exothermic welds including Denso taping	No	8		
5.8.9		70mm square terminations	No	8		
5.8.10		1-6 to 2 m long earth electrodes (include for connections to earth mat)	No	6		
5.8.11		Test and commission the lightning protection and earthing systems for the pump station sites and the other structures on site/s and issue of the earth test results, compliance certificates and data packs. Include as built layouts.	Sum	1		
5.8.12		Carry out earth resisitivity surveys for the pump station sites and the other structures one site/s and provide results with recommendations for the number and spacings of earth electrodes required	Sum	1		
5.9		**SIGNAGE , EXTINGUISHERS etc** Supply and install the following in the MCC and Pump Rooms etc:				
5.9.1		a) Warning electricity danger notices	No	1		
5.9.2		b) No un-authorized entry notices	No	1		
5.9.3		c) Warning - machine starts automatically notices	No	1		
5.9.4		d) 5kg CO_2 fire extinguishers with signage	No	1		
5.9.5		Provide labels to the MCCs and other equipment	Sum	1		
5.9.6		Label pumps (number plate type labels)	No	2		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
Brought Forward						
5.10		**INSTRUMENTATION**				
5.10.1		Supply and deliver the DN200 PN16 Krohne or similar approved mag flow meter (sensor and transmiter) with earthing rings etc as specified with 30m of signal cabling suitable for raw sewage applications (supplier to select correct meter)	Sum	1		Rate Only
5.10.2		Supply and deliver the DN150 PN16 Krohne or similar approved mag flow meter (sensor and transmiter) with earthing as specified with 30m of signal cabling. Suitable for sewage works application	Sum	1		Rate Only
5.10.3		Install , test and commission the above mag flow meter (include for supplier to be in attendance)	Sum	1		Rate Only
5.10.4		Earth the mag flow meter to manufacturer's instructions and connect to the pump station or site wide earth mat	Sum	1		Rate Only
5.10.5		Supply, install and connect up a IP65 enclosure with DC supply surge protection and serial surge protector with DIN rail etc for the flow meter	Sum	1		Rate Only
5.10.6		Supply the IFM or similar approved sewer sump level sensor and remote digital transmitter range 0-10m with signal cable of 15 m between sensor and transmitter as specified or similar and equal aprroved	Sum	1		
5.10.7		Install and connect up the level transmitter supplied above in vandalproof housing	Sum	1		
5.10.8		Install the signal cabling between the sensor and transmitter in sleeves and conduits provided elsewhere	Sum	1		
5.10.9		Supply and install the following electric actuators as specified:				
5.10.10		a) Auma or similar and equal approved electric actuator to fit 100 dia valve as specified	No	1		Rate only
5.10.11		Supply and install the digital instrument panel for the sump level sensors etc as specified (install in pump room etc)	Sum	1		Rate Only
5.11		**INSTRUMENT CABLING**				
		Supply and install the following instrument cabling and terminations. Ethernet cables to be CAT6E industrial grade ethernet cables. Cable ends to include cable numbering etc (FOR RATES ONLY)				
5.11.1		a) 1.0mm² twisted pair 6 core cable	m	10		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
Brought Forward						
5.11.2		b) 1.0mm² twisted pair 6 core terminations	m	1		Rate Only
5.11.3		e) Fibre optic cabling 4 Core single mode	m	1		Rate Only
5.11.4		f) Fibre optic cabling termination	No	1		Rate Only
5.11.5		g) Dekabond cabling	m	1		Rate Only
5.11.6		h) Dekabond terminations	No	1		Rate Only
5.11.7		I) Modbus cabling	m	1		Rate Only
5.11.8		m) Modbus terminations	No	1		Rate Only
5.11.9		n) Cable basket 150mm heavy duty	m	2		Rate Only
5.11.10		Earth the completed electrical installation in accordance with SANS10142 for all the pump station buildings on the different site/s	Sum	1		Rate Only
5.11.11		Provide test equipment, test and commission the entire electrical installation for the pump stations and sumps including hand-over (include to provide all test and commissioning reports)	Sum	1		
5.11.12		Supply the electrical certificate of compliance (COC) for the pump station and sewer sumps sites and for all structures on site and MCCs (separate COC for each site or DB)	Sum	1		
5.11.13		Assist with testing and commissioning of the pumps/pumping system including telemetry system for the pump station	Sum	1		
5.11.14		Provide 4 sets of the O & M manuals in hard copies and soft copies of all O & M manuals ,operating and maintenance manuals/instructions , hand over data packs etc complete for all MCCs , electrical equipment , instrumentation etc complete for the pump station site (include for mechanical equipment and pumping plant)	Sum	1		
5.11.15		Allow a sum to provide MCC designs, GA and wiring diagrams , componenet lists , P & IDs,,cable block and loop diagrams, instrument block and loop diagrams , I/O lists , process control network diagrans , cable routes , data packs and all other information as specified and requested for the pump station and associated structures (include to up-date to as-builts)	Sum	1		
5.11.16		Allow a provisional sum of R 65 000.00 for any unforseen work to be used entirely at the discretion of the Engineer or Client	Sum	1	R 65 000,00	R 65 000,00
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Brought Forward						
5.12		**TELEMETRY , SECURITY & INTRUDER**				
		Supply , install , test and commission the following complete as for telemeytry equipment and systems :				
		Site 1 - Hoof Pump Station 1				
5.12.1		GSM equipment with SIM & data contract for 24 months for 1 site	Sum	1		Rate Only
5.12.2		Complete telemetry panel (with PSU/MCC surge protection/terminals / battery & charger / consumables etc complete) for 1 site of R 120 000,00 as provisional sum allowance	Prov Sum	1		Rate Only
5.12.3		Mimic displays for 1 x level and dislay with LEDs for the 1 pump stations status - Site 1 pump station	Sum	1		Rate Only
5.12.4		Installation of telemetry equipment including 30m of siganal and instrument cabling for the pump station site	Sum	1		Rate Only
5.12.5		Pump Room / MCC Room PIR motion sensor with control panel , alarm beacon siren , keypad , conduit , wiring , integration into telemery panel etc complete for the pump station site	Sum	1		Rate Only
5.12.6		Allow an amount for all the engineering , layouts, wiring diagrams etc for all the pump station site	Sum	1		
5.12.7		Test and commission the telemetry and intruder & security systems for the pump	Sum	1		
5.12.8		Allow an amount to train the Client's operations and maintenace personnel for the pump station	Sum	1		
5.12.9		Allow an amount to provide the O & M manuals, as builts , hand-over data packs, compliance certificates , wiring diagrams etc complete	Sum	1		
Total Carried Forward						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
Brought Forward						
5.12.10		Supply and install Luft or similar approved extract fan type LPA500/43F , 1350 rpm 0,37kW 1,3A with WC500 cowl and insect screen including wall openings etc complete	No	1		
5.12.11		Communicating and liasing with Eskom or the Municipality Electricity supply authority for the power supply and switch-on to all the site/s including submitting all documents required	Sum	1		
5.12.12		Provide training to the Client's operations and maintenance personnel on the MCCs , controls, instrumentation and PLC/HMI etc for the complete works for the site/s (Include training for 4 people)	Sum	1		
5.12.13		Allow an amout of R 55 000,00 for the Engineer to attend MCC FATs and for travel costs to site etc. Include for profit and attendance. (To be paid directly to Engineer prior to work being done)		1	R55 000,00	R55 000,00
5.12.14		Allow for profit and attendance on item 2.33 above	%	R55 000,00		
5.12.15		Allow a provisional sum of R 100 000,00 for the Eskom or Municipality power supply upgrade or new supplies to the pump station site (note that this amount is an estimate only, the final amount will depend on the quote received after application)		1	R100 000,00	R100 000,00
5.12.16		Allow for profit and attendance on item 2.35 above	%	R100 000,00		
Total for Section 5 PS Electrical Carried Forward To Summary						

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		SECTION B5 :GUARD HOUSE				
		Construct a guard house measuring 4.5 m (L) × 2.2 m (W) × 2.44 m (H) with external walls built using 230 mm thick brickwork, including a toilet room of 1.2 m × 2.2 m formed with 110 mm thick internal brick partition walls, and complete all work in accordance with the project specifications.				
6.1	**SANS 1200C**	Site Clearance				
6.1.1		Clear and grub of strips (where not cleared within other clear and grub areas)	m2	20		
6.1.2		Remove topsoil to nominal depth of 150mm, stockpile	m3	3		
6.2		**Bulk excavation**	m3	4		
		Excavate in all materials and use for embankment or backfill or dispose as ordered from				
6.2.1		a) Necessary excavations	m3	2		
		Extra-over for:				
6.2.2		Intermediate excavation	m3	2		
6.2.3		2, Hard rock excavations	m3	2		
6.3		**Restricted excavation:** Excavate for restricted foundations, footings and pipe trenches in all materials and use for backfilling or embankment or dispose:				
6.3.1		a) To bottom of blinding layer	m3	1		
6.3.2		b) Inlet and outlet pipe	m3	4		
		Extra-over for:				
6.3.3		1. Intermediate excavation	m3	3		
6.3.4		2. Hard rock excavation	m3	1		
6.3.5		3. Hand excavation and backfill only where ordered by the Engineer "	m3	1		
6.4		**Dealing with water (Including the continual dewatering of foundations for the encountering of ground water and stormwater)**	sum	1		
6.5		**Safeguard the bulk excavation and maintain for the construction period until the backfill is complete**	sum	1		
		Earth filling supplied by the contractor, compacted to 93% Mod. AASHTO density unless otherwise described: To trenches and under solid floors, steps, etc.	m3	2		
		Soil poisoning and protection against termites. Chlordane or Aldrin or similar type termite soil insecticide applied by the contractor and mixed and applied in the presence of the engineer. :				
		Under solid floors etc. including forming and poisoning shallow furrows against walls, etc and filling in furrows and ramming.	m2	8		
6.6		**CONCRETE**				
	SANS1200G	SCHEDULED FORMWORK ITEMS				
6.6.1		Narrow widths (up to 300mm wide): To sides of floor slabs	m	6		
6.7		**Box out holes and form voids:**				
		Small, circular of Diameter up to and including 0,35 m:				
6.7.1		Over 0 m deep up to 0,5m deep	No	1		
		PRE-CAST CONCRETE				
		Standard pre-stressed fabricated lintels including min. 300mm bedding bearing ends on both sides in 'Buildcrete' cement mortar and propping as necessary:				
		i)103 x 110mm Lintels x 1200mm long over door frames	no	1		
		iii) 103 x 110mm Lintels x 2400mm long over windows and vranda	no	1		
CARRIED FORWARD						

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
6.8		**SCHEDULED REINFORCEMENT ITEMS**				
		Mild steel bars				
6.8.1		All sizes	t	0,5		
		High-tensile steel bars				
6.8.2		All sizes	t	0,5		
		High-tensile welded mesh				
6.8.3		(a) Reference 395	m2	8		
6.8.4		(b) Reference 617	m2	0		
6.8.5		(c) Reference 888	m2	0		
6.7		Strength concrete 15 MPa/19mm				
6.7.1		(a) Blinding layer in 50 mm thickness	m3	0,4		
6.8		Strength concrete 20 MPa/19mm				
6.8.1		a) Screed to Floor Slab	m2	6		
6.9		Strength concrete 25 MPa/19 mm				
6.9.1		(a) Apron slab	m3	0,5		
6.10		Strength concrete 30 MPa/19 mm				
6.10.1		(a) In strip footings	m3	2		
6.10.2		(b) In floor slabs	m3	2		
6.11		Test blocks				
6.11.1		**Making and testing 150 × 150 × 150mm concrete strength test cubes**	**Prov sum**	**1**		
6.11.2		Overheads, charges and profit on item 8.14.1 above	0,1	1		
6.12		**Unformed surface finishes:**				
		Wood-floated finish				
6.12.1		a) Upper surface floor slab (screed)	m2	6		
6.12.2						
		Steel-floated finish				
6.12.3		(a) To top of floor slab	m2	6		
6.13		BRICKWORK				
		Build the following brickwork according to the drawings and specifications including joints, brick force, etc.: brick force after every 3 course				
CARRIED FORWARD						

NAME OF CLIENT DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY
CONTRACT NUMBER T14/2026
PROJECT DESCR. APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS
SECTION B5 :GUARD HOUSE

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
6.13.1		230mm Brickwork to exterior/interior walls with both faces in semi-face brick Bonny Burn" FBA in stretcher bond"	m2	20		
6.13.2		230mm Damp proofing laid horizontally under windowsills	m	8		
6.14		Waterproofing				
6.14.1		Damp-proofing of walls and floors. One layer of 375 micron Brickgrip DPC or similar approved embossed damp-proof course: 220mm Wide in walls.	m	10		
6.14.2		One layer of 250 micron Gunplas USB Green or similar approved waterproof sheeting sealed at laps with Gunplas Pressure Sensitive Tape: Under concrete surface beds	m²	8		
6.15		ROOF COVERINGS				
	SABS 1200HB	0.6mm 'Chromadek' IBR or similar approved roof sheeting and accessories, fixed to timber purlins with 'Posidrive' or similar approved roof screws in accordance with the manufacturer's specifications: 0.6mm Aloe Green' IBR roof sheeting with 15deg.	m2	16		
6.15.1		**Roof and wall insulation. 'Sisalation 405 Multi Purpose' or similar approved insulation, suspended on 2mm galvanised wires, fixed to purlins @ 300mm c/c:**	**m2**	**16**		
6.15.2		462mm Girth aluminium ridge flashing to match roof sheeting as per manufactures specificationand detail complete	m	5		
6.15.3		Alluminium ogee gutter	m	8		
CARRIED FORWARD						

NAME OF CLIENT DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY
CONTRACT NUMBER T14/2026
PROJECT DESCR. APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS
SECTION B5 :GUARD HOUSE

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
6.16		CARPENRTY AND JOINERY Engineer Certified, designed and analysed, pre-fabricated roof construction. Plate nailed timber roof truss construction, formed of CCA treated sawn softwood, with patented galvanised plate nailed connections, fixed in position: Roof construction to Gable roof according to detail drawings, including all trusses, TECO Products or similar approved , Bracing & Runners. (wall plates & purlins elsewhere).				
6.16.1		38 x 114mm Wall plate	m	10		
6.16.2		114 x 38 mm rafters spaed at max 600 cc	m	25		
6.16.3		38 x 76m Purlins including fixing to trusses using hurricane clips.	m	31		
6.16.4		Tilter batten planed from 50 x 75mm Purlin including fixing to trusses using hurricane clips.	m	11		
6.16.5		Fascias, bargeboards and other fibre cement products. 80x225mm Tempered bargeboard, including fixing to roof gable end.	m	8		
6.16.6		225x15mm Tempered fascia, fixed to tilter batten.	m	21		
6.17		CEILINGS				
6.17.1		4mm Nutec or similar approved ceiling board, fixed to 38x38mm battens at max. 400mm c/c. Rate to include battens.	m2	10		
6.17.2		Extra over ceiling and brandering for 600 x 600mm trap door and frame and H-profile grid fitted flush in opening including any additional brandering	no	1		
6.17.3		75mm Coved Nu-cornice or similar approved applied to manufacturer's specifications.	m	15		
6.18		DOORS Solid Meranti FL doors:				
6.18.1		Door Aluminium Ib Solid Brz 890 Right (DOOR-D1)	no	1		
6.19		TILLING				
6.19.1		Tiling Prepare floor surfaces and lay floor tile in accordance with suppliers specification. 400 x 400mm Johnson or similar approved ceramic tiles fixed with adhesive and with 8mm joints in both directions and flush pointed with tinted waterproof jointing compound and sealed as per manufacturer's specifications (colour to be confirmed by client or client's agent)				
		on floor	**m2**	**10**		
6.20		METALWORK				
6.20.1		Alluminium window units as per approved system, complete with subframes, ironmongery, glass, sealing, etc and fixing to brickwork or concrete Approximately 1500 x 1200 Aluminium winodw 26mm Case Brz ptt1512	no	1		
CARRIED FORWARD						

ITEM NO.	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
6.21		**ELECRICAL WORKS**				
		Electrical installation certified by a registered Electrician. All of the following items are				
6.21.1		**to include for all supply, chasing, conduiting, draw wires, wiring, installation and testing, including DB**				
		Main electrical supply to the guardhouse	m	200		
		Plugs etc.				
6.21.2		Std 15A Double wall plug.	No	1		
6.21.3		Other connection points and switchgear	No	2		
6.21.4		Ceiling light point.	No	1		
6.21.5		Light switch - 2 lever	No	1		
6.21.6		Exterior light point	No	2		
		Light fittings - Supply and fit:				
6.21.7		Exterior wall light - 'Beka' 31007 BULKHEAD LED7 LED 7/2.4W – 1142 or similar approved LED Bulkhead with metal body and cover.	No	2		
TOTAL CARRIED FORWARD TO SUMMARY						

ITEM	REF	DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
7.1		**CLEARING AND GRUBBING**				
		Clearing:				
7.1.1		Clearing with machines and some hand labour where necessary	ha	0,12		
		Grubbing:				
7.1.2		Grubbing with machines and some hand labour where necessary	ha	0,12		
		Removal and grubbing of large trees and tree stumps:				
7.1.3		Girth equal to or exceeding 1,0m up to and inculding 2,0m	No	5		
7.1.4		Girth exceeding 2,0m up to and including 3,0m	No	4		
7.1.5		Girth exceeding 3,0m	No	3		
7.1.6		Removal of trees in forests and plantations	ha	2,48		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
					TOTAL BROUGHT FORWARD	
7.2		**LOADING AND HAULING**				
		Loading:				
7.2.1		Loading from stockpile using machines and some hand labour where necessary	m^3	295		
		Hauling:				
		Hauling material for use in the works and off-loading it on site of the works				
7.2.2		(a) Soil, gravel, crushed stone and Pavement Layer Material	m^3-km	30		
		Hauling material to spoil and off-loading it at a designated spoil area:				
7.2.3		(b) Soil and gravel material	m^3-km	110		
7.2.4		(c) Boulders	m^3-km	8		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
					TOTAL BROUGHT FORWARD	**0,00**
7.3		**DRAINS**				
		Excavation for open drains:				
		Excavating all material situated within the following depth ranges below the surface level using conventional methods:				
7.3.1		(a) 0 m to 1,5 m	m³	9		
7.3.2		Extra over sub-item C3.1.1.1 for excavation in hard and boulder material, irrespective of depth	m³	1		
		Excavation and disposal of material for subsoil drainage systems:				
		Excavating in all material situated within the following depth ranges below the surface:				
7.3.3		(a) 1,5 m to 2,0 m	m³	9		
7.3.4		Extra over sub-item C3.1.4.1 for excavation in hard and boulder material, irrespective of depth	m³	1		
		Impermeable backfilling to subsoil drainage systems				
7.3.5		G5 material obtained from commercial sources	m³	2		
7.3.6		Extra over items C3.1.5.2 for stabilisation with 4,0 % CEM II (32.5) cement	m³	2		
		Natural permeable material in subsoil drainage systems (approved crushed stone):				
7.3.7		Crushed stone obtained from commercial sources (13.5mm)	m³	1,5		
		Natural permeable material in subsoil drainage systems (approved natural sand):				
7.3.8		Natural sand from commercial sources	m³	1		
7.3.9		Pipes in subsoil drainage systems:				
7.3.10		U-PVC pipes and fittings, normal duty, complete with couplings (100mm dia. slotted)	m	17		
7.3.11		Geotextiles (Type Kaytech U14 or similar approved)	m²	22		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.5		**BORROW MATERIALS**				
		Removal of the overburden:				
7.5.1		In borrow pits	m	1,5		
		Finishing-off borrow areas in:				
7.5.2		(a) Borrow pit	ha	1,5		
		Providing a crushing and/or screening plant:				
7.5.3		(a) Single-stage crusher with screen.	No	1		
		Producing the material by:				
7.5.4		Single-stage crushing	m³	250		
7.5.5		Stockpiling of material	m³	330		
7.5.6		Blasting of material in borrow pit (measured in place).	m³	30		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.6		**CUT MATERIALS** Excavating of materials in box cuts, material obtained from				
7.6.1		Soft excavation	m³	215		
7.6.2		Boulder excavation class A	m³	6		
7.6.3		Hard excavation (other than by blasting)	m³	14		
7.6.4		Hard excavation (by blasting)	m³	14		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.7		**COMMERCIAL MATERIALS** Commercial material identified by the contractor from commercial, private or other non-commercial suppliers				
7.7.1		(c) Lower selected subgrade layer (G9 Imported - 150mm thk) compacted to 93 % of MDD	m³	132		
7.7.2		(d) Upper selected subgrade layer (G7 Imported - 150mm thk) compacted to 95 % of MDD	m³	132		
7.7.3		(e) Gravel wearing course layer (G5 Natural Gravel or better - 150mm) compacted to 95 % of MDD	m³	132		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.8		**ROADBED** Roadbed construction and compaction				
7.8.1		Compaction of in-situ material to 90 % of MDD (150mm thk)	m³	295		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.9		**FILL** Fill construction Normal fill material in compacted layer thicknesses of 200 mm and less:				
7.9.1		(a) Compacted to 90 % of MDD	m^3	215		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.10		**ROAD PAVEMENT LAYERS**				
7.10.1		Compiling and implementing M&U plans for the construction of all the pavement layers	No	1		
		Construction of pavement layers				
		Construction of layers using conventional construction methods:				
7.10.2		(a) Lower selected subgrade layer (G9 Imported - 150mm thk) compacted to 93 % of MDD	m³	10,00		
7.10.3		(c) Upper selected subgrade layer (G7 Imported - 150mm thk) compacted to 95 % of MDD	m³	135		
7.10.4		(g) Gravel wearing course layer (G5 Natural Gravel or better - 150mm) compacted to 95 % of MDD	m³	147		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.11		**PITCHING, STONEWORK, CAST IN SITU CONCRETE FOR PROTECTION AGAINST EROSION**				
		Stone pitching				
7.11.1		Grouted stone pitching on a concrete bed	m^2	10		
TOTAL CARRIED FORWARD TO SUMMARY						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.12		**NON-STRUCTURAL GABIONS** Foundation trench excavation: Excavating all material situated within the following depth ranges below the surface level				
7.12.1		(a) 0 m to 1,5 m	m³	2		
7.12.2		Surface preparation for bedding the gabion boxes and mattresses Gabion boxes and mattresses:	m²	2		
7.12.3		(i) Galvanized gabion boxes, Length 1m, Width 2m, Depth 1m and nominal diameter of mesh wire 2.7mm, mesh size 80mm x 100mm	m³	5		
7.12.4		(ii) Galvanized gabion boxes, Length 2.0m, Width 2m, Depth 1m and nominal diameter of mesh wire 2.7mm, mesh size 80mm x 100mm.	m³	5		
7.12.5		(i) Galvanized gabion mattresses, Lenght 2m, Width 1m, Depth o.23mm, mesh size 80 x 100mm nominal diameter of mesh size 2,2mm, and 1m diaphragm spacing.	m³	5		
7.12.6		Geotextile (kaytech grade A4 or similar).	m²	10		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.13		**ROAD RESTRAINT SYSTEMS**				
		Complete galvanized system compliant to SANS 1350:				
7.13.1		(a) On timber posts (Drawing reference SD1101)	m	50,00		
7.13.2		(d)End treatments where single guardrail sections are specified (Drawing reference SD1102)	No	10,00		
		Extra over for horizontally curved guard rails				
7.13.3		Extra over C11.4.1 for horizontally curved guard rails factory bent to a radius of less than 45 m	m	55,00		
		Additional guardrail posts for 3,81 m systems:				
7.13.4		Timber	No	10,00		
		Reflective plates				
7.13.5		Steel plates	No	5,00		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.14		**ROAD SIGNS**				
		Road signboards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class I retro-reflective material, where the sign board is constructed from:				
		Prepainted galvanized steel plate:				
7.14.1		(b) Area exceeding 0,5 m2 but not 2,0 m2	m²	1,00		
7.14.2		(c) Area exceeding 2,0 m2 but not 10 m2	m²	2,00		
		Regulatory signs, permanent				
7.14.3		(a) 600 mm diameter (aluminium sheet)	No	1,00		
		Warning signs, permanent				
7.14.4		(a) 600mm size (aluminium sheet)	No	1,00		
		Extra over on item C11.6.1 for using:				
		Background of retro-reflective material:				
7.14.5		(a) Class I	m²	1		
		Lettering, symbols, numbers, arrows, emblems and borders of retro-reflective material:				
7.14.6		(a) Class III	m²	1		
		Road sign supports (overhead road sign structures excluded):				
7.14.7		Timber (150mm diameter)	m	20,00		
		Danger plates at culverts/structures				
7.14.8		Size 150 x 600 mm (timber post and reflective material)	No	1,00		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.15		**FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS**				
		Finishing the road and road reserve:				
7.15.1		Single carriageway road	km	0,15		
TOTAL CARRIED FORWARD						

ITEM		DESCRIPTION	UNIT	QTY	RATE	AMOUNT R
TOTAL BROUGHT FORWARD						
7.16		**TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP**				
7.16.1		(a) Other special tests requested by the Engineer	Prov Sum	1	15 000,00	15 000,00
7.16.2		(b) Handling cost and profit in respect of sub item B81.02 (a) above	%	15000		
		Cost of Testing:				
7.16.3		(c) Straight edge, 3m long.	No	2		
TOTAL CARRIED FORWARD TO SUMMARY						

NAME OF CLIENT **DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY**

CONTRACT NO.: **T14/2026**

PROJECT DESCR. **APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS**

SECTION B7 : REPLACEMENT OF RAISING MAIN

ITEM	REF	DESCRIPTION	UNIT	LIC	QTY	RATE	AMOUNT
8		SECTION B7 : REPLACEMENT OF RAISING MAIN EARTHWORKS (SEWERS)					
8,1		SITE CLEARANCE					
8.1.1		Clear vegetation and trees of girth up 1m	m		420		
8.1.2		Remove 100mm topsoil and maintain (3m width)	m		420		
8.2		EXCAVATION					
8.2.1		Excavate in all trenched backfill, compact and dispose of surplus/unsuitable material for pipes: pipes up to 110mm diameter. and including shoring/battering as applicable, inclusive of dewatering For depth total depth trench:					
8.2.2		a) Exceeding 0.0m but not 1.0m depth	m		10		
		Excavate in all trenched backfill, compact and dispose of surplus/unsuitable material for pipes: uPVC pipes from 110mm up to 315mm diameter and including shoring/battering as applicable, inclusive of dewatering. For depth total depth trench:					
8.2.3		a) Exceeding 0.0m but not 1.0m	m		10		
8.2.4		b) Exceeding 1.0m but not exceeding 2.0m	m		380		
8.2.5		c) Exceeding 2.0m but not exceeding 3.0m	m		10		
		d) Exceeding 3.0m but not exceeding 4.0m			10		
8.2.6		Extra over 4,2 for items above:- 1) Intermediate	m³		630		
8.2.7		2) Boulder Class A	m³		10		
8.2.8		3) Hard rock (Control Blasting)	m³		10		
8.2.9		4) Hard rock (Pneumatic or other)	m³		10		
8.2.10		Excavate and dispose of unsuitable material from trench bottom (Provisional)	m³		630		
8.2.11		Remove & Dispose Blocked Sludge to desiganted area	sum		1		
		Removal of the existing 315mm dia asbestos pipe & MH	m		420		
		Dealing with water	sum		1		
TOTAL CARRIED FORWARD							

ITEM	REF	DESCRIPTION	UNIT	LIC	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD							
		EXCAVATION. ANCILLARIES					
		Make up deficiency in backfill material :(Provisional)					
8.2.12		a) From other necessary excavations on site	m³		10		
8.2.13		b) By importation from commercial or off-site sources selected by the Contractor (Provisional)	m³		15		
8.2.14		c) By importation from designated Borrow Pits (Provisional)	m³		10		
8.3		EXISTING SERVICES					
		Services that intersect a trench					
8.3.1		a) Cables	No.		2		
8.3.2		b) Water pipes	No.		2		
8.4	8.3.6	FINISHINGS					
	SANS	MEDIRUM PRESSIRE PIPELINES					
8.5	1200 LD	PIPEWORK					
	8.2.1	a) Supply, lay, joint and bed (flexible bedding) and test pipelines:					
8.5.1		i) 315mm uPVC Class 12	m		420		
	8.2.2	Extra-over items 8.22.6 - 8.22.10 :					
8.5.3		315mm Ø Bends	No.		21		
8.12	SABS 1200 LB	SECTION 2 : BEDDING (PIPES)					
		PROVISION OF BEDDING					
8.12.1		a) Selected granular bedding material	m³		5		
8.12.2		b) Selected fill blanket material	m³		126		
	8.2.2.3	From commercial sources					
8.12.3		a) Selected granular bedding material	m³		5		
8.12.4		b) Selected fill blanket material	m³		126		
		Backfilling & compaction of excavated material to NGL	m³		378		
TOTAL CARRIED FORWARD							

SECTION C1: BETA PUMP STATION EXTERNAL WORKS

ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
2		**SECTION C1: BETA PUMP STATION EXTERNAL WORKS**				
2.1		**EXCAVATIONS**				
2.1.1		Clean, grub and cut away all vegetation within the designated construction area (2m wide strip)	m2	400		
2.1.2		Excavations for Posts	m3	8		
2.2		**CONCRETE**				
2.2.1		15 Mpa Concrete Footings/Bases: Cast Concrete bases (400 x 400 x 750mm) - Top of concrete base to be 50mm above ground level	m3	8		
2.3		**FENCE WORKS**				
		GALVANIZED CLEARVU SECURITY BARRIER FENCING SYSTEMS				
		"Cochrane ClearVu" galvanised "Marine Fusion Bond" coated taper locking posts set in exact position in concrete, including UV stabilized polymer cap (excavation and concrete base elsewhere measured)				
2.3.1		3000mm Long 85 x 45 x 85mm post including Locking Recess Mechanism	m	52		
2.3.1		Security fence 2.4m high of 3297mm wide x 2400mm high panels, formed with 3mm diameter wired mesh with aperture size 76.2 x 12.7mm, each panel reinforced with four 50mm deep 'V' formation horizontal recessed bands, two 70 degree flanges along both sides and two 30 degree flanges along top and toe.	m	110		
2.3.3		Sliding motor vehicle gate 5000 x 2400mm high overall, formed with 75 x 75 x 2mm thick hollow section gate surround with 45 x 45 x 3mm angle section guide rail and two 100 x 50 x 2mm thick hollow section vertical intermediate rails to form three gate panels, gate panels filled in with three standard flat "Cochrane ClearVu" panels without "V" formation and secured to gate frame and intermediate rails with 50 x 5mm flat section "Securifor Fixators" sub-frames and M8 counter sunk stainless steel hex-screws with dome nuts at 381mm centres, floor track of 10.0m IPE 100 I-section and 20mm diameter solid steel rod welded together and casted into concrete groundbeam, two pairs of heavy duty rollers fitted to the underside of the gate, all as per attached drawings (concrete and guide posts elsewhere measured)	No	1		
TOTAL CARRIED FORWARD						

SECTION C1: BETA PUMP STATION EXTERNAL WORKS

ITEM NO.	PAYMENT REF	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
2.4		**BETA PUMP STATION - INLET CHANNEL** Cleaning and dispose of old dirt/sludge within sumps & grit and other rubble within sumps: For depth total depth trench:				
2.4.1		a) desludging by means of honey sucker	sum	1		
2.4.2		b) Cleaning & clearing of the grit channel	sum	1		
2.4.3		c) Testing of the exisiting pipe works	sum	1		
2.5		**EQUIPMENT AT INLET WORKS**				
2.5.1		Handrake inlet screen with 2 x custom made handrakes, complete with foot plate, top of canal wall fixing plates and bolts & nuts - All SS 304L	No	1		
2.5.2		600 mm Wide SS 304L drip tray for screenings	No	1		
TOTAL CARRIED FORWARD TO SUMMARY						

SECTION C2 **PUMPSTATION CIVIL & STRUCTURAL**

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3		**SECTION C2: PUMPSTATION CIVIL & STRUCTURAL**				
3.1	**SABS 1200C**	**CLEAR AND GRUB**				
	8.2.1	Clear and grub				
3.1.1		Clear and grub including removal of trees and stumps of girth got sewer pumpstation platform and access road	m^2	90		
3.2	**SABS 1200C**	**SITE CLEARANCE**				
3.2.1	**8.3.1**	Removal topsoil to nominal 150mm, stockpile and maintain	m^2	90		
3.2.2	**8.3.1**	Excavate in all materials and use for embankment or backfill and dispose for platform and access road	m^2	90		
3.3	**SABS 1200D**	**BULK EXCAVATION**				
3.3.1	**8.3.2**	a) Bulk excavation in all materials cut to fill and/or spoill and place in embankment and compact to 90% AASHTO	m^3	45		
3.3.2		Extra-over item 4.3.1 for Internedaite excavation in	m^3	27		
3.3.3	**8.3.1**	E.O. for hard rock excavation (Pneumatic or other)	m^3	18		
3.4	**8.3.2 a)**	**RESTRICTED EXCAVATION**				
		Excavate in all materials and backfill or embankment for pump station and emergency storage tank **N.B. These excavations require lateral support and shoring**				
3.4.1		e) Pumphouse	m^3	45,1		
	8.3.2 2)	Extra Over Items above				
3.4.6		1) Intermediate	m^3	5		
3.4.7		2) Boulder Class A	m^3	1		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
3.4.8		3) Hard rock (Control Blasting)	m^3	4		
3.4.9		4) Hard rock (Pneumatic or other)	m^3	3		
3.4.10	8.3.2(c)	Excavate and dispose of unsuitable material from trench bottom (Provisional)	m^3	7		
3.4.11		Construct cut-off ditch/berm above pump station as per instruction by Engineer as per detail.	m	50		
3.5		**FINISHINGS**				
3.5.1	**8.3.6**	Topsoil to thickness of 100mm	m^2	180		
3.5.2	**8.3.7**	Re-grass embankment to pump station and access road	m^2	180		
3.6		**MISCELLANEOUS**				
3.6.1		Soil poison surface pump station platform and access road sprayed with “Round Up” or similar approved to prevent vegetation overgrowing the site in accordance with supplier’s coverage.	Sum	1		
3.7	**PBA**	**PUMPSTATION BUILDING**				
3.7.1		Excavate in all materials and backfill or embankment for pump station	m^3	15		
3.8		**BRICKWORK**				
3.8.1	**PBA - 4.1**	Brickwall, 230 mm thick wall, clay facebrick in class 1 mortar "Corobrick Fire Light Satin" or similar approved (include hot dipped galvanised wall ties)	m2	57		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
3.9.1		SABS brick reinforcement built in horizontally every third course	m	306		
3.9.2		Brick on edge header course over door and window openings	m	5,5		
3.9.3	**PBA - 4.12**	Air bricks 230 x 152 clay vermin proof built in	No	4		
3.9.4	**PBA - 4.3**	Pre-cast concrete lintels above doors and windows built in 230 wide x 100mm thick x 2100 mm long	No	1		
3.9.5		Pre-cast concrete lintels above doors and windows built in 230 wide x 100mm thick x 1200mm long	No	2		
3.9.6	**PBA - 4.1**	Fibre cement window sills 110 x 10 mm to in side face of windows.	Sum	2		
3.10	**PBA 4.17**	**WATERPROOFING**				
3.10.1		One layer of 375 micron damp proof course 230mm wide in walls	m	20		
3.10.2		250 micron USB Green Water proof sheeting under surface beds	m²	18		
3.11	**PB 12**	**METALWORK**				
3.11.1		D.V. steel door frame and double transformer steel door, 1600W x 2200 H fully louvred Type YV, complete with suitable 3 lever lockset built into walls with galvanised vermin proof mesh on the inside	No	1		
3.11.2		Extra over for purpose made opening 150 x 100mm to permit removal of pumps by use of gantry, including locking device as shown on the drawings	No	1		
3.12		**WINDOWS**				
3.12.1		Supply and build in Industrial windows type ALU, 950W x 800H mm with pressed steel louvres and galvanised vermin proof mesh on the inside	No	2		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
3.13		**FLOOR FINISH**				
3.13.1		Supply and apply slip resistant industrial epoxy cement self-smoothing composite floor as per manuafactures specification and engineer approval.	m2	18		
3.14		**BUILDING MISCELLANEOUS**				
3.14.1		Provision for furniture	Prov. Sum	1	25 000,00	R25 000,00
	SABS 1200 GA	**CONCRETE (SMALL WORKS)**				
		PUMP STATION & ANCILLARIES				
3.15		**Formwork**				
	8.2.1	Rough				
		Vertical unexposed undergound				
3.15.1		a) Pump Station Footing	m^2	24		
	8.2.2	Smooth				
3.15.2		a) Pump Station Footing	m^2	4		
3.15.3		b) Pump Plinth	m^2	5		
3.15.4		d) Pump house Roof slab	m^2	30		
	8.2.3	Narrow widths				
3.15.11		a) Pump Station Footing	m^2	2		
3.15.17		d) Roof slab	m^2	3		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
	8.2.4	Box out holes/form voids or cast in for pipework, manholes etc.				
		Large, other than circular, of areas over 0.1m^2 and to and including 0.5m^2				
3.15.18		a) Pump House Surface Slab	No.	5		
3.15.19		b) Pump house roof slabs	No.	5		
3.16	**8.1.2**	**REINFORCEMENT**				
		Mild steel bars				
3.16.1		a) Footings	kg	69		
3.16.2		b) Pump station surface bed	kg	100		
3.16.3		c) Pump station roof slab	kg	104		
		High-tensile steel bars				
3.16.4		a) Footings	kg	386		
3.16.5		b) Pump station surface bed	kg	566		
3.16.6		c) Pump station roof slab	kg	586		
3.17	**8.4**	**CONCRETE**				
3.17.1		Stone mat (up to 300mm thick, 19mm aggregate, wrapped in Bidim A4 for drainage under structure. Installed where instructed by Engineer)	m^2	34		
	8.4.2	**50mm depth of blinding layer in 15/20 concrete to:**				
3.17.2		a) Footings	m^3	1		
3.17.3		b) Surface Bed	m^3	2		
3.17.4		c) Sand Trap	m^3	0		
	8.4.3	Strength concrete Grade 30/19 watertight concrete to				
3.17.5		a) Concrete Footings	m^3	4		
3.17.6		b) Pump station surface slab	m^3	6		
3.17.7		c) Sand Trap	m^3	-		
3.17.8		d) Pumphouse roof slab	m^3	6		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
	8.4.3	Strength concrete Grade 15/19 for encasing pipes				
3.17.9		a) Pump Sump	m^3	3		
3.17.10		b) Pump Station walls (Suction and outlet pipework)	m^3	5		
3.17.11		c) Sand Trap	m^3	0		
	8.4.4	Unformed surface finishes Wood floated finish as specified to:				
3.17.12		a) Pump Sump	m^2	0		
3.17.13		b) Valve Chamber	m^2	0		
3.17.14		c) Sand Trap	m^2	0		
3.17.15		Steel floated finish to floor of pumpstation and roof slab	m^2	70		
3.18	**8.5**	**JOINTS**				
3.18.1		a) Concrete Footings	m	20		
3.18.2		b) Pump station surface slab	m	18		
3.18.3		c) Pumphouse roof slab	m	22		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
3.19		**MISCELLANEOUS**				
3.19.4		Supply and install 152mm x 152mm mild Universal Column SANS 50025/EN 10025 Grade S355JR with solid plates end at each end to measure on site, hot galvanized, to support valves in Pump station, as per detail	No.	3		
3.19.5		Construct 30/19 concrete thrust blocks, complete in pump station as per details.	No.	4		
3.19.6		Supply and install the GMS vent pipe for sump as per detail.	No.	2		
3.20	**PSHA 4.1**	**Mobile Gantry**				
3.20.1	**PSHA 4.1 & PSHA 4.2**	Mild steel gantry and crawler beam suited to accommodate beam, all inclusive	Sum	1		
3.20.2		Supply and install stainless ladder, as per details.	Sum	1		
3.20.3		safety signage to the requirements of the national building regulations SANS 10400.	Sum	1		
TOTAL CARRIED TO SUMMARY						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4.1		**SECTION C3 : BETA META SEWER PUMP STATION MECHANICAL** **Note : All pump pipework, valves, fittings and associated equipment are measured elsewhere under the civil works** **Design , supply , manufacture , deliver , offload , install , connect up, test and commission, guarantee and maintaing the pumping plant and associated equipment to LOCAL MUNICIPALITY STANDARDS and to the relevant SANS, BS or other recognised codes and standards**				
4.1.1		Design, manufacture , supply and deliver the following new sewer pump sets for the new pump stations for the Beta Meta Pump Station 2				
4.1.2		a) Beta Meta Station 2 - Sewage self priming pump supplied by Gorman Rupp Model TA60S-B/FM 76mm solids min duty 30,4l/s @ 20,17m head with 18,5kW IE4 WEG ir similar motor , air release, frame/base plate ,pulleys, belts, guards, all sensors etc complete as specified (1 duty and 1 stand-by) - refer to specifications for duty as specified	No	2		
4.1.3		a) Beta Meta Sewer Pump Station 2 - Supply and install the HDG steel suction pipe with bellmouth etc . Suction pipe from the wet well sump to the suction of the pump - Length and size to be determined by pump supplier , Refer pump station drawings	No	2		Rate only
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
4.1.4		Install and connect up of the new pump sets supplied above as follows :				
4.1.5		a) Beta Meta Sewage pumps for Pump Station 2	No	2		
4.1.6		Align all the pumps and provide certification	No	2		
4.1.7		Supply, install and connect up the following ancilliary equipment :				
4.1.8		a) Wika or similar pressure gauges 0 - 500kPA complete with piping, backing board etc	No	1		
4.1.9		b) Wika or similar pressure gauges 0 - 1000kPA complete with piping, backing board etc	No	2		
4.1.10		c) ½" BSP sockets with stop-cocks welded on steel pipework for pressure gauges , flow switches etc	No	4		
4.1.11		SAT - Site test and commission the following pump sets supplied above :				
4.1.12		a) Beta Meta Sewage pumps for Pump Station 2	Sum	1		
4.1.13		Assist with testing of the pumping systems and rising mains for the following :				
4.1.14		a) Beta Meta Sewage pumps for Pump Station 2	Sum	1		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
4.2		**PUMPSTATION - PIPEWORK**				
4.2.1		(Item 1) ø200mm 60° MEDIUM SEGMENT BEND STANDARD	No	3		
4.2.2		(Item 2) ø200mm FLANGED STEEL PIPE SPECIAL	No	2		
4.2.3		(Item 3) ø200mm Steel Reducer All Ends Flanged to SANS 1123 1600/3	No	2		
4.2.4		(Item 4) ø50mm FLEXIBLE COUPLING	No	2		
4.2.5		(Item 5) ø200mm NON- RETURN VALVE	No	2		
4.2.6		(Item 6) ø200mm WEDGE GATE VALVE	No	2		
4.2.7		(Item 7) ø200mm STEEL PIPE FBE	m	2		
4.2.8		(Item 8) ø200mm FLANGED STEEL Pipe	m	8		
4.2.9		(Item 9) ø200mm SPECIAL TEE ends flanged to SANS 1123 / SABS 1600, fabricated from mild steel, epoxy coated, PN16	No	2		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
4.3		**GRINDER**				
4.3.1		Design , manufacture, supply and deliver the Gorman Rupp - In-Channel Grinder Model TM 851206 2,2kW with control panel complete etc as supplied by Gorman Rupp as specified for Pump Station 2 for Beta Meta Pump Station (refer specification) Grinder to be In-Channel , not flanged In-Line	Sum	1		Rate only
4.3.2		Install and connect up the Grinder and control panel as specified supplied above	Sum	1		Rate only
4.3.3		Test and commission the Grinder and control panel complete as specified (supplier to be in attendance on site)	Sum	1		Rate only
4.3.4		Allow an amount for the Supplier & Engineer to attend the FAT for the pumps & motors (factory acceptance tests) at the pump manufacturer's facilities. To include all flights, travel, transfers, accommodations, meals, entertainment, car hire and travel etc complete	Sum	1		Rate only
4.3.5		Allow an amount for the Engineers cost to attend the FAT and SAT for the pumps & motors and grinders and for all travel costs to site (these costs to be paid directly to the Engineer prior to work being done)	Sum	1		Rate only
4.3.6		Allow for profit and attendance on above item 12.15	%	10		Rate only
4.3.7		Design , select and submit technical specfications and detailed dimensioned drawings for all the pump sets and grinders including pipework etc supplied above	Sum	1		Rate only
4.3.8		Design and submit layout drawings of the pump sets and pipework & valve details and layout drawings for each of the pump stations as follows :				
4.3.9		a) Beta Meta Sewage pumps for Pump Station 2	Sum	1		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
4.3.10		Prepare and submit test and commissioning data sheets for all the above pump stations for all pumps and grinder etc complete	Sum	1		
4.3.11		Submit the O & M manuals for all the above pump stations for pumps and grinder etc as specified	Sum	1		
4.3.12		Provide training for the Client's operations and maintenance staff for the entire pumping and grinder system for all the above pump station	Sum	1		
4.3.13		Allow for all labels and signs for all pumps and grinder for the above pump station	Sum	1		
4.3.14		Allow a provisional sum of R 75 000,00 for any unforseen work the amounts of which are to be used entirely at the discretion of the Engineer and Client	Sum	1	75 000,00	R75 000,00
4.3.15		Allow for profit and attendance on provisional sum above 12.23	%	75000		
4.3.16		Provide the O & M manuals in comprehensive format as specified for all the above pump station (5 hard and 5 soft copies)	Sum	1		
TOTAL CARRIED FORWARD TO SUMMARY						

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Brought Forward						
5,5		STAND-BY GENERATOR INSTALLATION BETA PUMP STATIONS				
5.5.1		Allow an amount for all Preliminary and General costs (P & Gs) for the generator installation complete	Sum	1		
5.5.2		Design , manufacture and supply the new stand-by diesel generator and control panel with canopy and controls complete as specified for Hoof and Beta Metal Pump Stations	Sum	2		
5.5.3		Design , manufacture and supply the stand-by diesel generator and control panel with canopy and controls complete as specified for Beta Metal Pump Station	Sum	1		
5.5.4		Deliver to site and offload the generator and associated equipment	No	2		
5.5.5		Rig into position and install the complete generator equipmemt	No	2		
5.5.6		Supply full tanks of fuel for testing and commissioning for Hoof and Beta Metal	Sum	1		
5.5.7		Supply and install all mandatory and statutory signage and notices for the 3 gen-sets	Sum	1		
5.5.8		Supply and install cable joints - 35mm² x 4 Core ECC cable	No	2		
5.5.9		Supply and install 50mm²x 4C PVC/ECC/SWA/PVC cable to SANS1507	m	120		
5.5.10		Supply cable glands including shrouds, lugs etc complete for the above cable	No	6		
5.5.11		Allow for the FAT of the all the 3 x generator sets including all costs for Engineer to attend	Sum	1		
TOTAL CARRIED FORWARD TO SUMMARY						

NAME OF CLIENT: **DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY**
CONTRACT NO. **T14/2026**
PROJECT DESCR. **APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS**
SECTION C3 **BETA META SEWER PUMP STATION MECHANICAL**

ITEM NO	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Brought Forward						
5.5.12		Allow an amount of R 35 000,00 for the Engineer to attend the FAT at the gen-set manufacturer's premises and for the site SAT (this amount to be paid directly to Engineer)	Prov. Sum	1	**35 000,00**	**35 000,00**
5.5.13		Allow for profit and attendance on item above 10.13	%	35 000		
5.5.14		Test and commission the entire generator installation complete for all 3 sites (3 gen-sets)	Sum	1		
5.5.15		Issue of the mandatory generator compliance and other certificates for all 3 x gen-sets	Sum	1		
Total for PS Mechanical Items Forward To Summary						

NAME OF CLIENT: DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY
CONTRACT NO. T14/2026
PROJECT DESCR. APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS

SECTION C4 ELECTRICAL AND INSTRUMENTATION INSTALLATION

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
5		**SECTION C4 : ELECTRICAL AND INSTRUMENTATION INSTALLATION** Design where required , supply all materials, plant etc. manufacture, deliver to site, draw ex stores, supply scaffolding and all supporting material, install, test and commission, guarantee and maintain the plant for 12 months and submit operating / maintenance manuals for the electrical installation in the following areas all to SANS 10142 , and the Local Authority requirement and approval and as specified and shown on drawings where available **(all items are re-measurable)** Supply , install , test and commission the following:				
5.1		**ELECTRICAL INSTALLATION - BETA META PUMP STATION** MOTOR CONTROL PANELS & DBs				
5.1.1		Design, manufacture , supply and deliver the 400V MCC02 for Beta Meta Pump Station 2 as specified (including all 18,5kW & 2,2kW VSDs /soft starters for pumps/grinder etc complete as specified)	Sum	1		
5.1.2		Install and connect up the MCC02 supplied above	Sum	1		
5.1.3		Supply and install the UPS as specifed	No	1		
5.1.4		Allow for the FAT & SAT of the MCC for MCC02 as specified	Sum	1		
5.1.5		Supply and install the 24V DC power supply in the MCC02 as specified	Sum	1		
5.1.6		Supply and install the low level floats with s/s chain and weights in the sewer suction sumps/s or wet well for the low level cut-out controls of the pumps	Set	1		
5.1.7		Supply and install the electronic IFM flow switch for no-flow protection for pumps as specified (suitable for raw sewage)	No	2		
TOTAL CARRIED FORWARD						

SECTION C4 ELECTRICAL AND INSTRUMENTATION INSTALLATION

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
		Supply and install new LV distribution boards as follows :				
5.1.8		a) Pump Station DB - 01 (surface)	Sum	1		
5.1.9		c) Guard House DB-02 (surface wearterproof)	Sum	1		
5.2		**TELEMETRY**				
		Allow a provisional sum for Remote Montoring & Control (RMC) telemetry system for the following sites as specified . To include radio survey & OTPC co-ordinates etc :				
5.2.1		a) Pump Station 2	Sum	1		Rate only
5.2.2		Allow for profit and attendance on above item 2.1.9.1	%	R0,00		Rate only
5.2.3		Supply and install the IFM pressure sensors as specified (for rate only)	No	1		Rate Only
5.2.4		Supply and install emergency weatherproof stop locks with stands adjacent the Self Priming Pumps on HDG bracket stands	No	2		
5.3		**CONDUITS , TRUNKING , BOXES ETC**				
5.3.1		20 dia 2 and 3 way galvanised and PVC round boxes with covers	No	15		
5.3.2		Galvanised 100 x 50 x 50 boxes and covers	No	12		
5.3.3		20 and 25 dia galvanised or PVC conduits fixed surface including bends, couplers , saddles etc	m	20		
5.3.4		Supply and install 250-300Amp TP 3 phase CB in existing MCC (include for droppers from busbars and all connections and terminations)	No	1		Rate Only
5.4		**WIRING & ACCESSORIES**				
5.4.1		PVC insulated copper wires with stranded conductors drawn into conduits , wireways etc				
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
5.4.2		1.5mm square	m	100		
5.4.3		2.5mm square	m	65		
5.4.4		4mm square	m	45		
5.5		**SOCKETS , SWITCHES AND ACCESSORIES**				
5.5.1		15 amp 3 pin industrial profile switch socket outlets with covers surface	No	4		
5.5.2		15 amp 3 pin switch socket outlet with covers surface	No	4		
5.5.3		15 amp 1 and 2 lever light switch with cover surface	No	2		
5.5.4		32 amp 5 pin WACO or similar industrial welding socket	No	1		
5.5.5		15 amp surface weatherproof 1 lever light switch with cover outdoor type	No	1		
5.5.6		10 amp TP three phase industrial type isolators front entry cord grip for extract fan supply	No	1		
5.5.7		10 amp DP industrial type isolators from entry cord grip for extract fan supply	No	1		
5.5.8		Photo cell	No	1		
5.5.9		Supply and install the following uPVC cable sleeves (this item may not be required if provided by civil contractor) :				
5.5.10		a). 75 diameter	m	8		
5.5.11		b) 150 diameter	m	8		
5.6		**CABLES & ACCESSORIES**				
5.6.1		Supply the following cables to SABS 1507 as amended as follows:				
5.6.2		1.5 mm square 2 core PVC/SWA/PVC/ECC	m	30		
5.6.3		1.5 mm square 3 core PVC/SWA/PVC/ECC	m	15		
5.6.4		1.5 mm square 4 core PVC/SWA/PVC/ECC	m	10		
5.6.5		10mm square 2 core PVC/SWA/PVC/ECC	m	5		
5.6.6		10mm square 3 core PVC/SWA/PVC/ECC	m	15		
5.6.7		16mm square 3 core PVC/SWA/PVC/ECC	m	15		
5.6.8		25mm square 4 core PVC/SWA/PVC/ECC	m	20		
5.6.9		35mm square 4 core PVC/SWA/PVC/ECC	m	60		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
5.6.11		1.5 mm square 2 core PVC/SWA/PVC/ECC	m	30		
5.6.12		1.5 mm square 3 core PVC/SWA/PVC/ECC	m	15		
5.6.13		1.5 mm square 4 core PVC/SWA/PVC/ECC	m	5		
5.6.14		10mm square 2 core PVC/SWA/PVC/ECC	m	15		
5.6.15		10mm square 3 & 4 core PVC/SWA/PVC/ECC	m	15		
5.6.16		16mm square 3 core PVC/SWA/PVC/ECC	m	15		
5.6.17		25mm square 4 core PVC/SWA/PVC/ECC	m	20		
5.6.18		35mm square 4 core PVC/SWA/PVC/ECC	m	60		
		Make off and terminate cables including glands , shrouds , lugs , cable tags etc complete				
5.6.20		1.5 mm square 2 core PVC/SWA/PVC/ECC	No	8		
5.6.21		1.5 mm square 3 core PVC/SWA/PVC/ECC	No	8		
5.6.22		1.5 mm square 4 core PVC/SWA/PVC/ECC	No	4		
5.6.23		10mm square 2 core PVC/SWA/PVC/ECC	No	2		
5.6.24		10mm square 3 & 4 core PVC/SWA/PVC/ECC	No	4		
5.6.25		16mm square 3 core PVC/SWA/PVC/ECC	No	4		
5.6.26		25mm square 4 core PVC/SWA/PVC/ECC	No	2		
5.6.27		35mm square 4 core PVC/SWA/PVC/ECC	No	2		
5.6.28		Install free issue pump power cables in sleeves or on cale tray to junction box (rate only)	Sum	1		Rate Only
5.6.29		Install free issue pump sensor and instrumentation cable in sleeves (rate only)	Sum	1		
5.6.30		CCG waterproof termination boxes with terminals for sensors and instruments	No	4		
5.6.31		Supply and install Strut-Pro 200 - 300mm wide galvanised cable ladder including supports , hangers etc complete	m	8		
5.6.32		Supply and install Strut-Pro 100mm wide galvanised cable ladder inlcuding supports , hangers etc complete	m	5		
5.6.33		Trenching in all classes of medium to hard pickable soil material	m	60		
5.6.34		Compact and backfill the above trenches	m	60		
TOTAL CARRIED FORWARD						

SECTION C4 ELECTRICAL AND INSTRUMENTATION INSTALLATION

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
5.6.35		Supply and installl cable danger marker tape for above cables	m	60		
5.6.36		Supply and install LG concrete cable markers	No	4		
5.7		**LIGHT FITTINGS**				
5.7.1		Supply the following light fittings as specified supplied by The Lighting Factor (TLF) Cell no : 0836582489 or similar approved prior to tenders closing				
5.7.2		Type A : TLF 1,5m 2 Tue LED double surface corrosion proof LED light	No	5		
5.7.3		Type B : TLF 16W LED external bulkhead light	No	4		
5.7.4		Type C : TLF 100 Watt LED floodlight	No	4		
5.7.5		Type D : TLF 45/55 LED streetlight with photo cell and mounting arm/spigot with 9m HDG steel pole	No	1		
5.7.6		Install the light fittings supplied above :				
5.7.7		Type A : TLF 1,5m 2 Tue LED double surface corrosion proof LED light	No	5		
5.7.8		Type B : TLF 16W LED external bulkhead light	No	4		
5.7.9		Type C : TLF 100 Watt LED floodlight	No	4		
5.7.10		Type D : TLF 45/55 LED streetlight with photo cell and mounting arm/spigot & 9m steel pole	No	1		
5.7.11		Supply and install 1/2 inch socket and stop-cock for no flow switch, pressure switch, pressure gauges etc on the delivery manifold for pump protection (this item may not be rremoved if not required)	Sum	6		
5.8		LIGHTNING PROTECTION & EARTHING INSTALLATION - **PUMP STATION & MCC ROOM 2 (** 1 structure/s - container type)				
5.8.1		Supply and install the lightning protection and earthing installation as specified and shown on the drawings or as directed by the Engineer:				
5.8.2		Trenching and backfilling for earth mat (200wide X 600deep)	m	30		
5.8.3		70mm square bare copper ground trench earth ring main	m	30		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
5.8.4		70mm square PVC insulated bonding earth conductors	m	15		
5.8.5		Brass earth bushes flush with concrete connected to reinforcing steel in wall or roof	No	4		
5.8.6		25 dia PVC conduit surface or built into brick or concrete wall for earthing wires	m	15		
5.8.7		10 dia solid aluminium roof terminal conductor fixed/saddled to concrete roof	m	25		
5.8.8		Connect to steel handrailing , staircase , doors , crawl beams etc at points indicated by Engineer	No	2		
5.8.9		70/70mm exothermic welds including Denso taping	No	8		
5.8.10		70mm square terminations	No	8		
5.8.11		1-6 to 2 m long earth electrodes (include for connections to earth mat)	No	6		
5.8.12		Test and commission the lightning protection and earthing systems for the pump station sites and the other structures on site/s and issue of the earth test results, compliance certificates and data packs. Include as built layouts.	Sum	1		
5.8.13		Carry out earth resisitivity surveys for the pump station sites and the other structures one site/s and provide results with recommendations for the number and spacings of earth electrodes required	Sum	1		
5.9		**SIGNAGE , EXTINGUISHERS etc**				
5.9.1		Supply and install the following in the MCC and Pump Rooms etc:				
5.9.2		a) Warning electricity danger notices	No	1		
5.9.3		b) No un-authorized entry notices	No	1		
5.9.4		c) Warning - machine starts automatically notices	No	1		
5.9.5		d) 5kg CO2 fire extinguishers with signage	No	1		
5.9.6		Provide labels to the MCCs and other equipment	Sum	1		
5.9.7		Label pumps (number plate type labels)	No	2		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
5.10		**INSTRUMENTATION**				
5.10.1		Supply and deliver the DN200 PN16 Krohne or similar approved mag flow meter (sensor and transmiter) with earthing rings etc as specified with 30m of signal cabling suitable for raw sewage applications (supplier to select correct meter)	Sum	1		Rate Only
5.10.2		Supply and deliver the DN150 PN16 Krohne or similar approved mag flow meter (sensor and transmiter) with earthing as specified with 30m of signal cabling. Suitable for sewage works application	Sum	1		Rate Only
5.10.3		Install , test and commission the above mag flow meter (include for supplier to be in attendance)	Sum	1		Rate Only
5.10.4		Earth the mag flow meter to manufacturer's instructions and connect to the pump station or site wide earth mat	Sum	1		Rate Only
5.10.5		Supply, install and connect up a IP65 enclosure with DC supply surge protection and serial surge protector with DIN rail etc for the flow meter	Sum	1		Rate Only
5.10.6		Supply the IFM or similar approved sewer sump level sensor and remote digital transmitter range 0-10m with signal cable of 15 m between sensor and transmitter as specified or similar and equal aprroved	Sum	1		
5.10.7		Install and connect up the level transmitter supplied above in vandalproof housing	Sum	1		
5.10.8		Install the signal cabling between the sensor and transmitter in sleeves and conduits provided elsewhere	Sum	1		
5.10.9		Supply and install the following electric actuators as specified:				
5.10.10		a) Auma or similar and equal approved electric actuator to fit 100 dia valve as specified	No	1		Rate only
5.10.11		Supply and install the digital instrument panel for the sump level sensors etc as specified (install in pump room etc)	Sum	1		Rate Only
5.11		**INSTRUMENT CABLING** Supply and install the following instrument cabling and terminations. Ethernet cables to be CAT6E industrial grade ethernet cables. Cable ends to include cable numbering etc (FOR RATES ONLY)				
5.11.1		a) 1.0mm² twisted pair 6 core cable	m	10		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
5.11.2		b) 1.0mm² twisted pair 6 core terminations	m	1		Rate Only
5.11.3		e) Fibre optic cabling 4 Core single mode	m	1		Rate Only
5.11.4		f) Fibre optic cabling termination	No	1		Rate Only
5.11.5		g) Dekabond cabling	m	1		Rate Only
5.11.6		h) Dekabond terminations	No	1		Rate Only
5.11.7		I) Modbus cabling	m	1		Rate Only
5.11.8		m) Modbus terminations	No	1		Rate Only
5.11.9		n) Cable basket 150mm heavy duty	m	2		Rate Only
5.11.10		Earth the completed electrical installation in accordance with SANS10142 for all the pump station buildings on the different site/s	Sum	1		Rate Only
5.11.11		Provide test equipment, test and commission the entire electrical installation for the pump stations and sumps including hand-over (include to provide all test and commissioning reports)	Sum	1		
5.11.12		Supply the electrical certificate of compliance (COC) for the pump station and sewer sumps sites and for all structures on site and MCCs (separate COC for each site or DB)	Sum	1		
5.11.13		Assist with testing and commissioning of the pumps/pumping system including telemetry system for the pump station	Sum	1		
5.11.14		Provide 4 sets of the O & M manuals in hard copies and soft copies of all O & M manuals ,operating and maintenance manuals/instructions , hand over data packs etc complete for all MCCs , electrical equipment , instrumentation etc complete for the pump station site (include for mechanical equipment and pumping plant)	Sum	1		
5.11.15		Allow a sum to provide MCC designs, GA and wiring diagrams , componenet lists , P & IDs,,cable block and loop diagrams, instrument block and loop diagrams , I/O lists , process control network diagrans , cable routes , data packs and all other information as specified and requested for the pump station and associated structures (include to up-date to as-builts)	Sum	1		
5.11.16		Allow a provisional sum of R 65 000.00 for any unforseen work to be used entirely at the discretion of the Engineer or Client	Sum	1		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
5.12		**TELEMETRY , SECURITY & INTRUDER ALARM** Supply , install , test and commission the following complete as for telemeytry equipment and systems supplied by Remote Monitoring & Control In Durban : Site 2 - Beta Meta Pump Station 2				
5.12.1		GSM equipment with SIM & data contract for 24 months for 1 site	Sum	1		Rate Only
5.12.2		Complete telemetry panel (with PSU/MCC surge protection/terminals / battery & charger / consumables etc complete) for 1 site as provisional sum allowance	Prov Sum	1		Rate Only
5.12.3		Mimic displays for 1 x level and dislay with LEDs for the 1 pump stations status - Site 2	Sum	1		Rate Only
5.12.4		Installation of telemetry equipment including 30m of siganal and instrument cabling for the pump station site	Sum	1		Rate Only
5.12.5		Pump Room / MCC Room PIR motion sensor with control panel , alarm beacon siren , keypad , conduit , wiring , integration into telemery panel etc complete for the pump station site	Sum	1		Rate Only
5.12.6		Allow an amount for all the engineering , layouts, wiring diagrams etc for all the pump station site	Sum	1		
5.12.7		Test and commission the telemetry and intruder & security systems for the pump station 2 site	Sum	1		
5.12.8		Allow an amount to train the Client's operations and maintenace personnel for the pump station	Sum	1		
5.12.9		Allow an amount to provide the O & M manuals, as builts , hand-over data packs, compliance certificates , wiring diagrams etc complete	Sum	1		
TOTAL CARRIED FORWARD						

SECTION C4 ELECTRICAL AND INSTRUMENTATION INSTALLATION

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
5.12.10		Supply and install Luft or similar approved extract fan type LPA500/43F , 1350 rpm 0,37kW 1,3A with WC500 cowl and insect screen including wall openings etc complete	No	1		
5.12.11		Communicating and liasing with Eskom or the Municipality Electricity supply authority for the power supply and switch-on to all the site/s including submitting all documents required	Sum	1		
5.12.12		Provide training to the Client's operations and maintenance personnel on the MCCs , controls, instrumentation and PLC/HMI etc for the complete works for the site/s (Include training for 4 people)	Sum	1		
5.12.13		Allow an amout of R 55 000,00 for the Engineer to attend MCC FATs and for travel costs to site etc. Include for profit and attendance. (To be paid directly to Engineer prior to work being done)	Prov. Sum	1	R55 000,00	R55 000,00
5.12.14		Allow for profit and attendance on item 2.33 above	%	R55 000,00		
5.12.15		Allow a provisional sum of R 100 000,00 for the Eskom or Municipality power supply upgrade or new supplies to the pump station site (note that this amount is an estimate only, the final amount will depend on the quote received after application)		1	R100 000,00	R100 000,00
5.12.16		Allow for profit and attendance on item 2.35 above	%	R100 000,00		
TOTAL CARRIED FORWARD TO SUMMARY						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
6		**SECTION C5: BETA GUARDHOUSE** Construct a guard house measuring 4.5 m (L) × 2.2 m (W) × 2.44 m (H) with external walls built using 230 mm thick brickwork, including a toilet room of 1.2 m × 2.2 m formed with 110 mm thick internal brick partition walls, and complete all work in accordance with the project specifications.				
6.1	**SANS 1200C**	Site Clearance				
6.1.1	**8.2.1**	Clear and grub of strips (where not cleared within other clear and grub areas)	m2	28		
6.1.2	**8.2.1**	Remove topsoil to nominal depth of 150mm, stockpile	m3	4,5		
6.2		**Bulk excavation**	m3	8		
	PSD 8.3.2 a)	Excavate in all materials and use for embankment or backfill or dispose as ordered from				
6.2.1		a) Necessary excavations	m3	3		
		Extra-over for:				
6.2.2	**8.3.2 b)**	Intermediate excavation	m3	3		
6.2.3	**8.3.2 b)**	Hard rock excavations	m3	3		
6.3	**SANS 1200 D 8.3.3 a)**	**Restricted excavation:** Excavate for restricted foundations, footings and pipe trenches in all materials and use for backfilling or embankment or dispose:				
6.3.1		a) To bottom of blinding layer	m3	1		
6.3.2		b) Inlet and outlet pipe	m3	4		
		Extra-over for:				
6.3.3		1. Intermediate excavation	m3	3		
6.3.4		2. Hard rock excavation	m3	3		
6.3.5		3. Hand excavation and backfill only where ordered by the Engineer "	m3	2		
6.4		**Dealing with water (Including the continual dewatering of foundations for the encountering of ground water and stormwater)**	sum	1		
6.5		**Safeguard the bulk excavation and maintain for the construction period until the backfill is complete**	sum	1		
		Earth filling supplied by the contractor, compacted to 93% Mod. AASHTO density unless otherwise described: To trenches and under solid floors, steps, etc.	m3	2		
		Soil poisoning and protection against termites. Chlordane or Aldrin or similar type termite soil insecticide applied by the contractor and mixed and applied in the presence of the engineer. : Under solid floors etc. including forming and poisoning shallow furrows against walls, etc and filling in furrows and ramming.	m2	10		
6.6		**CONCRETE**				
	SANS1200G	SCHEDULED FORMWORK ITEMS				
	8.2.3	Narrow widths (up to 300mm wide):				
6.6.1		To sides of floor slabs	m2	6		
6.7	**8.2.4**	**Box out holes and form voids:** Small, circular of Diameter up to and including 0,35 m:				
6.7.1		Over 0 m deep up to 0,5m deep	No	1		
		PRE-CAST CONCRETE				
		Standard pre-stressed fabricated lintels including min. 300mm bedding bearing ends on both sides in 'Buildcrete' cement mortar and propping as necessary:				
		i)103 x 110mm Lintels x 1200mm long over door frames	no	2		
		iii) 103 x 110mm Lintels x 2400mm long over windows and vranda	no	2		
		iv) 140 x 110mm Lintels x 900mm long over window	no	1		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
6.8		**SCHEDULED REINFORCEMENT ITEMS**				
	8.1.2.3a)	Mild steel bars				
6.8.1		All sizes	t	0,5		
	8.1.2.3a)	High-tensile steel bars				
6.8.2		All sizes	t	0,5		
		High-tensile welded mesh				
6.8.3		(a) Reference 395	m2	8		
6.8.4		(b) Reference 617	m2	0		
6.8.5		(c) Reference 888	m2	0		
6.9		**Strength concrete 15 MPa/19mm**				
6.9.1	**8.4.2**	(a) Blinding layer in 50 mm thickness	m3	0,5		
6.10		**Strength concrete 20 MPa/19mm**				
6.10.1	**PA 8.2.3**	a) Screed to Floor Slab	m2	3		
6.11		**Strength concrete 25 MPa/19 mm**				
6.11.1	**8.4.3**	(a) Apron slab	m3	2		
6.12		**Strength concrete 30 MPa/19 mm**				
6.12.1		(a) In strip footings	m3	4		
6.12.2		(b) In floor slabs	m3	2		
6.13		**Test blocks**				
6.13.1		Making and testing 150 × 150 × 150mm concrete strength test cubes	Prov sum	1	10 000,00	R10 000,00
6.13.2		Overheads, charges and profit on item 8.14.1 above	%	R10 000,00		
6.14		**Unformed surface finishes:**				
	PSG 5.5.10.4	Wood-floated finish				
6.14.1		a) Upper surface floor slab (screed)	m2	10		
	8.4.4	Steel-floated finish				
6.15.3		(a) To top of floor slab	m2	10		
6.15.4						
6.16		**BRICKWORK**				
	PA 8.2.1	Build the following brickwork according to the drawings and specifications including joints, brick force, etc.: brick force after every 3 course				
6.16.1		230mm Brickwork to exterior/interior walls with both faces in semi-face brick Bonny Burn" FBA in stretcher bond"	m2	35		
6.16.2		115mm Brickwork to exterior/interior walls with both faces in semi-face brick Bonny Burn" FBA in stretcher bond"	m2	5		
6.16.3		230mm Damp proofing laid horizontally under windowsills	m	8		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
6.18		**PLUMBING**				
6.18.1		Complete installation of gravity sewer from newly constructed guardhouse to existing inlet works. Rate to including the removal of existing paving, trenching, bedding, 160mm uPVC class 34, backfilling, repair of paving to original condition as well as connecting to existing inlet works.	m	10		
6.18.2		PLUMBING Replacement of the following items relating to plumbing.				
6.18.3		Toilet (complete with cistern)	No	2		
		0.6mm Aloe Green' IBR roof sheeting with 15deg.	m2	18		
6.19.1		Roof and wall insulation. 'Sisalation 405 Multi Purpose' or similar approved insulation, suspended on 2mm galvanised wires, fixed to purlins @ 300mm c/c:	m2	18		
6.19.2		462mm Girth aluminium ridge flashing to match roof sheeting as per manufactures specificationand detail complete	m	6		
6.19.3		Alluminium ogee gutter	m	12		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
6.20		**CARPENRTY AND JOINERY**				
		Engineer Certified, designed and analysed, pre-fabricated roof construction. Plate nailed timber roof truss construction, formed of CCA treated sawn softwood, with patented galvanised plate nailed connections, fixed in position:				
		Roof construction to Gable roof according to detail drawings, including all trusses, TECO Products or similar approved , Bracing & Runners. (wall plates & purlins elsewhere).				
6.20.1		38 x 114mm Wall plate	m	10		
6.20.2		114 x 38 mm rafters spaed at max 600 cc	m	30		
6.20.3		38 x 76m Purlins including fixing to trusses using hurricane clips.	m	48		
6.20.4		Tilter batten planed from 50 x 75mm Purlin including fixing to trusses using hurricane clips.	m	11		
6.20.5		Fascias, bargeboards and other fibre cement products. 80x225mm Tempered bargeboard, including fixing to roof gable end.	m	12		
6.20.6		225x15mm Tempered fascia, fixed to tilter batten.	m	21		
6.21		**CEILINGS**				
6.21.1		4mm Nutec or similar approved ceiling board, fixed to 38x38mm battens at max. 400mm c/c. Rate to include battens.	m2	18		
6.21.2		Extra over ceiling and brandering for 600 x 600mm trap door and frame and H-profile grid fitted flush in opening including any additional brandering	no	2		
6.21.3		75mm Coved Nu-cornice or similar approved applied to manufacturer's specifications.	m	30		
6.22		**DOORS**				
6.22.1		Solid Meranti FL doors: 40x813x2032mm high door hung to steel frame, including Solid Blesbok 460/312/E41or similar approved 3-lever lockset.(Door - D2)	no	1		
6.22.2		Door Aluminium Ib Solid Brz 890 Right (DOOR-D1)	no	1		
6.23		**TILLING** Tiling Prepare floor surfaces and lay floor tile in accordance with suppliers specification.				
6.23.1		400 x 400mm Johnson or similar approved ceramic tiles fixed with adhesive and with 8mm joints in both directions and flush pointed with tinted waterproof jointing compound and sealed as per manufacturer's specifications (colour to be confirmed by client or client's agent) on floor	m2	10		
6.24		**METALWORK**				
6.24.1		Alluminium window units as per approved system, complete with subframes, ironmongery, glass, sealing, etc and fixing to brickwork or concrete				
		Approximately 1500 x 1200 Aluminium winodw 26mm Case Brz ptt1512	no	1		
6.24.2		Aluminum window value range bronze obscure glass top hung PT66 1 vent W600MM x H600MM	no	1		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
6.24		ELECRICAL WORKS				
6.24.1		Electrical installation certified by a registered Electrician. All of the following items are to include for all supply, chasing, conduiting, draw wires, wiring, installation and testing, including DB				
		Main electrical supply to the guardhouse	m	200		
		Plugs etc.				
6.24.2		Std 15A Double wall plug.	No	1		
6.24.3		Other connection points and switchgear	No	2		
6.24.4		Ceiling light point.	No	2		
6.24.5		Light switch - 2 lever	No	2		
6.24.6		Exterior light point	No	1		
		Light fittings - Supply and fit:				
6.24.7		Exterior wall light - 'Beka' 31007 BULKHEAD LED7 LED 7/2.4W – 1142 or similar approved LED Bulkhead with metal body and cover.	No	2		
6.25		**PLUMBING**				
6.25.1		Complete installation of gravity sewer from refurbished guardhouse to existing inlet manhole to Hoof Pump station. Rate to including the removal of existing paving, trenching, bedding, 160mm uPVC class 34 (10m), backfilling, repair of paving to original condition as well as connecting to existing inlet works.	Sum	1		
		Replacement of the following items relating to plumbing.				
6.25.2		Water Closet (WC) Pans Glazed Ceramic (SANS 497)	No	1		
6.25.3		Ceramic Flushing Unit (SANS 1509)	No	1		
6.25.4		Hand Wash Basin (complete unit with mixer taps included (Metallic SANS 226)	sum	1		
6.25.5		a) Cistern-pan connection (Flush pipe)	No.	1		
6.25.6		b) Flexible cistern tank supply connection 20X20mm pipe.	No.	1		
6.25.7		c) Rubber cone for flush pipe (black)	No.	1		
6.25.8		Repair of toilet outflow pipework.	sum	1		
6.25.9		HDPE compression fittings as per SANS 14236	No.	1		
6.25.10		High Density Polyethylene Pipes SANS ISO 4427 Class PN16,PE100,SD11)	m	10		
6.25.11		15mm Ball Valve (Metallic SANS 1056-3)	No.	3		
TOTAL CARRIED FORWARD TOT SUMMARY						

NAME OF CLIENT: DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY
CONTRACT NO. T14/2026
PROJECT DESCR. APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS

SECTION C6 BETA SEWER PUMP STATION ACCESS ROAD

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
7		**SECTION C6 : BETA SEWER PUMP STATION ACCESS ROAD**				
7.1		**CLEARING AND GRUBBING**				
		Clearing:				
7.1.1		Clearing with machines and some hand labour where necessary	ha	0,05		
		Grubbing:				
7.1.2		Grubbing with machines and some hand labour where necessary	ha	0,05		
		Removal and grubbing of large trees and tree stumps:				
7.1.3		Girth equal to or exceeding 1,0m up to and inculding 2,0m	No	2		
7.1.4		Girth exceeding 2,0m up to and including 3,0m	No	1		
7.1.5		Girth exceeding 3,0m	No	2		
7.1.6		Removal of trees in forests and plantations	ha	0,5		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.2		**LOADING AND HAULING**				
		Loading:				
7.2.1		Loading from stockpile using machines and some hand labour where necessary	m^3	117		
		Hauling:				
		Hauling material for use in the works and off-loading it on site of the works				
7.2.2		(a) Soil, gravel, crushed stone and Pavement Layer Material	m^3-km	12		
		Hauling material to spoil and off-loading it at a designated spoil area:				
7.2.3		(b) Soil and gravel material	m^3-km	44		
7.2.4		(c) Boulders	m^3-km	3		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.3		**DRAINS** Excavation for open drains: Excavating all material situated within the following depth ranges below the surface level using conventional methods:				
7.3.1		(a) 0 m to 1,5 m	m³	4		
7.3.2		Extra over sub-item C3.1.1.1 for excavation in hard and boulder material, irrespective of depth	m³	0,33		
		Excavation and disposal of material for subsoil drainage systems: Excavating in all material situated within the following depth ranges below the surface:				
7.3.3		(a) 1,5 m to 2,0 m	m³	4		
7.3.4		Extra over sub-item C3.1.4.1 for excavation in hard and boulder material, irrespective of depth	m³	0,4		
		Impermeable backfilling to subsoil drainage systems				
7.3.5		G5 material obtained from commercial sources	m³	0,8		
7.3.6		Extra over items C3.1.5.2 for stabilisation with 4,0 % CEM II (32.5) cement	m³	0,8		
		Natural permeable material in subsoil drainage systems (approved crushed stone):				
7.3.7		Crushed stone obtained from commercial sources (13.5mm)	m³	0,6		
		Natural permeable material in subsoil drainage systems (approved natural sand):				
7.3.8		Natural sand from commercial sources	m³	0,4		
7.3.9		Pipes in subsoil drainage systems:				
7.3.10		U-PVC pipes and fittings, normal duty, complete with couplings (100mm dia. slotted)	m	7		
7.3.11		Geotextiles (Type Kaytech U14 or similar approved)	m²	9		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.4		**CULVERTS**				
		Excavation for culvert structures:				
		Excavating in all material situated within the following depth ranges below the surface level:				
7.4.1		(a) 0 m to 1,5 m	m³	14		
7.4.2		Extra over sub-item C3.2.1.1 for excavation in hard or boulder material, irrespective of depth	m³	2		
		Backfilling:				
7.4.3		Using the excavated material	m³	12		
		Using imported selected material:				
7.4.4		(a) From sources on site (G7 or Better)	m³	105		
7.4.5		(b) From commercial sources (G5)	m³	11		
		Concrete pipe culverts:				
7.4.7		(ii) On Class C bedding (450mm Dia, Spigot and Socket, 75D)	m	10		
		Rectangular culverts with prefabricated elements:				
7.4.8		(i) Prefabricated concrete inlets and outlets to culverts (Kerb Inlet to detail)	No	2		
7.4.9		(ii) Prefabricated concrete inlets and outlets to culverts (Manhole to detail)	No	2		
7.4.10		(iii) Prefabricated concrete inlets and outlets to culverts (Inlet to detail)	No	2		
7.4.11		(iv) Prefabricated concrete inlets and outlets to culverts (Outlet to detail)	No	2		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.5		**BORROW MATERIALS**				
		Removal of the overburden:				
7.5.1		In borrow pits	m	1,5		
		Finishing-off borrow areas in:				
7.5.2		(a) Borrow pit	ha	1,5		
		Providing a crushing and/or screening plant:				
7.5.3		(a) Single-stage crusher with screen.	No	1		
		Producing the material by:				
7.5.4		Single-stage crushing	m^3	40		
7.5.5		Stockpiling of material	m^3	40		
7.5.6		Blasting of material in borrow pit (measured in place).	m^3	40		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.6		**CUT MATERIALS** Excavating of materials in box cuts, material obtained from				
7.6.1		Soft excavation	m³	86		
7.6.2		Boulder excavation class A	m³	3		
7.6.3		Hard excavation (other than by blasting)	m³	6		
7.6.4		Hard excavation (by blasting)	m³	6		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.7		**COMMERCIAL MATERIALS** Commercial material identified by the contractor from commercial, private or other non-commercial suppliers				
7.7.1		(c) Lower selected subgrade layer (G9 Imported - 150mm thk) compacted to 93 % of MDD	m³	55		
7.7.2		(d) Upper selected subgrade layer (G7 Imported - 150mm thk) compacted to 95 % of MDD	m³	55		
7.7.3		(e) Gravel wearing course layer (G5 Natural Gravel or better - 150mm) compacted to 95 % of MDD	m³	55		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.8		**ROADBED** Roadbed construction and compaction				
7.8.1		Compaction of in-situ material to 90 % of MDD (150mm thk)	m^3	117		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.9		**FILL** Fill construction Normal fill material in compacted layer thicknesses of 200 mm and less:				
7.9.1		(a) Compacted to 90 % of MDD	m³	86		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.10		**ROAD PAVEMENT LAYERS**				
7.10.1		Compiling and implementing M&U plans for the construction of all the pavement layers	No	1		
		Construction of pavement layers				
		Construction of layers using conventional construction methods:				
7.10.2		(a) Lower selected subgrade layer (G9 Imported - 150mm thk) compacted to 93 % of MDD	m³	10		
7.10.3		(c) Upper selected subgrade layer (G7 Imported - 150mm thk) compacted to 95 % of MDD	m³	59		
7.10.4		(g) Gravel wearing course layer (G5 Natural Gravel or better - 150mm) compacted to 95 % of MDD	m³	59		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.11		**PITCHING, STONEWORK, CAST IN SITU CONCRETE FOR PROTECTION AGAINST EROSION**				
		Stone pitching				
7.11.1		Grouted stone pitching on a concrete bed	m²	1		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.12		**NON-STRUCTURAL GABIONS** Foundation trench excavation: Excavating all material situated within the following depth ranges below the surface level				
7.12.1		(a) 0 m to 1,5 m	m³	1		
7.12.2		Surface preparation for bedding the gabion boxes and mattresses	m²	1		
		Gabion boxes and mattresses:				
7.12.3		(i) Galvanized gabion boxes, Length 1m, Width 2m, Depth 1m and nominal diameter of mesh wire 2.7mm, mesh size 80mm x 100mm	m³	2,5		
7.12.4		(ii) Galvanized gabion boxes, Length 2.0m, Width 2m, Depth 1m and nominal diameter of mesh wire 2.7mm, mesh size 80mm x 100mm.	m³	2,5		
7.12.5		(i) Galvanized gabion mattresses, Lenght 2m, Width 1m, Depth o.23mm, mesh size 80 x 100mm nominal diameter of mesh size 2,2mm, and 1m diaphragm spacing.	m³	2,5		
7.12.6		Geotextile (kaytech grade A4 or similar).	m²	5		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.13		**ROAD RESTRAINT SYSTEMS** Complete galvanized system compliant to SANS 1350:				
7.13.1		(a) On timber posts (Drawing reference SD1101)	m	10,00		
7.13.2		(d)End treatments where single guardrail sections are specified (Drawing reference SD1102)	No	1,00		
		Extra over for horizontally curved guard rails				
7.13.3		Extra over C11.4.1 for horizontally curved guard rails factory bent to a radius of less than 45 m	m	5,00		
		Additional guardrail posts for 3,81 m systems:				
7.13.4		Timber	No	1,00		
		Reflective plates				
7.13.5		Steel plates	No	2,00		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.14		**ROAD SIGNS** Road signboards with painted or coloured semi-matt background. Symbols, lettering and borders in semi-matt black or in Class I retro-reflective material, where the sign board is constructed from: Prepainted galvanized steel plate:				
7.14.1		(b) Area exceeding 0,5 m2 but not 2,0 m2	m²	1,00		
7.14.2		(c) Area exceeding 2,0 m2 but not 10 m2	m²	2,00		
		Regulatory signs, permanent				
7.14.3		(a) 600 mm diameter (aluminium sheet)	No	1,00		
		Warning signs, permanent				
7.14.4		(a) 600mm size (aluminium sheet)	No	1,00		
		Extra over on item C11.6.1 for using:				
		Background of retro-reflective material:				
7.14.5		(a) Class I	m²	1		
		Lettering, symbols, numbers, arrows, emblems and borders of retro-reflective material:				
7.14.6		(a) Class III	m²	1		
		Road sign supports (overhead road sign structures excluded):				
7.14.7		Timber (150mm diameter)	m	20,00		
		Danger plates at culverts/structures				
7.14.8		Size 150 x 600 mm (timber post and reflective material)	No	1,00		
TOTAL CARRIED FORWARD						

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.15		**FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS**				
		Finishing the road and road reserve:				
7.15.1		Single carriageway road	km	0,06		
TOTAL CARRIED FORWARD						

NAME OF CLIENT: DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY
CONTRACT NO. T14/2026
PROJECT DESCR. APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS

SECTION C6 BETA SEWER PUMP STATION ACCESS ROAD

ITEM NO.	PAYMENT REF.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
TOTAL BROUGHT FORWARD						
7.16		**TESTING MATERIALS AND JUDGEMENT OF WORKMANSHIP**				
7.16.1		(a) Other special tests requested by the Engineer	Prov Sum	1	15 000,00	R15 000,00
7.16.2		(b) Handling cost and profit in respect of sub item B81.02 (a) above	%	R15 000,00		
		Cost of Testing:				
7.16.3		(c) Straight edge, 3m long.	No	2		
TOTAL CARRIED FORWARD TO SUMMARY						

NAME OF CLIENT	**DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY**
CONTRACT NUMBER	**T14/2026**
PROJECT DESCRIPTION	**APPOINTMENT OF A CONTRACTOR FOR THE REFURBISHMENT OF HOOF AND BETA METAL PUMP STATIONS**

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SUB - TOTAL 1		
Plus: Allowances for Contingencies (@ 10%)		
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Plus: Allowance for VAT (@ 15%)		
GRAND TOTAL		

C3 SCOPE OF WORK

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PS.3.6 Site Establishment
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PS.3.8 Management of the Environment
PS.3.9 Abnormal Climatic Conditions
PS.3.10 Drawings of Record

B1 : AMENDMENTS TO THE STANDARD SPECIFICATIONS

PSA GENERAL

B2 : ADDITIONAL PARTICULAR SPECIFICATIONS

PA OHSA 1993 HEALTH AND SAFETY SPECIFICATION
PB ENVIRONMENTAL MANAGEMENT PLAN
PC EPWP REQUIREMENTS

C3.1 STANDARD SPECIFICATIONS

The standard specifications on which this contract is based are the **SABS 1200 Standardized Specifications.**

Although not bound in nor issued with this Document, the following Parts of the SABS 1200 Standardized Specifications shall apply:

SABS 1200 A:	General (1986)
SABS 1200 AB:	Engineers Office (1986)
SABS 1200 C:	Site Clearance (1980)
SABS 1200 D:	Earthworks (1988)
SABS 1200 DB:	Earthworks (Pipe Trenches) (1989)
SABS 1200 DK:	Gabions and Pitching (1996)
SABS 1200DM:	Earthworks (Roads and sub grade) (1981)
SABS 1200 GA:	Concrete (Small Works) (1982)
SABS 1200 L:	Medium-Pressure Pipelines (1983)
SABS 1200 LB:	Bedding (Pipes) (1983)
SABS 1200 LD:	Sewers (1982)
SABS 1200 LE:	Stormwater drainage (1982)
SABS 1200 LF:	Erf Connections (Water) (1983)
SABS 1200ME:	Subbase (1981)
SABS 1200MF:	Base (1981)
SABS 1200 MH:	Asphalt Base and Surfacing (1996)
SABS 1200MM:	Ancillary Roadworks (1984)

Variations and additions to the various SABS 1200 Standardised Specifications are given in Portion B of the Project Specifications

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 SABS) 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.

Other documents:

The latest edition of “Standards and Guidelines” from the National Home Builders Registration Council.

Model Preamble for Trades from the Association of SA Quantity Surveyors

General Conditions of Contract 2015 (third edition, 2015) Obtainable from the SA Association of Consulting Engineers

C3.2 PROJECT SPECIFICATIONS

STATUS

The Project Specification, consisting of two parts, forms an integral part of the contract and supplements the Standard Specifications.

Part A contains a general description of the works, the site and the requirements to be met.

Part B contains variations, amendments and additions to the Standardized Specifications and, if applicable, the Particular Specifications.

In the event of any discrepancy between a part or parts of the Standardized or Particular Specifications and the Project Specification, the Project Specification shall take precedence. In the event of a discrepancy between the Specifications, (including the Project 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.

The standard specifications which form part of this contract have been written to cover all phases of work normally required for road contracts, and they may therefore cover items not applicable to this particular contract.

PART A: GENERAL

PS.1 PROJECT DESCRIPTION

The scope of work set out in this contract is as follows:

1. HOOF PUMP STATION

- Site clearance
- Gravel access road and earthworks
- One (1) New Vehicle access gate and remedial work to existing fence
- Desludging and cleaning of existing sump and inlet channels and new inlet channel screens
- Refurbishment of existing ablution and shower building
- Removal of accumulated sludge, debris, and blockages within the pump station, manholes, and sump.
- Construction of the new pump house
- Construction of the new guard house.
- Provision of inlet works and screens
- Provide One (1) duty pump and One (1) Standby pump including motors
- Supply and install suction, flow meter and delivery steel pipe work fittings.
- Provision for bulk electricity and transformer
- Supply and install MCC panel and cable ducting
- Standby Generator

2. HOOF RAISING MAIN

- Unblocking of existing pipeline
- Safe removal and disposal of asbestos pipes
- Supply and installation of new 400m 310mmØ uPVC sewer pipeline, including all fittings and connections.
- Testing of the new pipeline.
- Backfilling and reinstatement of affected areas.

3. BETA METAL PUMP STATION

- Site clearance
- Gravel access road and earthworks
- Construction of 110m New Clearvu Fence
- Desludging and cleaning of existing sump and inlet channels and new inlet channel screens
- Provisions for Removal of blockages from gravity mains and rising mains
- Repair, replacement, or refurbishment of inlet works screens
- Construction of a new guard house and ablutions
- Construction of the pump house, plinth and structure
- Supply and installation of Two (2) Self priming centrifugal pumps - 1 duty pump and 1 standby pump
- One (1) Pump house building
- One (1) Mechanical and pipework within the proposed pump station
- One (1) Electrical works and bulk electricity connections
- One (1) MCC panel and pump automation
- Standby Generator
- Supply and install suction, flow meter and delivery steel pipe work fittings.

PS.2 DESCRIPTION OF THE SITE AND ACCESS



PS.3 CONSTRUCTION AND MANAGEMENT REQUIREMENTS

PS.3.1 General

The Contractor is referred to SANS 1921: 2004 parts 1, 2 and 3: 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.

PS.3.2 Labour Intensive Competencies of Supervisory and Management Staff

Contractors shall only engage supervisory and management staff in labour intensive works who have either completed, or for the period 1 April 2004 to 30 June 2006, are registered for training towards, the skills programme outlined in Table 1.

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

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 2004 to 30 June 2006 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 2004 to 30 June 2006 be registered on a skills programme for, the NQF level 2 unit standards or NQF level 4 unit standards.

PS.3.3 Employment of Labour

It is the intention that this Contract should make the maximum possible use of the labour force which is at present underemployed.

To this end it will be expected of the Contractor to employ and train labour on this Contract.

The Contractor shall fill in the forms relating to Key Personnel and state how many key personnel he intends to employ in the various categories. The numbers stated in the above

mentioned form will be strictly controlled during the contract period and any increase in numbers shall be subject to the approval of the Engineer.

It is a condition of contract that the data sheets detailing the employment of human resources, expenditure and employment of SMMES as detailed in the tables below be submitted together with the monthly certificate timorously to the Engineer by the 10th of each month.

The definition of youth being determined by age up to and including 35 years.

The unit of measurement is person days being the total number of persons in that category multiplied by the number of days worked by each person respectively.

Labour intensive construction will be used to implement the Works and will include all of the following operations: -

(a) All trenching and backfilling of trenches. Excavation in hard, unpickable material and rock will be done by machine and blasting respectively;

(b) All laying and bedding of pipework. The contractor is required to train local labour in the laying of these pipes;

(c) Bedding, including the short haul by wheel barrow at a maximum distance of **100m**, of imported stockpiles placed alongside the trench;

(d) Construction of manholes, valve chambers, gabion basket filling, erosion protection measures etc;

(e) Manufacturing of pipe route markers on site; and

(f) Steel fixing, shutter hand work and minor concrete works.

Plant may be used to deliver bedding to the trench at **100m** intervals from where labour must be used to load, haul and off-load the material using wheelbarrows. **The use of a machinery for this activity will not be permitted.**

All work to be executed by labour intensive methods will be demarcated as **(LI)** in the bill of quantities. Any work so designated or specified in this specification as being done labour intensively but which is not executed by labour, notwithstanding any payment made to the labour, will not be paid for.

Labour Return : (Current Month)

	Total		Adults				Youth (<35 yrs)				Disabled			
			Women		Men		Female		Male		Female		Male	
	Persons	Person days	Persons	Person days	Persons	Person days	Persons	Person days	Persons	Person days	Persons	Person days	Persons	Person days
Clerical	0	0												
Labourers	0	0												
Managerial	0	0												
Semi-skilled	0	0												
Skilled	0	0												
Supervisor	0	0												
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Expenditure

(All excl VAT)	Previous Total	This Cert	Total to Date
Value paid to locally sourced labour resources			R -
Amount paid for accredited training			R -
Amount paid for non-accredited training			R -

SMME Schedule

Name of SMME	SMME Information		PROJECT Information			
	No of Permanent Employees	Turnover previous 12 months	Total person days to date	Amount paid to SMME	Person days locally sourced	Total value of work

The data sheets must be submitted monthly irrespective of whether or not a payment certificate is submitted in terms of the latest cash flow.

P.S.3.3.1 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.

P.S.3.3.2 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.

P.S.3.3.3 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.

P.S.3.3.4 Terms of Work

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

P.S.3.3.5 Normal Hours of Work

(a) 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.
(b) 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.
(c) 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.

P.S.3.3.6 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.

P.S.3.3.6 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.

P.S.3.3.7 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.

P.S.3.3.8 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”).

P.S.3.3.9 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 sick leave.
(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.

P.S.3.3.10 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 –

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

P.S.3.3.11 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.

P.S.3.3.12 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.

P.S.3.3.13 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 completion of the EPWP.

P.S.3.3.14 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 of R150.00 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.

P.S.3.3.15 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.

P.S.3.3.16 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 behavior by another person to their employer or manager.

P.S.3.3.17 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.

P.S.3.3.18 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. However, the worker may be re-engaged if a position becomes available.
(e) 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.

P.S.3.3.19 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.

P.S.3.3.20 Contractor's default in payment to Labourers and Employees

(a) Any dispute between the Contractor and labourers, regarding delayed payment or default in payment of fair wages, if not resolved immediately may compel the Employer to intervene.
(b) The Employer may, upon the Contractor defaulting payment, pay the moneys due to the workers not honoured in time, out of any moneys due or which may become due to the Contractor under the Contract.

P.S.3.3.21 Provision of Handtools

(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

P.S.3.3.22 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
Progress report detailing production output compared to the programme of works

P.S.3.3.23 Labour-intensive works

Labour-intensive works comprise the activities such as those 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.

PS.3.4 Construction Programme

(a) Preliminary Programme

The Contractor shall include with his tender a preliminary programme on the prescribed form to be completed by all Tenderers. The programme shall be in the form of a simplified bar chart with sufficient details to show clearly how the works will be performed within the time for completion as stated in the Contract Data.

Tenderers may submit tenders for an alternative Time for Completion in addition to a tender based on the specified Time for Completion. Each such alternative tender shall include a preliminary programme similar to the programme above for the execution of the works, and shall motivate his proposal clearly by stating all the financial implications of the alternative completion time.

The Contractor shall be deemed to have allowed fully in his tendered rates and prices as well as in his programme for all possible delays due to normal adverse weather conditions and special non-working days as specified in the Special Conditions of Contract, in the Project Specifications and in the Contract Data.

(b) Programme in terms of Clause 5.6 of the General Conditions of Contract

It is essential that the construction programme, which shall conform in all respects to Clause 5.6 of the General Conditions of Contract, be furnished within the time stated in the Contract Data. The preliminary programme to be submitted with the tender shall be used as basis for this programme. The Contractor's attention is also drawn to clause 5.7 of the General Conditions of Contract 2015.

PS.3.5 Drawings *(Read with SANS 1921 – 1: 2004 clauses 4.1.7; 4.1.11 and 4.1.12)*

The reduced drawings which form part of the tender documents shall be used for tendering purposes only.

The contractor shall be supplied with three complete paper copies of the construction drawings free of charge. The Contractor shall at his own expense produce there from 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 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.

PS.3.6 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.

PS.3.7 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.

PS.3.8 Blasting

No blasting shall be carried out for the execution of the Works without the prior consent of the Engineer. This consent will not be given where in the opinion of the Engineer blasting may give rise to unnecessary risk of damage to surrounding property and other means of excavation are available to the Contractor. Where consent to blasting is given such consent shall in no way relieve the Contractor of any of his liabilities under the Contract.

No blasting will be permitted within 10 m of any structure, pipeline or service unless the Contractor can satisfy the Engineer that his proposed blasting methods and controls are such that no damage will be caused to the adjoining structure, pipeline or service. The Engineer may then ask for vibro-readings to be taken at no additional cost to the Employer. No blasting is to be carried out in Eskom, Telkom or other servitudes or way leaves unless the relevant authorities have been advised in writing three weeks prior to blasting. Where blasting is carried out the Contractor shall arrange for a representative of the relevant authority to be present prior to and during the blast.

The Contractor shall conform to all Government regulations in regard to blasting, handling and storage of explosives.

PS.3.9 Spoil Sites *(Read with SANS 1921 - 1 : 2004 clause 4.10)*

The spoil sites shall be determined on site in conjunction with the Engineer. The Contractor shall be permitted to use only those spoil areas approved by the Engineer.

Should the Contractor wish to use any other tip area for the disposal of soil, rubble, vegetation, etc, its use shall be subject to the approval of the Engineer.

PS.3.10 Testing *(Read with SANS 1921 – 1 : 2004 clause 4.11)*

(a) 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.

(b) 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.

PS.3.11 Site Establishment *(Read with SANS 1921 - 1 : 2004 clause 4.14)*

This contract is to be executed in an area surrounded rural settlements and as such safety will be paramount. Furthermore, all due courtesy must be exercised in so far as local resources are concerned (labour and materials).

The Engineer will facilitate all communication with the tribal authority.

(a) Water and Electricity

The Contractor is to make his own arrangements in this regard and should note that the Employer shall not be held responsible for any shortages of either water or power due to unforeseen circumstances.

Water will be made available for hydraulic testing purposes only. All other water required for construction purposes is to be sourced by the Contractor and is to be allowed for in his rates.

(b) Location of Site Office

A suitable site will be indicated at the Site Inspection. The contractor will need to allow for the fencing of the site.

Watchmen only may be housed on site.

The contractor is to provide adequate sanitary and waste facilities for his staff and is to ensure that the camp is kept clean and neat at all times. No littering is to take place at either the camp or on the site.

The site is to be left in a neat, landscaped condition without any improvements on completion of the contract and final retention will not be released until such time as this condition has been complied with.

(c) Telephone

The contractor shall make his own arrangements in this regard. Cellular phone coverage is available in the area as are the normal land line facilities provided by Telkom.

PS.3.12 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 bench-marks, stand boundary pegs and survey 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.

PS.3.13 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.

No work may proceed on road crossings under the provincial main roads until the necessary approvals are in place as confirmed by the Engineer. All work within the road reserve shall comply with the specifications of the Provincial Department of Transport as will be issued to the Contractor by the Engineer.

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.

Prior to commencing construction activities in a particular area, the Contractor shall also diligently enquire of local landowners as to whether there are any other known services which have not been shown on the drawings but which may be affected by the construction activities in that area, and any such services shall be brought to the attention of the Engineer immediately. The Contractor shall take note of the requirements of clause 1202 of the standard specifications with regard to services.

PS.3.14 Health and Safety (*Read with SANS 1921 - 1: 2004 clause 4.18)*

It is a requirement of this contract that the Contractor shall provide a safe and healthy working environment and to direct all his activities in such a manner that his employees and any other persons, who may be directly affected by his activities, are not exposed to hazards to their health and safety. To this end the Contractor shall assume full responsibility to conform to all the provisions of the Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the OHSA 1993 Construction Regulations 2003 issued on 18 July 2003 by the Department of Labour.

For the purpose of this contract the Contractor is required to confirm his status as mandatory and employer in his own right for the execution of the contract by entering into an agreement with the Employer in terms of the Occupational Health and Safety Act in the form as included in section C1.2.2

The rates and prices tendered by the Contractor shall be deemed to include all costs for conforming to the requirements of the Act, the Construction Regulations and the Employer's Health and Safety Specification as applicable to this contract.

Should the Contractor fail to comply with the provisions of the Construction Regulations, he will be liable for penalties as provided in the Construction Regulations and in the Employer's Health and Safety Specification.

The Contractor’s failure to comply will also be recorded on the Municipal data base and will affect the award of adjudication points to the Contractor on future work tendered for.

PS.3.15 Requirements for Accommodation of Traffic (Read with SANS 1921 - 2 : 2004)

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.

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.

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.

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.

The Contractor's tendered rates for the relevant items in the Bill of Quantities shall include full compensation for all possible additional costs which may arise from this, and no claims for extra payment due to inconvenience as a result of the modus operandi will be considered.

PS.3.16 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:

(a) 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.

(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.

(c) Environmental Management Plan

In addition to the above, all requirements of the Environmental Management Plan (EMP) as

detailed in the Particular Specifications, will be adhered to.
Failure to adhere to the EMP in all respects will be recorded on the Municipal database and will affect the award of adjudication points to the Contractor on future work tendered for.

PS.3.17 Abnormal Climatic Conditions

No extension of time for completion shall be granted for normal rainfall but extension of time shall be determined for abnormal rainfall or wet conditions in accordance with the formula given below separately for each calendar month or part thereof. It shall be calculated for the full period for completion of the contract plus any granted extension thereof:

V = (Nw –Nn) Rw/Rn ……..if (Nw – Nn)>0

The symbols have the following meanings respectively:

V = Extension of time in calendar days is respect of the calendar month under consideration.
Nw = Actual number of days during the calendar month on which a rainfall of 10mm or more is recorded.
Nn = Average number of days, as derived from existing rainfall records, on which a rainfall of 10mm or more has been recorded for the calendar month
Rw = Actual rainfall recorded for the calendar month.
Rn = Average rainfall for the calendar month under consideration as determined from existing rainfall records.

When calculating the extension of time for a part of a month pro rata values of Rn and Nn shall be used.

The factor Rw/Rn shall be deemed to be fair allowance for days on which wet conditions disrupted or prevented work but on which a rainfall of 10mm or more was not recorded. If the value of Rw/Rn exceeds 2,5 it shall be taken as 2,5.

If Nw for any month is smaller than Nn the formula to be used shall be:

$V^1 = (Nn – Nw)$

The total extension of time for completion shall be the sum of the values of

V minus the sum of the values of V^1.

Total extension of time = $V-V^1$.

The following are the most reliable values of Nn and Rn available and shall be used unless other values are mutually agreed upon beforehand:

Source of information : Weather Beureau, Department of Transport

Rainfall Station : Mahlabatini

Period : 1932 – 1940

Month	Nn	Rn
January	3	121.7
February	2	103.7
March	2	92.0
April	1	49.4
May	0	24.6
June	0	14.0
July	0	16.8
August	0	18.9
September	1	47.3
October	3	88.4
November	3	112.0
December	3	117.4

Rainfall gauging will be taken and recorded by the Contractor at his Site Office and agreed with the Engineer on a daily basis.

b) Should an extension of time be granted by the Engineer the Contractor shall be reimbursed for his time related Preliminary and General items contained in the schedule of Quantities. The amount of reimbursement shall be calculated as follows:

$$\frac{\text{No of days extension of time granted}}{\text{Total number of working days in the Contract}} \times \text{Total for time related P\&Gs}$$

PS.3.18 Drawings of Record

Any information in the possession of the Contractor, which is necessary for the Engineer's Representative to complete his "drawings of record", must be submitted to the Engineer's Representative before a final payment certificate and a certificate of completion will be issued.

Included in the information to be provided by the contractor shall be the co-ordinated position of all above ground visible features including:

a) Manholes;
b) Valve positions including air, isolating valves and scour valves; and
c) All change of direction in the pipe alignment including tees.

PS. 4 PROJECT REQUIREMENTS

PS4.1 SITE CLEARANCE , EXCAVATION AND FREE-HAUL

Top soil and other removed material shall be placed within the site boundaries, at a place indicated by the Local Authority in writing. In the case where the Local Authority requires disposing of material further away from the site, the Employer's approval shall first be obtained and Local Authority shall be consulted and approval in writing obtained to use the designated dumping place. The same applies for borrow areas outside the site boundaries. Normal regulations regarding safety, municipal by-laws, contamination of water sources, erosion, siltation etc. shall apply.

The free-haul distance shall be the entire site of works, for each project.

The contractor shall not incur any overhaul or "extra over" expenses without the written approval of the Engineer.

The overhaul distance shall be defined as the truck-haul distance measured to the nearest 0,5 km from the end of the free-haul to the disposal / borrow pit area, by the shortest practical route and shall be measured in one direction only.

No additional payment will be made for provision of access to the sites.

PS 4.2 CUT AND FILL FOR BUILDING PLATFORMS

Buildings shall be constructed completely in cut, with a minimum underfloor backfill. Should the contractor wish to construct on fill, he shall allow at his own cost, for longer columns and higher foundation walls to allow for **founding on in-situ material**. Access and ease of access into the building for the intended use shall remain unaltered. The Contractor shall arrange independent compaction tests, before any building is taking place, at his own cost. Building work shall be removed if there is any doubt whatsoever regarding the compaction. At least 3 evenly distributed places per site shall be tested, once off, after completion of the platform or infill. Water for compaction shall be provided by the Contractor at his own cost.

PS 4.3 COMPACTION OF UNDER FLOOR FILL

All top soil, unsuitable material and vegetation shall be removed from the building area. Suitable non-cohesive, granular backfill material shall be compacted in thin, even layers of thickness relevant to the method/machinery used, at OMC to a minimum of 95 % of Mod. AASHTO maximum density. The contractor shall only import material if absolutely necessary. He shall obtain approval from the borrow pit owner in writing before using it, or obtain mining rights where applicable. Water for compaction, shall be supplied by the Contractor, at his own cost.

PS 4.4 EXISTING SERVICES

The Contractor shall contact the Engineer immediately if he discovers existing services that are in the way of the works, so that it can be avoided if at all possible. If existing services are damaged, the Contractor shall repair it as a matter of urgency at the indicated rate, even if it costs significantly more. He will not receive additional compensation in such case.

PS 4.6 WATER SUPPLY PIPE

Only SABS approved HDPE and uPVC pipe to be used. Trench depth to be determined to allow for bedding where required and 1800 mm cover for bulk. Grading of the trench shall be as such that the pipe will have no local high points between air valves/outlets, in other words, must rise continuously from the lowest points to the air valves/outlets. The Contractor shall use a dumpy level to verify this and to locate the air valves. The same applies for scour valves but obviously

the other way round. The trench "pegging" cost shall be included under the excavation cost. Long sections may be provided by the Engineer or Employer as a guide only. Trenching, bedding and selected fill as per SABS 1200 DB and LB. The trench width for pipe diameters of 300 mm and less shall be minimum pipe diameter plus 500mm (250 mm side allowance) to allow adequate working space for proper jointing and laying of pipe, but shall not be wider than pipe diameter plus 600 mm

PS 4.8 CONCRETE AND FLOORS

Water for building purposes and for the Contractor's use, shall be supplied by the Contractor, at his own cost.

Cement shall be OPC and shall conform to SABS 471. A blended mix with up to 25% PFA shall only be used following the written approval of the Engineer. Cement used shall not be older than 3 months for reinforced concrete works and older than 6 months for mass concrete. The slump of concrete mixes shall be 30- 80 mm. Curing shall take place for at least 7 days or as specified. Concrete shall be adequately compacted/vibrated but separation of material must be avoided. For structural concrete, refer to the detailed specifications on the plans regarding slump, curing, removal of formwork etc.

Floors and walls shall be constructed as such that water will not reach or stand in the passages/walkways or anywhere on the floor. Water shall also not reach or stand against any of the inside walls. Where openings are to be made to drain water, it shall be as such that it will not block, but at the same time it shall be rodent proof.

Keyed construction joints shall be placed as such that it will not be underneath walls. Where it has to cross walls perpendicularly, construction joints shall also be provided in the walls. Keyed construction joints shall be made around supports, to join construction joints in the floors.

Foundations

All foundations for buildings shall be minimum 300 mm deep and 500 mm wide regardless of detail provided on plans.

Light reinforcement shall be placed in foundations comprising three Y12 rods 75 mm from the trench bottom and 100 mm from the sides with the third rod in the bottom middle. The main reinforcement shall be held firmly in place by 75 mm concrete spacers attached to the rods with binding wire. R8 distribution steel, crossing each outer main steel member by 30 mm, thus 360 mm long for a 500 wide foundation, shall be tied to the main steel at 500 mm intervals.

Minimum overlap shall be 600mm. Hooks shall be provided at corners and intersections with walls, with minimum hook length 600 mm. The Engineer shall be consulted for further detail. Work shall not be accepted where the Engineer has not approved the reinforcement prior to concreting.

Wood floated finish

The surface shall only be wood floated sufficiently to produce a uniform surface free from screed or towel marks and shall conform with SABS 1200 G.

Steel-floated finish

The moisture film shall be allowed to harden sufficiently to prevent laitance from being worked to the surface. Where steel floating with a non-slip surface is specified, the surface shall still be

smooth after making it non-slip and shall not be abrasive at all. Under no circumstances may a cement slush be used during the floating process.

Casting of concrete

No concrete shall be cast without the prior inspection of preparation work by the Engineer (except for thrust blocks)

PS 4.9 BLOCK AND BRICK WORK

The strength of blocks shall be not less than 3,5 MPa for hollow units and 7 MPa for solid units. Only SABS approved blocks shall be allowed.

Blockwork shall comply with the standards as set out in the “Standards and Guidelines” manual of the NHBRC. Stretcher bond with 10-15 mm final bed joint thickness and 5 to 20 mm vertical joint thickness shall be used. The mortar bedding shall be full in the case of hollow blocks for the foundation layers and DPC courses. Joints shall be finished flush. Hollow units to be filled with concrete around door frames. Where internal walls are jointed flush with outside walls, wall ties shall be used as per specification in the above named manuals. Corners shall be constructed using the raking back (stepped) method and shall be fully bonded.

Light reinforcement shall be placed in the brick/blockwork over and above the normal brick force regardless of detail on plans. The reinforcement shall comprise R6 rods, overlapping minimum 300 mm and bend around corners with minimum hook length 300 mm. The reinforcement shall not cross expansion joints. Two rods shall be placed per layer, each 30 mm from the inside and outside face of the wall respectively, for three layers immediately above DPC and window/door level. Rods shall be provided with hooks at doors, expansion joints and openings. Full mortar cover shall be provided.

Controlled expansion joints in the walls, with concertina ties at 400 mm vertical spacing, shall be provided at maximum 8 m spacing regardless of detail provided on plans. The joints shall coincide with controlled expansion joint through the concrete roof.

The joints in the roof slabs shall comprise 1000 mm long Y12 rods in the center of the slab at 200 mm intervals, 500 mm into each slab. A 600 mm long elastic plastic pipe of good fit shall be fitted on one side and sealed at the end. The other end shall penetrate the adjoining slab by 100 mm. Work shall not be accepted where the Engineer has not approved the reinforcement prior to concreting. The joints shall be formed with 10 mm bitumen impregnated soft board and shall be sealed water tight both sides with an approved elastic sealant.

PS 4.11 PAINTWORK

The final colour shall be agreed upon between the contractor and the participants of the specific project. Refer to paint specifications on the plans

PS 4: 12 COMMISSIONING AND ACCEPTANCE

The Contractor shall be responsible to commission all equipment and put in readiness for use.

The hand over/acceptance of equipment shall be preceded by a forty-eight (48) hour trail run (where applicable) by the Contractor to enable him to prove to the Engineer that all equipment and plant as a whole perform to requirements.

Where after the equipment shall be run by the Contractor as directed by the Engineer for a further period of approx five (5) days during which thorough inspection, testing, etc of all equipment will take place to be evaluated for acceptance by the Engineer. The Contractor shall schedule this period such as to allow himself enough time to remedy, replace etc unsatisfactory work, equipment etc and still meet the final completion date.
Costs incurred by the Engineer for all unsuccessful acceptance tests will be borne by the Contractor.

When the Contractor has completed all work and the plant subsequently performs to the requirements, then the contractor shall supply all manuals and drawings as called for. Thereupon a certificate of commissioning will be issued and a portion of the retention released. The guarantee period then commences.

PS 4:19 FINAL COMPLETION DATE

On final completion all work in terms of the contract shall be completed. A certificate of completion will be issued.

PS 4:20 MAINTENANCE OBLIGATIONS

The Contractor shall maintain all equipment provided in a good working order during the defects liability period.

The defects liability period shall commence on the day following final completion.

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

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

PART B: AMENDMENTS TO THE STANDARD SPECIFICATIONS AND OTHER ADDITIONAL SPECIFICATIONS

INTRODUCTION

In certain clauses in the Standard Specifications, allowance is made for a choice to be specified in the project specifications between alternative materials or methods of construction, and for additional requirements to be specified to suit a particular contract.

Details of such alternative or additional requirements applicable to this contract are contained in Part B1 of the project specifications.

The number of each clause and each payment item in this part of the project specifications is prefixed “PS” and numbered sequentially followed by a number corresponding to the relevant clause or payment item in the standard specification in parentheses.

New clauses and payment items not covered by clauses or items in the Standard Specifications have also been included.

Additional particular specifications are also included in Part B2 and are prefixed “P” and numbered alphabetically.

PART B1: AMENDMENTS TO THE STANDARD SPECIFICATIONS

PSA GENERAL

PSA.1 MATERIALS (3)

PSA 1.1 QUALITY (3.1)

All materials used in this contract shall comply with the relevant SABS Specification (as amended) or particular specification as noted.

PSA.2 PLANT (4)

PSA.2.1 PLANT FOR CONSTRUCTION PURPOSES (No reference)

The Contractor's plant for construction purposes shall be of modern design, adaptable for the purpose for which it is required, in sound condition, and ample in capacity for carrying out the Works expeditiously.

Should the Engineer be of the opinion that the plant in use is in any way unsuitable for carrying out the Works in a manner or at a rate commensurate with the requirements of the Contract, they shall have the right to call on the Contractor at any time during the progress of the works to provide additional or improved plant and tools as may be necessary to meet these requirements.

PSA.2.2 CONTRACTOR'S CAMP (4.2)

No housing is available for the Contractor's employees, and the Contractor shall make his own arrangements with the Local Authority regarding the housing of his employees and transporting them to site.

The Contractor shall provide in locations approved by the Engineer, adequate sanitary facilities for the use of all persons engaged on the Works. Such conveniences, which shall comply with Local Authority regulations, shall be maintained in a clean and hygienic condition and shall be properly secluded from public view and their use shall be strictly enforced.

The Contractor shall make his own arrangements with the municipal authorities for any bucket removals and shall bear all the costs in connection with such service. On removal of such conveniences the sites thereof shall be left in a clean, sanitary and tidy condition.

PSA.3 PERSONAL & OTHER PROTECTIVE EQUIPMENT (SECTIONS 8/15/23 OR THE OHS ACT)

The Contractor is required to identify the hazards in the workplace and deal with them. He must either remove them or, where impracticable take steps to protect workers and make it possible for them to work safely and without risk to health under the hazardous conditions.

Personal Protective equipment (PPE) should, however, be the last resort and there should always first be an attempt to apply engineering and other solutions to mitigating hazardous situations before the issuing of PPE is considered.

Where it is not possible to create an absolutely safe and healthy workplace the Contractor is required to inform employees regarding this and issue, free of charge, suitable equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.

It is a further requirement that the said equipment be maintained by the Contractor, that he instructs and trains the employees in the use of the equipment and ensures that the prescribed equipment is used by the employee/s.

Employees do not have the right to refuse to use/wear the equipment prescribed by the employer and, if it is impossible for an employee to use or wear prescribed protective equipment through health or any other reason, the employee cannot be allowed to continue working under the hazardous condition/s for which the equipment was prescribed but an alternative solution has to be found that may include relocating or discharging the employee.

The Contractor may not charge any fee for protective equipment prescribed by him/her but may charge for equipment under the following conditions:
- Where the employee requests additional issue in excess of what is prescribed
- Where the employee has patently abused or neglected the equipment leading to early failure
- Where the employee has lost the equipment

All employees shall, as a minimum, be required to wear the following PPE on any projects:
- Protective overalls
- Protective footwear
- Protective headwear
- Eye/face protection

All PPE provided to local labour working on the Expanded Public Works Programme shall be branded in accordance with the EPWP CI Manual. Typical elements which shall be branded include:
- Protective overalls
- Reflective vests
- Protective headwear

The rate for local labour shall include for the supply of EPWP branded PPE in accordance with the Provincial EPWP specifications. The rate shall include the additional cost of the specified colours for the PPE and branding in accordance with CI manual.

THE TENDERED RATE SHALL INCLUDE FULL COMPENSATION FOR BRANDING THE PPE AS DETERMINED IN THE RISK ASSESSMENTS AND AS REQUIRED FOR FULL DURATION OF THE CONTRACT.

PSA.4 EPWP SIGNBOARD

The Contractor will be required to erect a signboard displaying the EPWP logo, indicating that this project is part of the EPWP. All costs related to the provision, erection and subsequent removal of the signboard shall be refunded to the Contractor through the provisional sum included in the Schedule of Quantities for this purpose.

PSA.5 COMMUNITY LIAISON OFFICER (CLO)

The contractor or his appointed agent will appoint a Community Liaison Officer (CLO) after consultation with the local communities, the engineer and the employer. The contractor shall direct all his liaison efforts with the local communities through the appointed officer. The contractor shall, however, accept the appointed as part of his management personnel.

(a) Duties of the Community Liaison Officer

The Community Liaison Officer's duties will be:

(i) To be available on site daily between the hours of 07h30 and 16h30 and at other

time as the need arises. His normal working day will extend from morning until 17h30 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 as illustrated in Part C5.1 of this document (form RDP 12(E)).

(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 jointly by the contractor, engineer and employer.

PSA.6 COMMUNITY PARTICIPATION.

PSA.6.1 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.

PSA.6.2 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.

PSA.6.3 PROCEDURES

PSA.6.3.1 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.

PSA6.3.2 The PLC shall make recommendations by consensus. If consensus cannot 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.

PSA.6.4 TASKS OF THE PLC

2.4.1 To assist with community liaison and resolution of disputes.
2.4.2 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.
2.4.3 To advise on and monitor labour issues.
2.4.4 To assist in resolving labour disputes.

PSA.6.5 ASSISTANCE TO THE PLC

PSA.6.5.1 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.

PSA.7 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.

PSA.8 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.

PSA.9 LABOUR-INTENSIVE CONSTRUCTION METHODS

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 bringing about the effective substitution of labour for plant and 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, or where the use of plant is essential as a result of occupational health and safety considerations, the Contractor shall use only hand tools and equipment in the construction of those portions 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 utilizing only locally employed labour and/or the labour of local subcontractors, supplemented by the Contractor's key personnel to the extent necessary and unavoidable, unless otherwise instructed by the Engineer and in accordance with the further provisions of the relevant sections of Portion B of the Project Specifications.

Subject to considerations of occupational health and safety, the portions of the Works to

be executed using labour-intensive construction methods are:

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

PSA9.1 MATERIAL

Where possible, the contractor shall source material from within ## km of the site utilizing local labour. The material which may be sourced from site includes:
Rock for gabions and stone pitching

PSA9.2 TASK BASED ACTIVITIES

Labour Intensive activities are to be planned as task-based works where required. Task based refers to a specific amount of work to be performed which is clearly defined by a quantity and quality. Typically, a particular task can be completed within a working day.

PSA.10 REQUIREMENTS OF EXPANDED PUBLIC WORKS PROGRAMME

PSA10.1 EPWP PROJECT SPECIFICATION

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

PSA.11 EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR INTENSIVE WORKS

Requirements for the sourcing and engagement of labour.

PSA.11.1 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.

PSA.11.2 The rate of pay for the EPWP is set by the Municipality in consultation with the community leaders.

PSA.11.3 Tasks established by the contractor must be such that:
a) the average worker completes 5 tasks per week in 40 hours or less; and b) the weakest worker completes 5 tasks per week in 55 hours or less.

PSA.11.4 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 11.3.

PSA.11.5 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 have less than one full time person earning an income;
c) where subsistence agriculture is the source of income.
d) those who are not in receipt of any social security pension income

PSA.11.6 The Contractor shall endeavour to ensure that the expenditure on the employment of temporary workers is in the following proportions:
a) 55 % women;
b) 55% youth who are between the ages of 18 and 35; and
c) 2% on persons with disabilities.

PSAB ENGINEER'S OFFICE

PSAB.1 MATERIAL (3)

PSAB.1.1 NAMEBOARDS (3.1)

The Contractor shall supply two nameboard in accordance with the details indicated in this document.

The board shall be placed in a position designated by the Engineer.

This board shall remain the property of the Contractor who shall dismantle and remove the said board on completion of the contract.

PSAB.1.2 OFFICE BUILDINGS (3.2)

No facilities are required for the Engineer.

PSAB.1.3 **PLANT** (4)

No telephone facilities are required by the Engineer.

PSC SITE CLEARANCE

PSC.1 MATERIALS (3)

PSC .1.1 DISPOSAL OF MATERIAL (3.1)

Suitable spoil sites will be located on site by the Engineer and confirmed by the issue of a site instruction. The Contractor may not make his own arrangements in this regard without the written approval of the Engineer.

PSC.2 CONSTRUCTION (5)

PSC.2.1 AREAS TO BE CLEARED AND GRUBBED (5.1)

Areas to be cleared and grubbed shall be classified as follows:

a) General Clearing and Grubbing

Any areas requiring particular clearing and grubbing must be agreed with the Engineer prior to any such clearing taking place. Any area cleared without the consent of the Engineer will not be measured in terms of this Clause and may result in further action being taken against the Contractor in terms of any contravention with the environmental management plan. Where the Engineer has instructed that clearing must take place or is required, it shall be measured as a strip 3m wide.

PSD EARTHWORKS

PSD.1 MATERIALS (3)

PSD .1.1 CLASSIFICATION FOR EXCAVATION PURPOSES (3.1)

Classification of material other than "soft excavation" shall be agreed with the Engineer before excavation may be commenced.

The Contractor shall immediately inform the Engineer if and when the nature of the material being excavated changes to such an extent that a new classification for further excavation is warranted. Failure on the part of the Contractor to advise the Engineer thereof in good time shall entitle the Engineer to classify, at his discretion, such excavation as may have been executed in material of a different nature.

For the purpose of this contract all material will either be classed as, intermediate, hard rock or Boulder Class A.

No differentiation shall be made between “intermediate” and “Boulder Class B” excavation.

PSD.1.2 **Classes of excavation** (3.1.2)

a) In all cases where soft founding materials is classified as suitable for culvert beddings construction, the in-situ material shall be ripped, moistened and compacted to 90& to 93% modified AASHTO density. The depth of preparation and compaction of founding material shall be indicated on drawings as specified by the engineer. Allowance for measurement and payment for this work is made in the bill of quantities under this section"

e) Boulder excavation Class B - Shall be classified as intermediate excavation

PSD.2 CONSTRUCTION (5)

PSD.2.1 **Conservation of Topsoil (**5.2.1.2)

Topsoil stripping shall be 150mm and the material shall be conserved separately for re-use as specified in the environmental management plan.

PSD.2.2 **Disposal** (5.2.2.3)

All excess material shall be disposed of at the designated spoil sites leveled in layers not exceeding 300 mm and compacted to 90% MOD AASHTO density.

PSD.2.3 **Erosion Control Berms** (Add new Clause 5.2.3.3)

Where instructed by the Engineer, earth berms shall be constructed to the dimensions shown on the drawings or to the detail instructed by the Engineer. The berms shall comprise excess fill material from the trench, shall be hauled by wheelbarrow, placed and shall be hand stamped in layers not exceeding 150mm. The berms shall be slightly overfilled before being be shaped to the detail shown on the drawings. The material shall wherever possible be sourced within the freehaul distance of 500m. After completion, the Engineer may instruct the Contractor to construct un-grouted, handpicked and packed stone pitching along the upstream edge of the berm.

PSD.2.4 **Sandbag Protection to Pipe Trench** (Add new Clause 5.2.3.4)

Where instructed by the Engineer, 25kg sandbags made from woven polypropylene shall be filled with selected fill material as specified in SABS 1200 LB and placed in a stretcher bond pattern around the pipe. The bags shall be firmly packed and hand stamped into place and shall be keyed a minimum of 500mm into the side wall of the trench. Where specified, the selected fill material shall first be brought to optimum moisture and then stabilized by the addition of 1% cement.

PSD.2.5 **EPWP Construction Methods**

The generic labour-intensive specification below is the same as sans 1921-5, construction and management requirement for works contracts- part 5: earthworks activities which are to be performed by hand and should be included in the scope of works without amendment or modification as set out below.

SCOPE
This specification establishes general requirements for activities which are to be executed by hand involving the following:

a. Trenches having a depth of less than 1.5metres
b. Stormwater drainage
c. Low-volume roads & sidewalks

PRECEDENCE
Where this specification is in conflict with any other standard or specification referred to in the scope of works to this contract, the requirements of this specification shall prevail.

HAND EXCAVATEABLE MATERIAL
Hand excavatable material is material:

a. granular materials:
   I. Whose consistency when profiled may in terms of table 1 be classified as very loose, loose, medium dense, or dense; or
   ii.where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 15 blows of a dynamic cone penetrometer is required to penetrate 100mm;
b. cohesive materials:
   i. whose consistency when profiled may in terms of table 1 be classified as very soft, soft, firm, stiff and stiff / very stiff; or
   ii. where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 8 blows of a dynamic cone penetrometer is required to penetrate 100mm;

1) A boulder, a cobble and gravel is material with a particle size greater than 200mm, between 60 and 200mm.
2) A dynamic cone penetrometer is an instrument used to measure the insitu shear resistance of soil comprising a drop weight of approximately 10 kg which falls through a height of 400mm and drives a cone having a maximum diameter of 20mm cone angle of 60° with respect to the horizontal) into the material being used.

Table 1.: Consistency of materials when profiled

GRANULAR MATERIALS		**COHESIVE MATERIALS**	
CONSISTENCY	**DESCRIPTION**	**CONSISTENCY**	**DESCRIPTION**
Very loose	Crumbles very easily when scraped with a geological pick.	Very Soft	Geological pick head can easily be pushed in as the shaft of the handle.
loose	Small resistance to penetration by sharp end a geological pick.	Soft	Easily dented by thumb; sharp end of a geological pick can be pushed in 30-40 mm; can be moulded by fingers with some pressure.
Medium dense	Considerable resistance to penetration by sharp end a geological pick.	Firm	Indented by thumb with effort; sharp end of a geological pick can be pushed in upto 10 mm; very difficult to mould with fingers: can just be penetrated with an ordinary hand spade.
Dense	Very high resistance to penetration by the sharp end of geological pock: requires many blows for excavation.	Stiff	Can be indented by thumb-nail; slight indentation produced by pushing geological pick point into soil: cannot be moulded by fingers.
Very Dense	High Resistance to repeated blows of a geological pick.	Very Stiff	Indented by thumb-nail with difficulty: slight indentation produced but blow of a geological pick point.

Trench Excavation
All hand excavatable material in trenches having a depth of less than 1.5 metres shall be excavated by hand.

Compaction of backfilling to trenches (areas not subject to traffic)
Backfilling to trenches shall be placed in layers of thickness (before compaction) not exceeding 100mm. Each layer shall be compacted using hand stampers
a) to 90% Proctor density:
b) Such that in excess of 5 blows of a dynamic come penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more that 10% gravel of size less that 10mm and contains no isolated boulders, or
c) Such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

Excavation
All hand excavatable material including topsoil classified as hand excavatable shall be excavated by hand. Harder material may be loosened by mechanical means prior to excavation by hand.

The Excavation of any material which presents the possibility of danger or injury to workers shall not be excavated by hand

PSD.3 MEASUREMENT AND PAYMENT

PSD.3.1 Erosion Control Berms …….Unit (m^3)

The rate shall include for all costs to source the material, remove any oversized material, load, haul within the freehaul, offload, spread, overfill, compact and trim to the finished dimensions shown on the drawings.

PSD.3.2 Sandbag Protection to Pipe Trench.....…….. Unit (No)

The rate shall include for all costs to supply the 25kg bags, select material, fill bags, place in restricted areas and hand stamp.

PSD.3.3 Extra-Over Sandbag Protection for Stabilisation……..……...Unit (No)

The rates shall include all extra costs to ensure that the material is at optimum and to supply and mix cement at 1%.

PSD.3.4 Extra over sub-item for excavation by hand using hand tool ……..cubic metre (m^3)

Measurement shall be as specified for pay item 22.01 of the standard specifications. The tendered rate shall include full compensation for carrying out the excavation by hand where circumstances prevent the use of mechanical excavators.

PSDB EARTHWORKS (PIPE TRENCHES)

PSDB.1 MATERIALS (3)

PSDB.1.1 CLASSES OF EXCAVATION (3.1)

The classification of excavated materials shall be as specified in Subclause 3.1 of SABS 1200 D and PSD.1.2.

PSDB.1.2 CONTROL OF WATER (4.2)

The Contractor may encounter some seepage water in some of the trench excavation. No separate payment will be made for measures required to deal with this water.

PSDB.2 CONSTRUCTION (5)

PSDB.2.1 MINIMUM BASE WIDTHS (5.2)

The trench width for pipe diameters of 300 mm and less shall be minimum pipe diameter plus 500mm (250 mm side allowance) to allow adequate working space for proper jointing and laying of pipe, but shall not be wider than pipe diameter plus 600 mm

PSDB.2.2 TRENCH BOTTOM (5.5)

Add "When the trench bottom is unsuitable due to waterlogged conditions, at the direction of the Engineer the Contractor shall excavate for and lay a crushed stone mat of minimum thickness 100mm, the stone having a maximum particle size of 13 mm."

Add "The bottom of excavation for manholes and headwalls in soft ground shall be thoroughly rammed and consolidated at the Contractor's expense, before any concrete is placed."

PSDB.2.3 BACKFILLING (5.6)

PSDB.2.3.1 **General** (5.6.1)

ADD the following to the clause:

No thrust block or pipe requiring special wrapping may be covered by either the fill blanket or the main backfill until inspected and passed by the Engineer.

PSDB.2.3.2 **Disposal of unsuitable and make up of deficiency of backfill material** (5.6.3 and 5.6.5)

The free-haul distance shall be the entire site of works, for each project.

PSDB.2.3.3 **Completion of backfilling** (Clause 5.6.6)

Backfilling around the pipe shall not be allowed to fall more than 250m behind the laying of the pipe.

After the pipes have been laid, no backfilling shall be undertaken until the pipes have been inspected and approved by the Engineer.

The Contractor may use his discretion as to whether to backfill around joints before the pipeline is tested and should he decide to backfill the joints he shall be responsible for the

locating of any leaks and no extra payment shall be made for any re-excavation and subsequent reinstatement.

PSDB.2.4 COMPACTION (5.7)

PSDB.2.4.1 **Areas subject to traffic loads** (5.7.2)

Areas subject to traffic loads will be instructed by the Engineer in writing. No other areas will be considered for payment. The contractor will be expected to provide test results from an approved laboratory demonstrating that the additional compactive effort has been achieved. No additional payment will be made for these tests.

PSDB.2.5 SHORING (5.11)

In view of the fact that the excavation will take place in open areas, no additional payment will be made for shoring. The measurement width will also remain as specified herein although the Contractor may wish to batter the sides to avoid the need for shoring.

The provision for shoring shall be deemed to be included in the relevant rates for excavation. The Contractor's attention is drawn to the need to operate safely and to ensure that trenches are either shored or battered to a safe slope.

PSDB.3 MEASUREMENT AND PAYMENT (8)

PSDB.3.1 BASIC PRINCIPLES (8.1)

In addition to the activities listed in 8.1.1, excavation shall also include for the cost of piping and compacting the trench bottom to a minimum of 90% MOD AASHTO density in all materials irrespective of whether the base has been loosened or not during excavation.

PSDB.3.2 **Excavation ancillaries** (8.3.3)

PSDB.3.2.1 **Overhaul** (8.3.3.4)

Overhaul distance shall be calculated from the point of loading to the point of placing less the 0,1km freehaul, in one direction only, by the shortest practicable route. Only one type of overhaul will be measured.

PSDK GABIONS AND PITCHING

PSDK.1 MATERIALS (3)

PSDK .1.1 **Gabion Cages** (3.1.2)

The cages for gabion baskets shall comprise mesh type 80 and 2.7mm Class A galvanized wire. The cages for reno mattresses shall comprise mesh type 60 with 2.2mm Class A galvanized wire.

PSDK .1.2 **Geotextile** (3.1.3)

The geotextile shall comprise grade A2 as indicated in the tables below.

Properties		Units	Standard Grades							Test Methods
			A1	A2	A3	A4	A5	A6	A7	
Thickness	Thickness under 2 kPa	mm	1.3	1.6	1.8	2.1	2.7	3.4	4.4	SABS 0221-88
Permittivity	@ 100mm head	S^{-1}	3	2.9	2.5	2.3	2	1.7	1.1	Cal
Porosity	Under 2 kPa	%	93	93	93	93	93	92	90	GTS
Throughflow	@ 100mm head	$l/s/m^2$	300	285	250	235	200	180	110	SABS 0221-88
Permeability	1.0×10^{-3}	m/s	3.9	4.3	4.5	4.9	5.4	5.9	4.8	
Pore Size	O_{95W}	µm	240	225	205	190	165	145	100	Franzius Institute
	O_{95H}	µm	195	185	170	155	125	100	70	NF,G 38017
Penetration Load	CBR	kN	1.5	1.7	2.1	2.5	3.6	4.5	6.5	SABS 0221-88
	Elongation	%	30-50							

Installation Conditions	Grade of Geotextile				
	A1	A2	A3	A4	A5
Trench < 2.0m dep with smooth sides and rounded drainage stone with moderate compaction	•				
Trench < 2.0m deep with rough sides or sharp drainage stone with moderate compaction		•			
Trench < 2.0m deep with rough sides or sharp drainage stone with high compaction			•		
Trench > 2.0m deep with smooth sides and rounded drainage stone with moderate compaction				•	
Trench > 2.0m deep with rough sides or sharp drainage stone with high compaction					•

PSDK.1.3 **Stone** (3.2.1)
The stone to be used on this contract shall be as classified as medium in terms of Table 2.

PSDK.2 CONSTRUCTION (5)

PSDK.2.1 Stone Catchwater Berms (New clause 5.3.6)
Where instructed by the Engineer, stone catchwater berms shall be constructed to the dimensions shown on the drawings. The stone shall be classified as medium in terms of Clause 3.2.1 Table 2. The placing of the stones shall be as specified in Clause 5.3.2 with the exception that the last paragraph of Clause 5.3.2 is to be deleted.

PSDM EARTHWORKS (ROADS, SUBGRADE)

PSDM1 OPEN MITRE DRAINS

Earth mitre drains should be constructed, in metre lengths, at a slope to direct water away from the carriageway. To minimise erosion the slope should not be greater than 0.5% in unstable soil and 1% on stable soils. Spacing of drains to be constructed as per instruction be the Engineer.

PSGA CONCRETE (SMALL WORKS)

PSGA.1 PLANT (4)

PSGA.1.2 **Finish** (4.4.2)

The finish of all exposed concrete whether internal or external shall be smooth "off the shutter" all other concrete surfaces shall be measured as rough.

PSGA.2 CONSTRUCTION (5)

PSGA.2.1 **Fixing** (5.1.2)

Welding of reinforcement will not be permitted.

PSGA.2.2 **Quality** (5.4.1)

All concrete used on this contract shall be strength concrete.

On the drawings strength concrete has been designated by its characteristic strength followed by the size of stone to be used in its manufacture, e.g. 30/20 refers to a concrete of strength 30 MPa at 28 days made with 20mm stone.

PSGA.2.3 **Ready mixed concrete** (5.4.1.6)

No ready mixed concrete will be allowed in this contract. All concrete required for this project 1s to mixed using Labour Intensive methods (LI).

PSGA.3 TESTS (7)

PSGA.3.1 **Frequency of testing** (7.1.2)

As the concrete used on this contract will involve small quantities the Engineer will decide when testing is to be done. The Contractor is however required to provide a minimum of 3 moulds and to make the tests.

PSGA.4 MEASUREMENT AND PAYMENT (8)

PSGA.4.1 **Concrete** (8.1.3.3)

PSGA.4.2 (a) The unit rates for concrete shall include for the cost of testing.

PSL MEDIUM PRESSURE PIPELINES

PSL MEDIUM PRESSURE PIPELINES (SANS 1200 L)

PSL 1 Scope

This specification covers the supply galvanised steel pipeline for rising and gravity mains.

PSL 3 Materials

PSL 3.4 *Steel Pipes Fittings and Specials*

PSL 3.4.2 Steel Pipes of Nominal Bore up to 150mm

AMEND to read: -

Unless otherwise scheduled, hot dipped galvanized steel pipes and fittings of nominal bore up to 250mm shall be of heavy duty, cut grooved with flexible galvanized cast couplings and shall comply with the applicable requirements of SANS 62. Cast couplings to be rated for **40bar** with NBR gaskets, HDG grade 8.8 nuts and bolts.

PSL 3.4.3 Steel Pipes of Nominal Bore greater than 150mm

Unless otherwise scheduled, steel pipes and fittings of nominal bore over 250mm shall be manufactured to conform to SABS 719/1971 from grade 300WA steel and shall have a minimum wall thickness of 4.5mm.

PSL 3.4.4 Fittings and Specials

Add the following:

Steel specials shall be fabricated from straight steel pipe as specified in PSL.1.1.1 and PSL.1.1.2 and shall be manufactured and tested in accordance with BS 534 – Clause 4.

Where specified on the drawings or schedule of quantities, ANSI B16 curvature bends, tees and reducers shall be used.

PSL 3.7 Other Types of Pipes

PSL 3.7.1 Galvanised Restrained Steel Pipe System

Restrained steel pipes for use in 100mm and 65mm dia. bulk mains shall be galvanised 3.9mm and 3.0mm roll grooved TOSA wrap (or similar approved wrapping system) Pipe c/w cast SP coupling & petrolatum shrink sleeve joint protection respectively (as scheduled). (The piping system shall be groove-ended restrained system in accordance with SANS 815-2 as amended), Jointing of steel pipes shall be by means of Klambon RYC series SP coupling as scheduled.

The restrained piping system shall have groove ended pipe with couplings and fittings that shall comply with SANS 815-2; as amended

All pipes shall be supplied in 6m lengths with the length tolerance as per SANS 815-2-as amended

All pipes shall be galvanised in both inside and outside in accordance with SANS EN

10240.

All couplings shall be cast steel or cast iron.

All bolts, fittings and couplings shall be galvanised in accordance SANS 1461

All pipes shall be coated as indicated below;

Coating System

The coating shall be bitumen/polyolefin sleeve duplex coating, TOSA WRAP ®, or similar approved.

Approval of Batches

All raw materials as compounded in the manufacturers Quality Assurance Manual. A compliance certificate must be provided by each raw material supplier.

Bitumen/Polyolefin Sleeve Duplex Coating

Preparation and Cleaning of Pipe

i) Degreasing

Pipes shall be degreased by passing a gas flame over the surface to cabornise any contaminants.

ii) Pipe Cleaning

Pipes shall be mechanically wire brushed to Grade St.2 of ISO 8501-1 and all rust and foreign matter removed by means of blowing with compressed air, or solvent wiping.

Application of Coating

i) Outer Layer

Once the sleeve is positioned over the full length of the pipe, the heat shrinking of the sleeve is commenced one end to eliminate the risk of air entrapment. The sleeve edge is trimmed from each side of the pipe before it is transferred to the pipe inspection table.

ii) Thickness of Coating

The pipe shall be coated to a minimum thickness of 2.0mm.

iii) Method of Repairs

The area of single repair shall not exceed 10mm^2 The repair shall be carried out using a compatible melt stick. The number of repairs shall not exceed 3 per metre length of pipe.

iv) Performance Testing

The coating system shall comply with the following requirements:

PROPERTY	REQIREMENT	TEST METHOD	FREQUENCY
Water Absorption of Sleeve	<= 0.1% when immersed in water at 23^0 C for 100 days	SANS 1117	Per Project
Cathodic disbondment of Duplex system	Disbondment length <= 15mm after 28 days	SANS 1117	Per Project

Tensile strength of sleeve at yield	>= 10 MPa	ASMT 882	Per Project
Tensile strength of sleeve at break	>= 20 MPa	ASMT 882	Per Project
Elongation of sleeve at break	>= 500%	ASMT 882	Per Project
Adhesion to Steel of duplex system	> 2 N/mm	SANS 1117	Per Project
Density of sleeve	> 915 kg/m^3	ASMT D1505	Per Project
Visual	Free from visible defect	Observation	100%
Coating thickness	2.0mm	6 readings / pipe	100%
Holiday test	Nil defect @ 15 kV	SANS 10129	100%
Bond strength	> 1.5 N/mm width of strip	In house	1 per 100

PSL 3.8 Jointing Materials

Add the following:

All jointing materials such as nuts, bolts and gaskets etc. Are to be included in the respective rates for pipes and specials.

PSL 3.8.3 Flanges and Accessories

Add the following:

“All flanges shall be drilled in accordance with SABS 1123. Flanges shall be drilled to Table 16 as a minimum and shall be drilled to match the pressure rating of the adjacent fitting or pipe for pipes and fittings rated greater than 16 bar”

All buried flanges to be denso wrapped in accordance with SABS 1211, AS/NZC 4020 : 1999

PSL 3.8.4 Loose Flanges

Add the following:

“Nuts and Bolts and other fasteners shall be galvanised (SANS EN 121) hexagon head type and comply with the requirements of SABS 135 – 1971 with threads of the coarse pitch series”

PSL.4 VALVES (3.10)

PSL.4.1 **General**

Lifting lugs are to be fitted to all valves that have a mass in excess of 100kg, to be hot dip galvanized to SANS 1461.

PSL.4.2 **Resilient seal gate valves**

Resilient seal gate valves (RSV) shall comply with SABS 664 (latest amendment) with classes and flange drillings as detailed or scheduled elsewhere.

The typical application for resilient seal valves is for valves in “normally open” locations (e.g. air valves, isolating valves, in-line valves <250NB where the maximum differential pressure across the valve is not likely to exceed 16 Bar under normal operating conditions. Resilient seal valves shall not be used in terminal positions (e.g.
as scour valves) without the approval of the Engineer.

In addition they shall comply with the following:

a) General

Gate valves shall be double flanged and be resilient seated and shall be on the non-rising spindle type.

The valves shall be capable of sealing drip tight bi-directionally over the full range of pressures from zero to maximum working pressure.

b) Gate Design

The gate shall be fully rubber encapsulated inside and out to ensure drip tight sealing and to avoid corrosion and shall be provided with a 10 year replacement warrantee. The gate shall further have a drain hole, preventing stagnant water or impurities from collecting.

Rubber utilized in the coating of the wedge shall be inert and shall not impart odour, taste and colour and shall be suitable for drinking water applications. The gate nut shall not be fixed to the wedge, thereby reducing opening torques.

c) Gate and Body Design

The gate shall have optimally placed guides of wear resistant plastic so as to reduce the torques as well as to reduce wear between the rubber and the coating on the body. The bore of the body shall be straight through design in order to allow cleaning with a badger.

d) Valve Bonnet

The valve shall utilize 3 independent bonnet seals which shall include a set of stem steels embedded in non-corrosive material, a back seal to prevent leakage when changing seals and a wiper ring to protect against debris entering the valve.

Two friction washers (sizes 50mm to 200mm) and thrust ball bearings (250mm to 600mm) shall be incorporated to ensure smooth spindle operation as well as to reduce opening and closing torques.

e) Spindle

Spindles shall be made of stainless steel. The stem threads shall be rolled to maintain steel structure and increase strength and to ensure smooth thread edges and consequently a low operating torque. The spindle seat shall consist of 2 nitrile rubber O rings located in a corrosion resistant housing. A wiper ring shall also be provided.

f) Body and Assembly

The rubber bonnet gasket shall fit in the recess in the valve bonnet preventing blow out of the seal under surge conditions. The bonnet bolts shall pass through the gasket and be sunk into the bonnet and be sealed for corrosion protection.

An edge protecting ring shall permanently be fitted around the body of the bonnet joint in order to protect the coating during transportation and installation. The body of the valve shall be fusion bonded epoxy coated to a minimum D.F.T. of 250 microns.

Unless otherwise specified caps for key operation will be required for buried valves and hand wheels on valves situated in accessible chambers. Extension spindles and brackets shall be provided where detailed and hand wheels shall be clearly marked with the direction of opening.

All valves shall be clockwise closing when viewed from above.

PSL.4.3 **Wedge gate valves**

Gate valves shall comply with the requirements of SABS 664 (latest amendment) with classes and ends as elsewhere specified.

The typical application for wedge gate seal valves is for valves in “normally closed” locations (e.g. scour valves) and for valves in the normally open position (e.g. in-line valves <250NB) where the maximum differential pressure across the valve is likely to exceed 16 Bar under normal operating conditions.

Channel-guides and shoes shall be fitted to valves falling within the following pressure and size ranges:

PRESSURE	**VALVE SIZE**
Class 10	600mm and above
Class 16	350mm and above
Class 25	350mm and above
Class 40	All sizes
Class 100	All sizes

The spindles shall be of the non-rising type and shall be manufactured of solid stainless steel.

All valves shall be clockwise closing when viewed from above.

Gearing shall be chosen to limit the total effort at the hand wheel or valve key to 400 Newtons.

The valves shall be capable of being easily operated by one man against the maximum

unbalanced pressure and the total effort required to operate the valve shall not exceed 400 Newtons (i.e. A simultaneous push-pull of 200 Newtons each) on the ends of tee key 900 mm long resulting in a maximum torque of 180Nm.

In order to comply with the above requirements it has been found that the following are normally necessary for larger sizes of valves:

(a) Class 16 (PN 16) valves in sizes 80mm, 150mm and 300mm should be fitted with ball thrust collars; and
(b) Class 25 (PN25) valves in size 80mm, 150mm should be fitted with either ball thrust collars or spur gears, while 250mm and 300mm sizes should be fitted with ball thrust collars and 3 to 1 gears.
(c) Class 40 (PN40) valves in sizes 80mm, 150, 200mm should be fitted with either ball thrust collars or spur gears, while 250mm and 300mm sizes should be fitted with ball thrust collars and 3 to 1 gears.

While other forms of anti-friction devices may be acceptable it is the Contractor's responsibility to ensure that the required torque is not exceeded.

Unless otherwise specified buried valves shall be provided with caps for key operation and valves in chambers with hand wheels.

The valves shall be provided with Type B (Gunmetal) trim with pinned seat rings. The gate shall be full length. The body of the valve shall be epoxy coated to a minimum D.F.T. of 250 microns inside and out.

The gland packing shall be of the "Maxmech Style M57", "Chesterton 1724" or similar approved.

The valves are to be drop tight at working pressure.

Each valve so supplied shall be provided with a pressure test certificate.

PSL.4.4 **Butterfly valves**

These shall be solid body cast iron type for bolting to flanges and shall be of perfect closure. The valves shall be fitted with gearbox operated hand wheels or ratchet locating hand-levers, stainless steel shafts and discs and natural rubber or neoprene seals and shaft seals.

The valves shall conform to the requirements of BS 5155:1984. The class of valve shall be as specified. Specifications and test certificates shall be provided.

PSL.4.5 **Air release valves**

All valves to be pressure rated to 1600 KPa.

Air valves shall be the double purpose air release / vacuum break type.

The air release and vacuum break valve shall be of a compact single chamber design with solid cylindrical High Density Polyethylene control floats housed in a tubular stainless steel or corrosion protected body with epoxy powder coated cast iron, or s/steel ends secured by means of stainless steel tie rods.

Ball type air valves are not acceptable.

The valve shall have an integral surge alleviation mechanism which shall operate automatically to limit transient pressure rise or shock induced by closure due to high

velocity air discharge or the subsequent re-joining of separated water columns. The limitation of pressure rise must be achieved by deceleration of approaching water prior to valve closure. Relief mechanisms that act subsequent to valve closure cannot reach in the low millisecond time span required and are therefore unacceptable.

Large orifice sealing shall be effected by the flat face of the control float seating against a nitrile rubber 'O' Ring housed in a dovetail groove circumferentially surrounding the large orifice. Discharge of pressurised air shall be controlled by the seating and unseating of a small orifice on a natural rubber seal affixed to the control float.

The intake/discharge orifice area shall be equal to the nominal size of the valve i.e.; a 150mm (6") valve shall have a 150mm (6") intake/discharge orifice.

The valve construction shall be proportioned with regard to material strength characteristics, so that deformation, leaking or damage of any kind does not occur by submission to twice the designed working pressure.

The valve design shall incorporate an over pressure safety feature that will fail without an explosive effect, such as is normally the case when highly compressed air is released suddenly. This feature shall consist of easily replaceable components such as gaskets, seals or the like.

All air valves shall be supplied with a copy of the relevant factory test certificates that reflects the test pressure and valve serial number. Original factory test certificates for each valve shall be issued on completion of delivery of the valve consignment.

Each air valve shall have a plate made of corrosion – resistance material securely fixed to the body, on which the following information shall be stamped or engraved:

- The Manufacturer's Name;
- Size of valve. e.g. : DN 100;
- Class of valve e.g.: PN 16;
- The valve serial number, which must tie up with the relevant test certificate.

End connections shall comply with SABS 1123 T1600/3 or T2500/3 as applicable and all valves will be supplied with matching flanges, gaskets and stainless steel fasteners.

PSL.4.6 **Control valves**

Control valves shall comprise a centre guided diaphragm actuated globe valve of either oblique (Y) or angle pattern design. The body and cover shall be SG iron with bronze seat. The internal and external surfaces of the valve body shall be fusion bonded epoxy coated. End connections shall comply with the drilling pattern indicated on the drawings. The body shall have a replaceable non-threaded seat ring that is held in place by a set of screws, which tighten into a body groove. This seat should be accessible and serviceable without removing the valve from the pipeline. The seat area shall have a flow opening with no stem guides, bearings or supporting ribs.

The actuator assembly shall be of the double chamber design with a separating partition between the lower surface of the diaphragm and the main valve. The entire actuator assembly consisting of the seal disk, valve shaft, bearing, diaphragm assembly, separating partition and top cover must be removable from the valve as a single unit.

The actuator assembly must be capable of accepting a V-port throttling plug by simply bolting the device to the seal disk.

The main valve, solenoid pilot, limit switch, check valve, control tubing, filter and isolation valves shall be factory assembled and tested. The valve manufacturer must be completely certified in accordance with the ISO 9002 Quality Assurance Standard.

The settings and operation of the valves shall be as described herein or alternatively as indicated on the drawings.

Prior to any valve being ordered or delivered to site, the Contractor shall deliver to the Engineer a sample of a typical control valve that he proposes to use and which complies with this specification. The Engineer will then investigate whether the valve is compliant with the specification before authorizing the use of such valve. If the valve does not comply with the specification in all respects, the Engineer may reject such valve in which case the Contractor will have to source valves of the required quality and all costs associated therewith will be for the Contractor's account.

The sample shall be accompanied by the following control sheet:

Item	
Name of valve supply company:	
Overview of company with particular emphasis on service capabilities, calibration facilities and their track record in South Africa:	(*To be attached*)
Valve specification sheets (detailing compliance with this specification):	(*To be attached*)
Test certificate:	(*To be attached*)

PSL.4.7 **Water meters**

a) Bulk Meters (NB 40mm up to NB 300mm)

Water meters tendered for under this category must be of the in-line through-flow Woltman type, mechanical turbine flanged bulk water meters and must conform to the following dimensions and specifications:

Nominal Bore	**Body Lengths**	**Flange Specs**	**Working Pressure Maximum**	**Temp Maximum**
40mm	200mm	BS4504 Table 16	1600kPa	50°C
50mm	220mm	BS4504 Table 16	1600kPa	50°C
80mm	225mm	BS4504 Table 16	1600kPa	50°C
100mm	250mm	BS4504 Table 16	1600kPa	50°C
150mm	300mm	BS4504 Table 16	1600kPa	50°C
200mm	350mm	BS4504 Table 16	1600kPa	50°C
250mm	450mm	BS4504 Table 16	1600kPa	50°C
300mm	500mm	BS4504 Table 16	1600kPa	50°C

- All Woltman type mechanical meters supplied in terms of this contract shall perform to an accuracy of better than ±2% error over the meter's operating range; i.e. between Qt and Qp (Qn). The performance characteristics of the meters offered must be equal to or better than the values listed below:

Size DN	**Q_{start} m³/h**	**Q_{min} m³/h**	**Q_t m³/h**	**Q_n (Q_p) m³/h**	**Q_{max} (Q_s) m³/h**
40mm	0,15	0,3	0,8	40	60

50mm	0,15	0,3	0,7	50	90
80mm	0,25	0,5	0,8	120	200
100mm	0,25	0,8	1,8	230	300
150mm	1,0	1,8	4	450	600
200mm	1,5	4	6	800	1200
250mm	3,0	6	11	1250	1600
300mm	8,0	12	15	1400	2000

- Meters must be fitted with robust glass/copper dry dial registers, which comprise 6 digit cyclometer-type totalisers, registering in kiloliters (kl) or m³. These registers must be sealed to IP68 to prevent ingress of dirt or moisture, and must function under water, in the event of manholes flooding. The registers, which are to be fitted as standard, must be able to provide one high frequency opto-type pulse output function and two low frequency reed-type pulse output functions. Only meters which allow for very easy fitment and removal of the reed- and opto-type pulsers, normally associated with data logging, without having to break the verification seals, will be acceptable;
- No consideration will be given to meter types, which necessitate the use of special tools or fitment of any form of gland in the process of connecting pulser units, or, meters which require a register-change to switch from one volume unit per pulse to another;
- Meters must preferably offer an upgrade path to AMR (Automatic meter reading), which facilitates the fitment of “intelligent” registers at a later stage. The Contractor is to provide full details of the meter capability in this regard and furnish examples of systems already operating successfully in South Africa;
- Meters must be data logger compatible with loggers which have a proven track record and have a purpose-written software, to be used in conjunction with their bulk water meters, for network management;
- Cover bolts must be of stainless steel material to facilitate easy removal of mechanisms. Meter bodies must be coated with a high quality sintered epoxy powder coating, both internally and externally, with a minimum coating thickness of between 200 and 300 microns;
- Although most of the meters will be installed horizontally, it must be possible to install the meters vertically (with flow in the upward direction) or in an inclined position (with flow in the upward direction), should site conditions make this necessary;
- The performance of the meters offered shall not be affected by outside magnetic influences;
- A place must be provided for on the meter body, which can be drilled and tapped, for connecting a pressure transducer, for data logging, should the need arise; and
- Ability for meter mechanisms to be exchanged – or to fit new, calibrated mechanisms into used or existing meter bodies, without loss of measuring accuracy to be substantiated. This is of particular importance to facilitate cost effective ease of maintenance to the meters in the future, without the need to remove meter bodies from the pipeline.

Prior to any meter being ordered or delivered to site, the Contractor shall deliver to the Engineer a sample of a typical bulk meter that he proposes to use and which complies with this specification. The Engineer will then investigate whether the meter is compliant with the specification before authorizing the use of such meters. If the meter does not comply with the specification in all respects, the Engineer may reject such meter in which case the Contractor will have to source meters of the required quality and all costs associated therewith will be for the Contractor’s account.

The sample shall be accompanied by the following control sheet:

Item	
Name of official local meter distribution company:	
Overview of company with particular emphasis on service capabilities, calibration facilities and their track record in South Africa:	(*To be attached*)
Meter specification sheets (including head loss across meter, minimum upstream/downstream straight pipe lengths and compliance with this specification):	(*To be attached*)
Test certificate:	(*To be attached*)

b) Domestic (Plastic bodied, wet dial water meters)

Water Meters used in this application must comply with the South African Bureau of Standards Specification No. 1529-1:1994 and must be approved in terms of Section 18 of the Trade Metrology Act No. 77 of 1973 and Regulation 80 of Part II of the Trade Metrology Regulations.

All meters must be tested and sealed by an authorised official in a SANAS, (SANS 0259) accredited laboratory, situated within the borders of the Republic of South Africa. The seal must include the Trade Metrology Authorisation number and copies of the test certificate must be made available free of charge on request by the Engineer.

Meters tendered for under this category must be the plastic bodied, wet dial, domestic water meters, and must conform to the following dimensions and specifications:

METER SIZE	**15mm**	**20mm**	**25mm**
Maximum Flow rate qs ± 2% (m³/h)	3	5	7
Permanent Flow rate qp ± 2% (m³/h)	1,5	2,5	3,5
Transitional Flow rate qt ± 2% (l/h)	22,5	37,5	52,5
Minimum Flow rate q min ± 5% (l/h)	15	25	35
Starting Flow (l/h)	5,7	5,7	10
Maximum Working Pressure (kPa)	1600	1600	1600
Body Length (mm)	165	165	198
Alternate Body Length (mm)	114	-	-
Pulse Output (l)	0.5	0.5	5.0

- Counter must be of a wet dial type to prevent condensation under the lens;
- Counter window of minimum 7mm thickness that cannot be penetrated, by means of a needle or similar sharp instrument in order to stop the counter from operating, without destroying the unit and allowing an uncontrollable discharge of water;
- The meter must be approved by Trade and Metrology for vertical and horizontal installation;
- The meter must be suitable for rhythmic pulsating flows with a pulse output;
- The meter must be suitable for use with water temperatures up to 50°C and a

maximum working pressure of 1 600 kPa;
- The maximum rate of flow (Qs) must be achieved at a pressure drop not in excess of 100 kPa across the inlet/outlet of the meter;
- All internal plastic components to be constructed of virgin materials and may not contain any materials of scrap value;
- Each meter must be backed with a 3 year guarantee against faulty workmanship and/or materials;
- The meter supplier and/or manufacturer must have an SANS 0259 accredited laboratory and each meter unit is to be tested and sealed by an authorised official;
- Meters are to comply with a Class “C” accuracy determination;
- Meters shall have built-in non-return valves to prevent reverse flow;
- The serial number of the meter cartridge must be clearly visible from the position that the meters are normally read;
- Meters offered shall not be affected by outside magnetic influences; and
- The local meter distribution company supplying the meters to the Contractor must have a proven track record for the supply of plastic bodied, domestic meters.

Prior to any meter being ordered or delivered to site, the Contractor shall deliver to the Engineer a sample of a typical meter that he proposes to use and which complies with this specification. The Engineer will then investigate whether the meter is compliant with the specification before authorizing the use of such meters. If the meter does not comply with the specification in all respects, the Engineer may reject such meter in which case the Contractor will have to source meters of the required quality and all costs associated therewith will be for the Contractor’s account.

The sample shall be accompanied by the following control sheet:

Item	
Name of the official, local. meter distribution company:	
Overview of company with particular emphasis on service capabilities, calibration facilities and their track record in South Africa:	(*To be attached*)
Meter specification sheets (including head loss across meter, minimum upstream/downstream straight pipe lengths and compliance with this specification):	(*To be attached*)
Test certificate:	(*To be attached*)

In spite of the requirements of SANS1529-1:2003, the Contractor must be prepared to perform the following tests in the presence of the engineer, if so required by him:

- Witness testing of a random sample of 5 meters in the test laboratory of the local meter distribution company, on the test rig normally used for the testing and calibration of these meters. Special attention will be given by the engineer to the actual performances of the meters offered, rather than the minimum performance as laid down by SANS1529-1:2003 for Class B specifications; and
- All costs associated with the above tests will be borne by the Contractor. The Employer will carry traveling costs to and from the laboratory of the official local meter distributor.

PSL.4.8 **Flow control device**

The device shall comply with the following:

- The device must be IP68 rated;
- The device must be capable of being interrogated, tested and re-programmed in the field using an appropriate electronic device which can be linked to a desktop and data downloaded to “Excel” for analysis;
- The device must be capable of delivering a minimum flow rate of 10 l/min;
- The device must have a minimum battery life in excess of 5 years;
- The device must be capable of delivering a preset volume of water (daily, monthly or as required) at full pressure;
- Daily and monthly allocation must be adjustable in field to higher/lower amounts without the need to replace any parts
- The maximum daily amount must be guaranteed (therefore must not be dependent on pressure fluctuations in the network);
- The device must be capable of withstanding a pressure of up to 10 bar;
- The device must be capable of logging the hourly consumption – over a minimum 3 month period;
- The device must have a built in safety function which shuts off the flow in the event of the reed switch cable being tampered with or cut; and
- The device must have an option to carry-over the unused daily allocation within a month;
- The device must have security seals which prevent the uncoupling of the sensor cable from the meter pulse output;
- The device must be constructed from materials which have a very limited or no scrap value;
- The device must be able to be installed underground and to be mounted either horizontally or vertically; and
- The device must allow full bore flow (full pressure, no trickle flow) The flow limiter units must also be capable of being supplied with a field service terminal and communication cable/probe with the following features:
- Small, robust, hand held device with high quality screen and superior battery performance;
- Associated software with various operator levels to manage field usage with confidence and have security restrictions for adjusting of flow limiter settings;
- Adjustable security settings for various operator levels;
- Ability to configure flow limiters to administrator predefined usage settings;
- Ability to configure flow limiter in-field to variable settings;
- Ability to read and store flow limiter summary and detail data and download to database;
- Allow manual meter reading recordings; and
- Run flow limiter test functions

PSL.4.9 **Coatings and resistance to corrosion**

All new valves are to be epoxy coated internally and out. Coating may be either by an approved solvent based epoxy system or an approved fusion bonded epoxy system as specified below:

Contractors will be required to submit details of their proposed suppliers, coating specification and the coating system to be applied, to the Engineer for approval, before ordering the valves.

a) Solvent Based Epoxy Coating System

The epoxy shall be of the type Carboline 891; Plascogard KSIR 88; Sigmaguard EHB; AEBECOTE 330 or similar approved.

The dry film thickness (D.F.T) shall be as follows:

- Coating : 350 microns ± 50 microns; and
- Lining : 250 microns ± 50 microns

The applied coating and lining shall comply with the requirements of Table 2.

TABLE 2 : Lining Requirements

No	Property	Requirements	Test Method	Frequency
1	Visual	The lining shall be smooth, free from excessive runs, sags, orange peel, occlusion or other visible defects.	Use an experienced observer.	Each Valve
2	Coating Thickness	Minimum : 200 microns Maximum : 500 microns	SABS Method 141	Minimum 6 readings/ Valve per batch
3	Electrical Insulation Defects	Nil defects when tested at 90 Volts 2 Megaohms	SABS Method 1217 – Section 8:12	One Valve per batch
4	Degree of Cure	No softening or discolouration	20 double rubs with cotton wool swab soaked in MEK	One valve per batch
5	Adhesion	Destructive testing not recommended		

b) Fusion Bonded Epoxy Powder Coating System

The Epoxy coating shall be a fusion bonded epoxy powder coating of the type Interpon PCL 331, Vedoc V VPC 2001 or similar approved.

TABLE 3 : Lining Requirements

No	Property	Requirements	Test Method	Frequency
1	Visual	Smooth glossy or semi glossy finish, free from excessive runs, sags, orange peel, occlusion or other visible defects	Use an experienced observer	Each Valve
2	Coating Thickness	Min. 200 max. 500 microns	SABS Method 141	Minimum 6 readings/ valve
3	Electrical Insulation Defects	Nil defects at 3500 Volts. For conditions for repair see Clause 3.3	SABS 1217 section 8.12.2	One Valve per batch
4	Impact Resistance	No defects at 2 joules	SABS 1217 section 8.7	Random 5% of Valves
5	Degree of cure : Dynamic Test	No softening or discolouration	20 double rubs with cotton wool swab soaked in MEK	One Valve per batch

The cured fusion bonded epoxy powder coating shall meet the requirements specified in Table 3 above.

Where extended spindles are used these shall be galvanised.

PSL.5 MANHOLES AND SURFACE BOXES (3.11)

PSL.5.1 **Manhole covers and frames** (Clause 3.11.5)

Steel covers and frames and locking bars shall be as detailed on the drawings and shall be hot dip galvanized after manufacture to SANS 121 :2000/ISO 1461 : 2000.
The Contractor shall submit certificates certifying that all galvanized covers and frames have been manufactured in a certified facility and meet the specifications noted above. Retention will not be released until such certificates are delivered to the Engineer.

PSL.5.2 **Surface Boxes** (3.11.6)

a) Domestic meter box

The meter box shall be of an approved plastic mould design which is robust, tamper proof, has a base plate and is lockable and complies with the following:

- The locking device is to be robust and the key is to be capable of accommodating the opening torsion without twisting;
- Meterbox fittings are to be keyed into ends of box to prevent rotation on installation;
- Base plate to have drainage ports to allow water to drain;
- The box must allow fitment of meters of 115mm in length when combined with the approved flow control device. Where specified in the Bill of Quantities, boxes are also to be able to accommodate an isolating stop cock;
- The box must afford quick and easy access to perform restrictions and de-restrictions;
- Inlet and outlet fittings should be ¾" brass female connectors; and
- The lid of the box should be of high impact injection moulded plastic and must be UV stabilized.

Prior to any meter being ordered or delivered to site, the Contractor shall deliver to the Engineer a sample of a typical meter that he proposes to use and which complies with this specification. The Engineer will then investigate whether the meter is compliant with the specification before authorizing the use of such meters. If the meter does not comply with the specification in all respects, the Engineer may reject such meter in which case the Contractor will have to source meters of the required quality and all costs associated therewith will be for the Contractor's account.

1 key must be supplied together with every 25 boxes supplied and this must be provided for in the rate for the supply of the box.

PSL.6 CONSTRUCTION (5)

PSL.6.1 LAYING (5.1)

Pipe-laying personnel

The laying of pipes and ancillary fittings shall be performed only by a qualified person who is registered as an artisan in the plumbing, pipe fitting, or drain laying trade or who is qualified by reason of having attended and passed the course on pipe laying of the Civil Engineering Industry Training Board. The Contractor will be expected to provide proof of this requirement.

PSL.6.2 **Pipe laid to radii** (5.1.4.2)

ADD the following: -
Where rigid pipes have been indicated as being laid to radii the maximum deflection angle at any flexible coupling may be no more than 50% of that permissible deflection as specified by the manufacturer for that diameter and class coupling.

Where uPVC pipes have been indicated as being laid with radii to accommodate changes in grade or horizontal alignment these radii must be taken up over a minimum of 3 pipe lengths for deflection angles less than 9° and one extra pipe length per 3° thereafter.

PSL.6.3 JOINTING METHODS (5.2)

ADD the following: -

PSL.6.3.1 **Flexible couplings**

At all positions where steel pipes or specials are cast into a concrete structure in an underground position the first joint outside the structure and a joint 1m from the structure shall be made by using a Viking-Johnson or similar approved flexible coupling unless otherwise specified.

At flexible couplings the pipe ends shall be at least 10mm apart to accommodate any pipe expansion.

In all isolating, reflux and scour valve chambers at least one pipe/valve connection shall be made by means of a Viking-Johnson or similar approved flexible flange adapter coupling to facilitate the removal of the valve from the line. The coupling shall be an equivalent class to the valve or higher.

PSL.6.4 THRUST BLOCKS (5.5)

PSL.6.4.1 **Thrust block size**

Thrust blocks will be required at all changes of direction, reducers, end caps, tees and where otherwise directed by the Engineer.
The Contractor may not backfill any thrust block until it has been approved by the Engineer in writing. If there is any doubts regarding the suitability of the insitu materials at any location, the Contractor shall obtain a ruling from the Engineer prior to casting the thrust blocks.
The rate for blocks includes for all costs to shutter the blocks so that a neat product is produced. Sandbags and other means of shuttering will not be permitted.

PSL.6.5 DISINFECTION OF POTABLE WATER PIPELINES (Clause 5.10)

The disinfecting of the potable water pipeline shall be as follows:

(a) The pipeline shall be flushed out with clean water until all sediment and other foreign matter has been removed.

(b) The pipeline shall then be refilled with potable water containing 10 mg/litre calcium hypo chloride. Further hypo chloride shall be put into the pipeline at air valve installations to ensure an even distribution throughout the pipeline should this be necessary.

(d) The pipeline should be allowed to stand for 24 hours and samples then taken from suitable scour points. These should contain a chlorine residual of at least 1 mg/litre. Should this not be attained further doses of calcium hypochloride shall be added to the water.

PSL.6.6 MARKERS (No reference)

The Contractor shall supply and place in position concrete markers to indicate the position of all sluice valves, air valves and hydrants. These shall be set opposite the fittings whose positions they are to indicate.

The whole marker shall be painted yellow with two coats of approved yellow road marking paint and the letters “W” above and “V", "AV" or "SV" or “IV” below as appropriate painted in black enamel. The contractor is to submit a sample for approval prior to mass producing the markers.

In addition to the above pipe route markers will also be positioned along supply routes at positions instructed by the Engineer. The marker shall generally be placed 1.5m from the pipe centre line on the LHS as seen in the direction of flow.

PSL.7 TESTING (7)

PSL.7.1 **Standard hydraulic pipe test** (7.3.1.2)

REPLACE with the following: -

Subject to the provisions of 7.3.1.3 and 7.3.1.4 the test pressure for field-testing shall be 1,25 times the maximum working pressure for the class of pipe specified.

PSL.8 MEASUREMENT AND PAYMENT (8)

PSL.8.1 **Supply, Lay and Bed Pipes Complete with Couplings** (8.2.1)

ADD the following: -

The rate for laying shall be deemed to include for connecting pipes to existing pipes where necessary.

The rate for testing of pipelines and appurtenances shall be deemed to include for the supply and loan of temporary valves, end caps, blank flanges, isolating-type devices, buffer beams or anything else the Contractor considers necessary to complete a successful test.

PSL.8.2 **Special wrapping in corrosive soils** (8.2.15)

The rate for wrapping of steel pipes and specials as set out in PSL.3.4 shall be deemed to include for the packing with bitumen based mastic and external encasing protection of joints and couplings as well as the outer protective wrap.

PSL.8.3 **Lay and Bed Pipes Complete with Couplings** (8.2.16)

ADD the following: -

The rate shall include the cost for checking all pipes at the stockpile, loading, transporting to construction site and off loading.

The rate for laying shall be deemed to include for connecting pipes to existing pipes where necessary.
The rate for testing of pipelines and appurtenances shall be deemed to include for the supply and loan of temporary valves, end caps, blank flanges, isolating-type devices, buffer beams or anything else the Contractor considers necessary to complete a successful test.

PSLB BEDDING (PIPES)

PSLB.1 INTERPRETATIONS (2)

PSLB.1.1 DEFINITIONS (2.3)

Add the following new definition:

PSLB.1.1.1 **Stone mat**

Material that complies with the requirements of PSLB.2.3

PSLB.2 MATERIALS (3)

PSLB.2.1 SELECTED GRANULAR BEDDING (3.1)

Add the following new subclause:

PSLB.2.1.1 STONE MAT (3.1.1)

Stone mat shall be 13,2mm nominal size stone for concrete complying with the requirements of SABS 1083 (Category 2).

PSLB.2.2 BEDDING (3.3)

PSLB.2.2.1 GRANULAR BEDDING (3.3.1)

Add the following to the clause:

"All granular material must come from suitable borrow pits. Material from borrow pits must be tested, and results supplied to the engineer for approval prior to use.

The rate for granular material sourced from borrow pits shall include for all work to select, remove oversize and/or unsuitable material by sieving etc."

PSLB.2.2.2 PLACING OF BEDDING (3.5)

Add the following new clause:

"All bedding from commercial/borrow shall be hauled and placed along the trench at intervals not closer than 100m. The bedding material shall then be hauled with wheel barrow from the stockpile to the trench by Labour intensive methods (LI)."

PSLB.3 CONSTRUCTION (5)

PSLB.3.1 Details of Bedding (5.1.2)

Delete clause 5.1.2a and 5.1.2b and substitute:

"Pipes should be bedded and protected in accordance with the details shown on the relevant drawing".

PSLB.4 TOLERANCES (6)

PSLB.4.1 MOISTURE CONTENT AND PAYMENT (6.1)

Add the following to the clause:

"Permissible deviations of moisture content and density shall conform to Class II degree of accuracy."

PSLB.5 MEASUREMENT AND PAYMENT (8)

PSLB.5.1 **Disposal of displaced material** (8.1.5)

Amend to read:

"Material displaced by importation of material in terms of 8.1.2 shall be spread leveled and shaped to conform with the natural contours adjacent the trench. Overhaul will be paid on such material. In all cases the thickness of the material once spread shall not exceed 100mm".

PSLE STORMWATER DRAINAGE

PSLE 1 STANDARD HEADWALLS

Standard headwall, all included

a) 600mm diameter pipe.....Unit: No

The unit of measurement will be the number (No) of headwalls constructed complete for a pipe culvert crossingUsing "NFX" bricks as per the KZNDOT Standard drawings. The rate shall be an all-inclusive rate to construct the headwall as per the standard details and/or as per Engineer's Instructions

PSMM ANCILLARY ROADWORKS

PSMM1 E/O FOR EXCAVATION OF POSTS IN HARD

The unit of measurement will be the number (No) of holes to excavated using pneumatic tools to excavate the hole to the correct depth.

PSMM2 STATUTORY SIGNS

The unit of measurement will be No of complete sign 610 mm in size, 100mm * 3.7m creosoted pole installed

PART B2 : PARTICULAR SPECIFICATIONS

In addition to the Standardized and Project Specifications the following Particular Specifications shall apply to this contract and are bound in hereafter.

PB: OHSA 1993:HEALTH AND SAFETY SPECIFICATION

PC: ENVIRONMENTAL MANAGEMENT SPECIFICATION

PB: 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:

- Working high above the ground on top and below the bridge, most of the time in a restricted environment with limited landings (working platforms);
- Working above a continuously flowing river and in a flood plain environment subject to flooding;
- Lifting and lowering of materials and equipment from the ground to the bridge and vice versa, exposed to cross winds;
- Steep and restricted access to the lower flood plain below the bridge
- Potentially dangerous existing services, i.e. gas lines, water and sewerage mains, electrical high voltage cables, on the bridge, buried and overhead
- Deep excavations in soils requiring shoring or reducing of slopes
- Blasting of hard rock or demolition of concrete
- High pressure during testing of the new rising main, which could result in potentially dangerous situations in the event of the pipeline of fittings failing
- Potentially harmful gasses when tying into existing sewer mains
- Movement of construction vehicles on site, taking into consideration steep slopes, other traffic and existing services
- Exposure to possible injuries due to mishandling or failure of power and hand tools
- Falling debris, tools and materials from bridge
- Non-conformance to specifications with regards to fasteners and materials
- Risks related to general safety and security on site

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;
(e) construction work that will exceed 30 days or 300 person-days;
(f) 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 CONTRACTORS 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 tunnelling 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 PB8 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 : ENVIRONMENTAL MANAGEMENT PLAN

PC.1 PLANS

Prior to establishment of the site camp(s), the Contractor shall produce a plan showing the positions of all buildings, laydown yards, vehicle wash areas, fuel storage areas, batching areas and other infrastructure for approval by the Engineer.

PC.2 USE OF LAND

The Contractor shall not use the land comprising the Works or any land connected to the Works, for any purpose whatsoever other than for the proper carrying out of the Works and shall place any camps that may be required for himself and his employees only on sites approved by the Engineer.

No trees or bushes shall be damaged or cut down by the Contractor or by any of his employees whether for use in the Works or otherwise without the written consent of the Engineer.

PC.3 VEGETATION CLEARANCE

PC.3.1 Woody vegetation

PC.3.1 .1 Prior to the start of construction, woody vegetative matter shall, where directed in writing by the Engineer, be stripped. This material shall either be spread randomly throughout the surrounding veld so as to provide biomass for other micro-organisms and habitats for small mammals and birds, or it may be stockpiled for later redistribution over the reinstated topsoiled surface.

PC.3.1.2 No vegetative matter shall be burnt or removed for firewood.

PC.3.2 Herbaceous vegetation

During clearing of woody vegetation no basal cover or grass and topsoil shall be removed and damage to this layer shall be minimized as far as possible.

PC.4 PROTECTION OF VEGETATION

The Contractor shall ensure that all works are undertaken in such a manner that vegetation outside the Works area is not damaged.

PC.4.1 Vegetation within or adjacent or outside the Works area

The following provisions shall apply with respect to the protection of areas of vegetation.

PC.4.1.1 No tree or shrub shall be felled, lopped, cut or pruned without the prior written approval of the Engineer;

PC.4.1.2 No tree or shrub shall be felled, lopped, cut or pruned until it has been clearly marked for this purpose by the Engineer;

PC.4.1.3 No tree shall be burned for any reason;

PC.4.1.4 For every tree protected by these specifications, which is removed or, in the opinion of the Engineer, is unduly damaged by the Contractor, the Contractor shall pay a penalty of R2000,00 per tree to the Employer;

PC.4.1.5 Trees which have been selected for preservation by the Engineer shall be fenced around their drip line. The fence shall be clearly marked with danger tape. No open fires shall be allowed within this fenced area, nor shall vehicles be parked underneath these trees. The area shall also not be used for material storage or as allocation for temporary buildings; and

PC.4.1.6 Where such trees are located within the working width of the pipeline, the pipeline shall be aligned to avoid these trees wherever possible.

PC.4.2 Transplantation of rare and endangered plant species

Prior to vegetation clearing, any rare or endangered plant species which have been identified by the Engineer or his environmental representative must be removed and transplanted as instructed herein.

PC.4.2.1 Transplanting of small trees (1 to 1,5m height) and small shrubs (0,5 to 1m height)

a. Trees and shrubs shall only be transported between the months of April and September. Deciduous trees and shrubs shall be transplanted only when they are in a leafless condition.

b. Holes for transplanting trees and shrubs shall be dug before these plants are dug out. Trees shall be planted in holes of 1m x 1m x 1m and shrubs shall be transplanted in holes of 600mm x 600mm x 600mm.

c. Trees and shrubs shall be planted so that their stems or trunks are at the same depth as in their original location. The orientation of the transplanted plants must be the same as in their original location (i.e. the north-facing side of the plant must remain north-facing after it has been planted.)

d. Transplanted plants shall be pruned to limit transpiration. Plants shall also be sprayed with an evapotranspiration retardant liquid if they are evergreen.

e. Transplanted plants shall be watered once a week for 5 weeks and thereafter once every 2 weeks.

PC.4.2.2 Transplanting aloes, succulents and bulbous plants

a. Aloes, succulents and evergreen bulbous plants may be transplanted at any time of the year.

b. Aloes and bulbous plants shall be planted in similar conditions and to the same depth as they were before they were removed.

c. Transplanted aloes and bulbs shall be watered once directly after transplanting to settle the soil.

PC.4.3 Alien vegetation

The Engineer may instruct the Contractor to remove alien vegetation from the works area for the duration of the construction and maintenance period. Such vegetation will be identified by the Engineer or his environmental representative and the method of eradication will be specified by him/her.

The use of topsoil for rehabilitation contaminated with the seed of alien vegetation will not be permitted.

PC.5 PROTECTION OF FAUNA

The Contractor shall ensure that all Works are undertaken in such a manner which minimizes the impact on the local fauna and shall apply the following specifications with respect to fauna management and protection:

PC.5.1 Under no circumstances shall any animals be handled, removed, killed or interfered with by the Contractor, his subcontractors or his subcontractors' employees;

PC.5.2 The Contractor and his employees shall not bring any domestic animals onto the site;

PC.5.3 The contractor shall ensure that the work site is kept clean and tidy and free from rubbish which would attract animal pests;

PC.5.4 There shall be no feeding of animals;

PC.5.5 The Contractor shall ensure that domestic and native animals belonging to the local community shall be kept away and are safe from unprotected works; and

PC.5.6 The Contractor shall advise his workers of the penalty associated with the needless destruction of wildlife, as set out in the Animals Protection Act (Act 71 of 1962) sec. 2 (fine of R2 000 and/or 12 months imprisonment).

PC.6 ARCHAEOLOGICAL ARTIFACTS

PC.6.1 Known archaeological sites shall be indicated by the Engineer and shall be protected by a three strand fence which will be at least 2m outside the extremities of the site. The fence shall be clearly marked with danger tape.

PC.6.2 Should the Contractor expose any archaeological artefacts during excavation, work on the area where the artefacts were found shall cease immediately and the Engineer shall be notified as soon possible.

PC.6.3 Upon receipt of such notification, the Engineer will arrange for the excavation to be examined by an Archaeologist as soon as practicable. Acting upon the advice from the Archaeologist, the Engineer will advise the Contractor of the necessary actions to be taken.

PC.6.4 Under no circumstances shall archaeological artefacts be removed, destroyed or interfered with by the Contractor, his employees, his subcontractors or his subcontractors' employees.

PC.6.5 The Contractor shall ensure that none of his employees gain access to any archaeological areas (whether fenced or unfenced), except when authorised to do so by the Engineer.

PC.6.6 The Contractor shall stay strictly within the 20m working width of the Works in order to prevent disturbance of possible grave sites and remnant settlements. Should any work be necessary outside of the working width, then this shall only be done in areas approved by the Engineer.

PC.7 SCENIC QUALITY

PC.7.1 The Contractor shall not establish or undertake any activities which, in the opinion of the Engineer, are likely to adversely affect the scenic quality of the area. The Engineer may direct the Contractor to refrain from such activities or to take ameliorative actions to reduce the adverse effect of such activities on the scenic quality of the environment.

PC.7.2 No painting or marking of natural features shall be done. Marking for surveying and other purposes shall only be done with pegs and beacons.

PC.7.3 All cut and fill forms shall be rounded at the edges to blend then with the surrounding landforms.

PC.7.4 Where instructed by the Engineer, all packed and exposed rock cuttings shall be treated in order to blend their colour with the colours of the natural weathered rocks of the adjacent environment.

PC.7.5 Where instructed by the Engineer, all concrete structures shall be treated so as to blend in with the colours of the surrounding landscape. This shall be done either through painting or through treatment with a staining or coloration compound. All other permanent structures shall have colours which are chosen to blend in with the dominant colours of the surrounding landscape. Painted surfaces shall be painted with non-reflective (matt) colours.

PC.8 WORKING AREA

PC.8.1 The area of construction along any pipeline shall be contained within a 20m working width.

PC.9 ACCESS ROADS AND VEHICLE TURNING AREAS

PC.9.1 No new permanent access roads other than those agreed to by the Engineer shall be developed by the Contractor.

PC.9.2 Existing roads shall be used as far as possible for inspection purposes.

PC.9.3 Topsoil shall be stripped as specified prior to construction and reinstated on completion of the use of the road.

PC.9.4 Any temporary access road shall form part of the 20m working width servitude.

PC.9.5 All new temporary access roads shall be approved by the Engineer. No deviation from the approved access roads shall be allowed.

PC.9.6 Horse and trailer vehicles transporting pipes may not turn in areas of cultivated lands but shall turn in areas specifically identified by the Engineer.

PC.10 MATERIAL LAYDOWN AREAS

Pipe and materials shall be stored within the pipeline servitudes. Where this is not convenient or in the interests of efficiency, other areas may be designated by the Engineer.

PC.11 FIRES

No open fires shall be permitted except in areas specifically prepared and controlled for this purpose.

PC.12 FENCING

PC.12.1 Where instructed by the Engineer, fencing shall be erected around sensitive natural or cultural elements to protect them from damage. No pedestrian or vehicular access shall be allowed into such fenced areas.

PC.12.2 In places where temporary fencing is required, the Contractor shall erect such fencing when and where required by the Engineer and re-erect and maintain temporary fencing as necessary. Temporary fencing shall remain in position either until it is replaced by permanent fencing or until completion of the whole of the Works, unless the Contractor requires, or the Engineer directs its earlier removal.

PC.12.3 If any fencing is removed temporarily for the execution of any part of the Works it shall be reinstated as soon as practicable by the Contractor.

PC.12.4 The clearing for permanent fencing shall be limited to the removal of trees and shrubs within 1m of the fence line. Where, possible, the fence line must be aligned to retain trees or groups of trees. There shall be no removal of the grass cover or topsoil within this width.

PC.12.5 Any fences damaged by the Contractor shall be repaired as soon as practicable at his cost.

PC.13 TOPSOIL

PC.13.1 Source of topsoil

Topsoil shall be stripped from all areas that are to be utilized during the construction period and where permanent structures and access is required. These areas will include all areas to be excavated, the pipeline trench route, temporary and permanent access roads, construction camps, laydown areas, pump sites, valve chambers and borrow pits. Topsoil shall be stripped after clearing of woody vegetation and before excavation or construction commences.

The topsoil is regarded as the top 150mm of the soil profile, irrespective of the fertility appearance, agricultural potential, structure and composition of the soil.

PC.13.2 Topsoil stripping

PC.13.2.1 Soil shall be stripped to the depth indicated in the project specification, or to the depth of the bedrock where soil is shallower than that specified. Herbaceous vegetation, overlying grass and other fine organic matter shall not be removed from the stripped soil.

PC.13.2.2 No topsoil which has been stripped shall be buried or in any other way be rendered unsuitable for further use by mixing with spoil or by compaction by machinery.

PC.13.2.3 Topsoil shall preferably be stripped when it is in a dry condition in order to prevent compaction.

PC.13.3 Topsoil stockpiling

PC.13.3.1 Stripped topsoil shall be stockpiled on sites adjacent to where it has been stripped which have been approved by the Engineer. Soil stockpiles shall not take the form of windrows, unless this can be placed far enough away from the working area. This is to prevent the soil from being spread out or mixed with the other spoil during construction.

PC.13.3.2 No vehicles shall be allowed access onto the stockpiles after they have been placed. Topsoil stockpiles shall be clearly demarcated in order to prevent vehicle access and later for identification as being the resource for rehabilitation and vegetation establishment.

PC.13.3.3 Stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material which may inhibit the later growth of vegetation in the soil.

PC.13.4 Topsoil placement

PC.13.4.1 Topsoil shall be placed to the depth indicated in the project specification over all areas where it has been stripped and over disused borrow pits after construction in those areas has ceased. Topsoil placement shall be done concurrently with construction or as soon as construction in an area has ceased.

PC.13.4.2 Topsoil shall be placed in the same soil zone from which it has been stripped. However, if there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil of similar quality may be bought from other soil zones of similar quality at the approval of the Engineer.

PC.13.4.3 Topsoil shall be mounded and shaped around manholes and valve chambers which protrude above the ground and over the pipeline to facilitate subsequent consolidation of the backfill. The Contractor shall ensure that stormwater run-off is not channelled alongside the gentle mounding, but is taken diagonally across it.

PC.13.4.4 Where insufficient topsoil has been stripped by the Contractor to provide the minimum specified depth, the Contractor shall obtain suitable substitute material from other sources at no cost to the employer. The suitability of the substitute material shall be determined by means of a soil analysis which is acceptable to the Engineer or Environmental Officer.

PC.13.4.5 No vehicles shall be allowed access onto or through topsoil areas after it has been placed.

PC.13.4.6 After topsoil placement is complete, cleared and stockpiled vegetation matter shall be spread randomly by hand over the topsoiled area as instructed by the Engineer.

PC.14 BORROW PITS AND QUARRIES

PC.14.1 If a borrow pit is to be developed or an existing one is to be excavated, all topsoil from the area that is to be quarried must be stripped and stored for later rehabilitation of the pit.

PC.14.2 Stripping and excavation actions shall be progressive in such manner that those parts of the borrow pit or quarry where work is complete can be rehabilitated while other areas are still being quarried.

PC.14.3 Cut slopes of borrow pits and quarries shall have a vertical: horizontal gradient of not steeper than 1:3 (about 18 degrees), and preferably 1:5.

PC.14.4 During excavation, work will be carried out in such a way that slopes of open works are not made dangerously steep.

PC.14.5 Borrow pits shall be used as dump sites for excess rock spoil. On completion of spoiling the pits shall be reshaped and covered with layer of topsoil. On no account may spoil or rock by placed in drainage ways without the prior consent of the Engineer. On sites where old excavations are to be found, rock, waste and mud from new excavations will be used to fill in the old excavations.

PC.14.6 Stormwater cut off drains shall be provided at the top of the cut slope, where identified as necessary by the Engineer, to prevent erosion of the rehabilitated surface of the borrow pit or quarry.

PC.14.7 No borrow pit shall be used as a dump site for refuse material or for toxic material e.g. cement, oil, diesel, rubber and similar materials.

PC.14.8 There will be no workshops, chemical or fuel stores on the borrow pit site.

PC.14.9 Sufficient soil conservation works for preventing soil erosion will be established at the rehabilitated areas.

PC.15 BATCHING

Concrete shall be mixed only in areas which have been specially demarcated for this purpose. All concrete that is spilled outside these areas, shall be promptly removed by the

Contractor and taken to an approved dump site. After all concrete mixing is complete, all waste concrete shall be removed from the batching area and disposed of at an approved dump site. Stormwater shall not be allowed to flow through the batching area. Water laden with cement shall be collected in a retention area for evaporation.

PC.16 EROSION PREVENTION

PC.16.1 The Engineer will instruct the Contractor on the measures to be taken to ensure that there is no undue stormwater damage and soil erosion resulting from the construction activities. The Contractor shall nevertheless take interim measures to ensure that no undue erosion damage occurs and shall advise the Engineer of all potential problem areas.

PC.16.2 Surface stormwater shall, where possible, not be allowed to be concentrated and to flow down cut or fill slopes or along the pipeline route without erosion protection measures being place.

PC.16.3 Stormwater deflection berms or stone pitched channels shall be constructed at regular intervals (plus minus every 15-30m) diagonally across the pipeline servitude on slopes as directed by the Engineer.

PC.17 EARTHWORKS

PC.17.1 All cut and fill forms shall be rounded on the edges to allow them to blend with the surrounding landforms.

PC.17.2 Where the backfill over the pipe trench will impede the natural flow of water, the backfill shall be shaped to allow an even flow across the line.

PC.19 SPOIL AND WASTE MATERIAL

PC.19.1 The Contractor shall load and haul excess spoil to fill in the borrow pits or to dump sites approved by the Engineer. The dumped material must be finally rounded to have slopes not steeper than 1:3.

PC.19.2 The Contractor shall remove all foundations and similar waste and transport all such waste material off site to dump areas which have been approved by the Engineer.

PC.20 REFUSE DISPOSAL

The Contractor shall dispose of all refuse generated by him or his subcontractor on a weekly basis at an approved refuse disposal site.

PC.21 ABLUTION FACILITIES

Portable toilets shall be placed within easy access of the Contractor’s employees. These toilets shall be moved to follow the progression of the Works. Waste generated by these toilets shall be disposed of in an acceptable manner following consultation with the Engineer.

PC.22 CLEARANCE OF SITE ON COMPLETION

PC.22.1 On completion of the Works, the Contractor shall clear away and remove from the works area all constructional plant, signboards, surplus rock and other material, foundations, plumbing and other fixtures, rubbish and temporary works of every kind. Areas thus cleared shall be graded and scarified to restore the ground to its original profile as near as practicable before topsoil placement and re-vegetation.

PC.22.2 The Contractor shall load and haul excess spoil to fill the borrow pits or to dump sites

approved by the Engineer. The dumped material must be finally rounded off to have slopes not steeper than 1:3.

PC.23 ENVIRONMENTAL AWARENESS OF EMPLOYEES

The Contractor shall arrange that all his employees and those of his subcontractors receive environmental awareness and/or training before commencement of construction to the satisfaction of the Engineer, in order that they:

PC.23.1 acquire a basic understanding of the key environmental features of the work site and environs;

PC.23.2 are thoroughly familiar with the requirements of these Environmental Protection and Control Specifications as they apply to the Works;

PC.23.3 if required by the Engineer, receive basic training in the identification of archaeological artifacts, and rare and endangered flora and fauna that may be encountered along the route; and

PC.23.4 are made aware of any other environmental matters which are deemed to be necessary by the Engineer.

PC.24 COMPLIANCE WITH ENVIRONMENTAL PROTECTION SPECIFICATION

PC.24.1 All persons employed by the Contractor or his subcontractors shall abide by the requirements of these specification as they apply to the Works.

PC.24.2 Any employees of the Contractor or his subcontractors found to be in breach of any of the Environmental Protection Specifications may be ordered by the Engineer to leave site forthwith. No extension of time will be granted for any delay or impediment to the Contractor brought about by a person ordered to leave the site.

PC.24.3 Supervisory staff of the Contractor and his subcontractor shall not direct any person to undertake any activities which would place such a person in contravention of the Environmental Protection and Control Specification.

PC.25 COMPLIANCE AND MONITORING

The Engineer shall be responsible for implementing a consistent monitoring programme to ensure that construction specifications are upheld and that negative environmental impacts are regularly assessed and mitigated against.

The Contractor shall obtain written approval from the Engineer that the site is rehabilitated to their satisfaction at the end of the contract (practical closure) as well as after a 12 month liability period (final closure). If, in the opinion of the Engineer, the Environmental Protection and Control Specifications have not been complied with, further rehabilitation measures can be specified, the costs of which will be borne by the Contractor.

PD: PROVISION OF STRUCTURED TRAINING

CONTENTS

Scope

Generic training

Entrepreneurial skills training

In-service training

Measurement and payment

PD.1 SCOPE

This specification covers the requirements for the provision of structured training to be arranged by the contractor over the period of this contract.

PD.2 GENERIC TRAINING

PD.2.1 The contractor shall, from the commencement of the contract, implement a structured progressive training programme.

PD.2.2 The generic training will inter alia comprise, but not be limited to the following subjects:

Course Description	Estimated No. Of Trainees	Estimated Duration (Days)
1. Road safety for construction workers		……
2. Flagmen		……..
3. Concrete handling, placing and finishing		……
4. Guardrails		……
5. Bituminous road surfacing		……

PD.2.3 Training shall be at or by an approved accredited organisation and shall be delivered by suitably qualified and experienced trainers.

PD.2.4 The tenderer shall provide with his tender full details of the structured training programme he intends to implement, which details shall include the following:
(a) The name of the training institution and programme
(b) The manner in which the training is to be delivered.
(c) The numbers and details of the trainers

PD.2.5 The contractor shall be responsible for the provision of everything necessary for the delivery of the generic training programme, including the following:

(a) A suitable venue with sufficient furniture, lighting and power.
(b) All necessary stationery consumables and study material
(c) Transport of the students (as necessary)
(d) Payment of wage to all trainees during the classroom training at a rate equal to the minimum wage as set in the Ministerial Determination for the Expanded Public Works Programme on an annual basis.
(e) relevant PPE required for the project works
(f) Additional supervision of learners during the practical learning stages of the works. Wage for the leaners during this stage of the training will be paid through the outputs.

PD.2.6 Generic training courses shall commence within one month of possession of site and be completed before the end of the contract period.

PD.2.7 The contractor's training programme shall be subject to the approval of the engineer, and the contractor shall if so instructed by the engineer alter or amend the programme and course content if a need is identified once the contract commences.

PD.2.8 The contractor shall keep comprehensive records of the training given to each student and whenever required shall provide copies of such records to the engineer. At the successful completion of each course each student shall be issued with a certificate indicating the course contents as proof of attendance and completion.

In addition to the above, a monthly return shall be submitted by the contractor.

PD.3 ENTREPRENEURIAL SKILLS TRAINING

PD.3.1 Small contractors and subcontractors will be entitled to receive a structured training programme, which will comprise both management skills as well as business development skills.

PD.3.2 The contractor shall closely monitor the performance of all small subcontractors in the execution of their contracts and shall identify all such subcontractors who, in his opinion, display the potential to benefit from structured training as may be provided for in the contract and where required by the engineer, shall make recommendations in this regard. The final list of candidates will be decided between the contractor and the engineer.

PD3.3 The training will be delivered by trainers who are accredited by the Civil Engineering Training Scheme (CEITS) or other institutions recognised by the Department of Labour. Accredited training refers to both the trainers as well as to the training material.

PD3.4 The contractor shall facilitate in the delivery thereof, by instructing and motivating the subcontractor regarding attendance and participation therein.

PD.3.5 The contractor shall further make all reasonable efforts to co-ordinate the programming of the subcontractor.

PD.3.6 The structured training will comprise out of the following as decided by the Employer:

Course Description	Estimated Duration (Days)
1. Basic Business Principles	……
2. Basic Supervision	……..
3. Running A Business	……
4. Legal Principles	……
5. Achieving Standards	……

PD.3.7 The contractor shall provide with his tender, full details of the structured training programme, which he intends to implement, which details shall include the following:
(a) The name of the training institution and programme
(b) The various aspects of each type of training comprised in the programme
(c) The manner in which the training is to be delivered
(d) The numbers and details of the trainers to be utilised.

PD.3.8 The contractor shall be responsible for the provision of everything necessary for the delivery of the entrepreneurial training programme, including the following:
(a) A suitably furnished venue (if required) with lighting and power.
(b) All necessary consumables, stationery and study material
(c) Transport of the subcontractors (as necessary)

PD.3.9 All entrepreneurial training shall take place within normal working hours.

PD.3.10 The contractor's training programme shall be subject to the approval of the engineer, and the contractor shall if so instructed by the engineer alter or amend the programme and course content if a need is identified once the contract commences.

PD.3.11 The contractor shall keep comprehensive records of the training given to each subcontractor and whenever required shall provide copies of such records to the engineer. At the successful completion of each course each subcontractor shall be issued with a certificate indicating the course contents as proof of attendance and completion.

In addition to the above, a monthly return shall be submitted by the contractor

PD.4. IN SERVICE TRAINING

PD.4.1 The contractor shall in addition to the structured (accredited) training as provided for in Part C of this document implement an in-service training programme, from the commencement of the contract, in which the various skills required for the execution and completion of the works are imparted to the labourers engaged thereon, in a programmed and progressive manner. Labourers shall be trained progressively throughout the duration of the contract, in the various stages of a particular type of work.

PD.4.1.1 Details of in-service training

(i) The contractor shall attach to applicable returnable form the basic details of his proposed in- service training programme, which details shall inter alia include the following:

- the details of training to be provided
- the manner in which the training is to be delivered
- the number and details of trainers to be utilised.

(ii) The in-service training programme shall be submitted with the initial works programme. The progress in relation to this programme will be recorded monthly and attached to the site meeting minutes and payment certificate.

(iii) The contractor shall provide on site, sufficient skilled and competent trainers to train all labourers engaged on the contract, in the various skills required for the execution and completion of the works.

(iv) All labourers shall be remunerated in respect of all time spent undergoing training.

(v) Every worker engaged on the contract shall on the termination of his participation on the contract, be entitled to receive from the contractor, a certificate of service in which the following information shall be recorded:

- the name of the contractor
- the name of the employee
- the name of the project/contract
- the nature of the work satisfactorily executed by the worker and the time spent thereon
- the nature and extent of training provided to the worker
- the dates of service.

(vi) The cost of the above obligations shall be deemed to be covered by the sums and rates tendered for items B13.01(a), (b) and (c) in the bill of quantities. The performance of the contractor in providing in-service training, shall be taken into consideration should the contractor fail to reach his CPG at the completion of the project.

PD.4.1.2 Lead time for training

The training of labour as specified shall, as far as possible, take place before commencement of each activity and the contractor shall take into account in his programme the lead-time he requires for such training. All training herein specified shall be deemed to be a construction activity and a non-negotiable condition of the contract". All formal training is to be documented in terms of the National/Provincial submission forms, and accompanied by an attendance register for the applicable days.

PD.5 MEASUREMENT AND PAYMENT

	ITEM	**UNIT**
E12.05 Provision for training		
(a)	Generic skills Provisional (list training courses)	sum
(b)	Entrepreneurial skills Provisional	sum

(c) Handling cost and profit in respect of sub-item E12.05(a) and (b) above percentage (%)

(d) Training venue (only if required) lump sum
(e) Transport and accommodation of workers for training where it is not possible to undertake the training in close proximity to the site. (provisional sum) sum
(f) Additional supervision during practical training
Lump sum

The prime cost sums are provided to cover the actual costs (including wages, tools and PPE) for attendance of accredited training courses as agreed with the engineer and shall be expended in accordance with the provisions of sub-clause 48(2) of the general conditions of contract. The tendered percentage in sub-item 4.1(c) is a percentage of the amount actually spent under sub-items 4.1(a) and (b) which shall include full compensation for the contractor's handling cost, profit, mentoring, record keeping, reporting and all other costs in connection therewith.

The lump sum tendered for 4.1(d) shall include full compensation for the provision of the training venue, for all necessary lighting, power, furniture, stationery, consumables and study material and for transportation of the students to and from the training venue. Payment of the lump sum will be made in two instalments as follows:

(i) The first instalment, 75% of the lump sum, will be paid after the contractor has met all his obligations regarding the provision of the training venue as specified.

(ii) The second and final instalment, 25% of the lump sum, will be paid after the provision of all the accredit training as specified in the document.

The lump sum tendered for 4.1 (e) shall include full compensation for the provision of additional supervisory staff to manage the output generated from the learners during practical training.

B3 PME/1 PUMPS & MECHANICAL EQUIPMENT - PROJECT SPECIFICATION

PUMPING PLANT

PART 1 GENERAL

1.01 SCOPE OF WORK

The scope of the work is the manufacture, supply, delivery, installation, testing, commissioning, maintaining and guarantee of the following pumping plant, grinder and associated equipment as per the following specifications :

1.01.1 Hoof Sewer Pump Station 1 :

- Manufacture, supply and delivery and installation of new AP1 – Cornell self priming sewage pumps and motors. The 2 installed pumps shall operate as 1 duty and 1 stand-by.
- Supply and installation of the suction pipework from the wet well or sump to the pump suction
- Supply and installation of in-channel grinder
- Supply and installation of pressure gauges
- FAT and SAT for the pumps to be included
- Testing and commissioning of all the pumping systems and grinder including assisting with testing of the main sewer rising main pipeline
- Provide O & M manuals

1.01.2 Beta Metal Sewer Pump Station 2 :

- Manufacture, supply and delivery and installation of new Gorman Rupp self priming sewage pumps and motors. The 2 installed pumps shall operate as 1 duty and 1 stand-by.
- Supply and installation of the suction pipework from the wet well or sump to the pump suction
- Supply and installation of in-channel grinder
- Supply and installation of pressure gauges
- FAT and SAT for the pumps to be included
- Testing and commissioning of all the pumping systems and grinder including assisting with testing of the main sewer rising main pipeline
- Provide O & M manuals

1.01.3 SPECIFICATIONS AND PUMPING PLANT AND EQUIPMENT REQUIREMENTS :

1.01.4.1 Hoof Sewer Pump Station 1

The pumps are to match the Cornell that was installed in the pump station previously which was vandalized. The sewer pumps required are 2 x API - Cornell solids handling self priming pumps on a duty and stand-by basis. The duty point of each shall be 78l/s at a head of 20.4m. The pump shall be an API - Cornell Type 85TL-F-22 vane 76mm solids. The pump set shall be complete with galvanized fabricated channel base plates, with v-belt pulleys and belts driven via a 30kW 4P - 1350 RPM 400V 50Hz IP66 IE4 W22 WEG motor including pulleys and belt guards. The pump set shall be supplied with a Cornell approved automatic release valve per pump set, static discharge head to be advised before ordering to ensure correct spring set is fitted. All guards are to be 3CR12 epoxy powder coated.
The pumps shall be capable for solids handling of 76mm diameter.

The pumps shall be supplied complete with the hot dipped galvanized suction pipe including bellmouth starting from the sewer wet well / sump to the suction side of the pump. The final size and length of the suction pipe shall be determined by the pump supplier.

The NPSRr required by the pump and the total lift required with the pump on-off levels shall be determined by the pump supplier in conjunction with the Engineer. The NPSHr etc shall also be determined by the invert level of the sewer line inlet into the wet well/sump.

The pump supplier shall refer to the civil layouts and pump station plans to determine the final pumping and NPSRr requirements.

The pumps and motors are to be laser aligned or other approved aligning method is to be used.

1.01.4.2 Beta Metal Sewer Pump Station 2

The pumps required are 2 x Gorman Rupp self priming pumps on a duty and stand-by basis. The duty point of each pump shall be 30.4 l/s at a head of 20.17m. The pump shall be a Gorman Rupp T - Series Type TA60S-B/FM. The pump set shall be complete with galvanized fabricated channel base plates, with v-belt pulleys and belts driven via a 18,5kW 4P - 1247 RPM 400V 50Hz IP66 IE3 (Min) W22 WEG motor including pulleys and belt guards. The pump set shall be supplied with Gorman Rupp GRP33-07 or similar automatic release valve per pump set, static discharge head to be advised before ordering to ensure correct spring set is fitted. All guards are to be 3CR12 epoxy powder coated.

The pumps shall be capable for solids handling of 76mm diameter.

The pumps shall be supplied complete with the hot dipped galvanized suction pipe including bellmouth starting from the sewer wet well / sump to the suction side of the pump. The final size and length of the suction pipe shall be determined by the pump supplier.
The NPSRr required by the pump and the total lift required with the pump on-off levels shall be determined by the pump supplier in conjunction with the Engineer and Civil/Hydraulic Engineer. The NPSHr etc shall also be determined by the invert level of the sewer line inlet into the wet well/sump.

The pump supplier shall refer to the civil layouts and pump station plans to determine the final pumping and NPSRr requirements.

The pumps and motors are to be laser aligned or other approved aligning method is to be used.

1.01.4.4 General

- All pumps and motors are to be tested to ISO 9906 Grade 2B.
- Full specifications, pump curves and data sheets are to be submitted at the time of tendering.
- All the pumps and motors are to be factory tested ie FAT to be conducted with the Engineer in attendance.

1.01.4.5 The following hydraulic details and pumping rates and duties as provided by the Civil Engineer for information purposes :

1.01.4 Drawings

The following civil drawings are issued with and form part of the specifications and are to be read in conjunction with this specification at all times. The onus is on the tender to ensure he understands what the requirements are as no extras or variations will be entertained for lack of knowledge of the specifications or site conditions.

NB : The mechanical and civil drawings are not available for the tender, but will be made available during the construction stages. The civil drawings may be made available during the tender period, but this is not guaranteed.
It is advisable that the tenderers visit the sites to acquaint themselves with site conditions, as no additional costs will be entertained due to lack of information or drawings.

1.01.6 Pump supplier to confirm and provide the following :

- Full technical details, pump curves and brochures, weights, dimensions etc for the self priming pumps
- The technical data sheets Annexure A at the back of this specification is to be completed and submitted for each pump station or for the each different type of pump/s
- The following are required for the pumps:
    - Full technical details, pump curves and brochures for the pumps
    - Pump supplier to confirm pump duties and head and if these capacities or duties are achievable. Clarity is to be discussed/confirmed with the Engineer before submission of tenders
    - Type and dimensions of pump suction and discharge and other fittings
    - Type of motor starting and controls
    - Type of motor cooling
    - Net weight and dimensions for the set complete
- All other details or information the pump supplier deemed necessary to submit
- Note that the above details will be used in the evaluation of the tenders submitted

Note :

a) Preferred supplier of the self priming pumps shall be API - Cornell for the Hoof Pump Station 1 (to suit existing vandalized pumps) as per Client' preference and to suit Client requirements. All alternatives must be approved prior to tenders closing
b) Preferred supplier of the self priming pumps shall be Gorman Rupp for Beta Metal Pump Station 2 as per Client' preference and to suit Client requirements. All alternatives must be approved prior to tenders closing

NB : The supply and installation of all pipes and fittings, isolations valves , non-return valves etc is excluded from the pump supply and will form part or other specialist or civil contractor's scope of work.

1.01.7 Self Priming Pumps – General

- The self priming pumps shall be type Cornell for Hoof Pump Station 1 and Gorman Rupp for Beta Metal Pump Station 2 or similar and equal approved. The pump duties are as specified above
- The motors shall be minimum IE3 efficiency Class H insulation
- Pumps are to be designed for pumping large volumes of un-screened sewer or wastewater capable of handling solids of up to min 70mm in size. (80mm preferred)
- The pumps will operate on a duty and stand-by basis as specified above. The stand-by pump shall be automatically activated should the duty pump fail. However both pumps can operate simultaneously should the level in the sump rise faster that the set points.
- The pump shall include the following :
    - Ductile iron impellor - Diameter to be specified and selected by supplier to meet the duty points
    - Discharge diameter - Diameter to be specified and selected by supplier
    - Inlet diameter - Diameter to be specified and selected by supplier
    - Installation type - T Vertical permanent dry
    - Max fluid temperature - 40℃
    - S1 Duty
    - Speed – Selected by supplier
    - Full load PF - Best PF to be selected and specified by supplier
    - Efficiency at full load - Best efficiency at duty point to be selected and specified by
    - Cables to be sized for maximum volt drop of 0,5%
- Pumps shall be operated on VSDs or soft starters. Motors shall be selected and wired accordingly
- Duty pumps operated independently via levels in the sump/wet well
- Pumps shall be fitted with anti-condensate heaters

- Pumps are to be fitted with 3 (three, one per phase) thermal PT100 sensors for protection of motor winding temperature overheating
- All sensors shall be supplied complete with built-in cables of 15m lengths capable of reaching the MCC and drives OR cable junction boxes
- Details of the pump casing, impellor, motor casing and all other information etc shall be provided in the attached annexures to be provided by the pump supplier.

1.01.7.1 PERFORMANCE CRITERIA

a) The pump manufacturer must be ISO 9001:2008 revision certified, with scope of registration including design control and service after sales activities.

b) The pump manufacturer must be registered to the ISO 14001 Environmental Management System standard and as such is committed to minimizing the impact of its activities on the environment and promoting environmental sustainability using best management practices, technological advances, promoting environmental awareness and continual improvement.

c) Pumps must be designed to handle raw, unscreened, domestic sanitary sewage. Pumps shall have 3” suction connection, and 3” discharge connection or to suit the pump offered. The details of the suction and discharge connections are to be supplied with the pump offered and included with the tender.

d) .Pump Performance Certifications

1. The pumps shall have a solids management system designed for management of sanitary wipes, plastic bags, feathers, hair, sludge, and all other types of stringy solids.

2. Solids Handling Capability

- All internal passages, impeller vanes, and recirculation ports shall pass a 70mm (min) spherical solid. Smaller internal passages that create a maintenance nuisance or interfere with priming and pump performance shall not be permitted. Upon request from the Engineer, manufacturer’s certified drawings showing size and location of the recirculation port(s) shall be submitted for approval.

e) .Reprime Performance

1. Consideration shall be given to the sanitary sewage service anticipated, in which debris is expected to lodge between the suction check valve and its seat, resulting in the loss of the pump suction leg, and siphoning of liquid from the pump casing to the approximate center line of the impeller. Such occurrences shall be considered normal, and the pump must be capable of automatic, unattended operation with an air release line installed.

2. During unattended operation, the pump shall retain adequate liquid in the casing to ensure automatic repriming while operating at its rated speed in a completely open system. The need for a suction check valve or external priming device shall not be required.

3. The pump suction check valve shall be removed. No restrictions in the pump or suction piping will prevent the siphon drop of the suction leg

4. Impeller clearances shall be set as recommended in the pump service manual.

5. Repeatability of performance shall be demonstrated by testing five consecutive reprime cycles. Full pump capacity (flow) shall be achieved within five minutes during each cycle.

6. Liquid to be used for reprime test shall be water.

7. Upon request from the Engineer, certified reprime performance test results, prepared by the manufacturer, and certified by a registered professional engineer, shall be submitted for approval prior to shipment.

8. FAT (Factory Acceptance Tests) to be performed at the manufacturer's premises witnessed by the Engineer.
All costs for the tests including all costs for the Engineer to attend shall be allowed in the pricing. This is to include all flights , visas, transfers, travel, car hire, fuel costs, accommodation, meals and entertainment, insurances etc complete.

f) .Certified Pump Performance Test

1. Tests shall be conducted in accordance with Hydraulic Institute Standards 14.6.3.4 Acceptance Grade 2B at the specified head, capacity, rated speed, and horsepower. The performance tests will validate the correct performance of the equipment at the design head, capacity, and speed.

2. For pumps utilizing up to (10 kW) motors; but larger than (1.0 kW), tests shall be conducted in accordance with Hydraulic Institute Standards 14.6.3.4.1, at the specified head, capacity, rated speed, and horsepower.

g) .Manufacturer's Warranty

1. The pump manufacturer shall warrant the pump equipment to be of quality construction, free of defects in material and workmanship. A written warranty shall include specific details described below.

2. All equipment, apparatus, and parts furnished shall be warranted for sixty (60) months, excepting only those items that are normally consumed in service, such as oils, grease, packing, gaskets, O-rings, etc. The pump manufacturer shall be solely responsible for warranty of the pump equipment and all components.

3. Components failing to perform as specified by the Engineer, or as represented by the manufacturer, or as proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer.

4. It is not intended that the pump manufacturer assume liability for consequential damages or contingent liabilities arising from failure of any vendor supplied product or part which fails to properly operate, however caused. Consequential damages resulting from defects in design, or delays in delivery are also beyond the manufacturer's scope of liability.

5. This limited warranty shall be valid only when installation is made and use and maintenance is performed in accordance with manufacturer's recommendations. The warranty shall become effective on the date of acceptance by the purchaser or the purchaser's authorized agent, or sixty (60) days after installation, whichever occurs first. This warranty effective date and period is to be confirmed with the Client and Engineer.

1.01.7.2 Pump Manufacturer

a) The specifications and project drawings depict equipment and materials manufactured by the pump manufacturer which are deemed most suitable for the service anticipated. It is not intended, however, to eliminate other products of equal quality and performance. The contractor shall prepare his bid based on the specified equipment for purposes of determining a low bid. Award of a contract shall constitute an obligation to furnish the specified equipment and materials.

b) After execution of the contract, the contractor may offer substitutions to the specified equipment for consideration. The equipment proposed for substitution must be superior in construction and

performance to that specified in the contract, and the higher quality must be demonstrated by a list of current users of the proposed equipment in similar installations.

c) In event the contractor obtains Engineer's approval for equipment substitution, the contractor shall, at his own expense, make all resulting changes to the enclosures, buildings, piping or electrical systems as required to accommodate the proposed equipment. Revised detail drawings illustrating the substituted equipment shall be submitted to the engineer prior to acceptance.

d) It will be assumed that if the cost to the contractor is less for the proposed substitution, then the contract price shall be reduced by an amount equal to the savings.

1.01.7.3. Pump Design

a) Pumps shall be horizontal, self-priming centrifugal type, designed specifically for handling raw, unscreened, domestic sanitary sewage. Pump for solids handling capability and performance criteria shall be in accordance with requirements listed under PART 1 - GENERAL of this section.

b) The pump manufacturer must be ISO 9001:2008 revision certified, with scope of registration including design control and service after sales activities.

c) Materials and Construction Features

Pump casing shall be cast iron Class 30 with integral volute scroll. Casing shall incorporate following features:

1. Mounting feet sized to prevent tipping or binding when pump is completely disassembled for maintenance.
2. Fill port cover plate, 3 1/2" diameter, shall be opened after loosening a hand nut/clamp bar assembly. In consideration for safety, hand nut threads must provide slow release of pressure, and the clamp bar shall be retained by detente lugs. A Teflon gasket shall prevent adhesion of the fill port cover to the casing.
3. Casing drain plug shall be at least 1 1/4" NPT to insure complete and rapid draining.
4. Liquid volume and recirculation port design shall be consistent with performance criteria listed under PART 1 - GENERAL of this section.

d) Coverplate assembly shall be cast iron Class 30. Design must incorporate following maintenance features:

1. A lightweight inspection cover plate, retained by acorn nuts, for access to pump interior for removal of stoppages. Designs that require removal of complete cover plate assembly for access to the impeller will not be accepted.

2. Retained by acorn nuts for complete access to pump interior. Back cover plate removal must allow service to the impeller, seal, wear plate or check valve without removing suction or discharge piping. Back cover plate shall incorporate an obstruction free flow path by combining four support posts into a two-point “webbed” plate design for increased durability, reduced clogging, and increased operational efficiency.

e) Aggressive Self-Cleaning Wear Plate

1. A replaceable wear plate secured to the back cover plate by studs and nuts. Wear plate shall be self-cleaning design ensuring that debris is cleared away and does not collect on the impeller vanes.

2. The nature of the conveyed medium poses significant challenges to the continuous operation of the pump. Of particular concern is the clogging of the impeller by debris in the pumped medium including but not limited to long rags, fibers, and like debris which are able to wrap around the impeller vanes, stick to the center of the vanes or hub, or lodge within the spaces between the impeller and the housing.

3. The aggressive self-cleaning wear plate shall have integral laser cut notches and grooves in combination with a “tooth” designed to disturb and dislodge any solids which might otherwise remain on the impeller in dynamic operation. Wear plate is designed to clear the eye of the impeller constantly and effectively without the use of blades or cutters.

f) In consideration for safety, a pressure relief valve shall be supplied in the inspection cover plate. Relief valve shall open at 75-200 PSI.

g) One O-ring of Buna-N material shall seal inspection cover plate to back cover plate.

h) Two O-rings of Buna-N material shall seal back cover plate to pump casing.

i) Pusher bolt capability to assist in removal of inspection cover plate or back cover plate. Pusher bolt threaded holes shall be sized to accept same retaining cap screws as used in rotating assembly.

j) Easy-grip handle shall be mounted to face of inspection cover plate.

k) Rotating assembly, which includes impeller, shaft, mechanical shaft seal, lip seals, bearings, seal plate and bearing housing, must be removable as a single unit without disturbing the pump casing or piping. Design shall incorporate following features:

1. Seal plate and bearing housing shall be cast iron Class 30. Separate oil filled cavities, vented to atmosphere, shall be provided for shaft seal and bearings. Cavities must be cooled by the liquid pumped. Three lip seals will prevent leakage of oil.

   - The bearing cavity shall have an oil level sight gauge and fill plug check valve. The clear sight gauge shall provide easy monitoring of the bearing cavity oil level and condition of oil without removal of the fill plug check valve. The check valve shall vent the cavity but prevent introduction of moist air to the bearings.
   - The seal cavity shall have an oil level sight gauge and fill/vent plug. The clear sight gauge shall provide easy monitoring of the seal cavity oil level and condition of oil without removal of the fill/vent plug.
   - Double lip seal shall provide an atmospheric path providing positive protection of bearings, with capability for external drainage monitoring.

2. Impeller shall be ductile iron, two-vane, semi-open, non-clog, with integral pump out vanes on the back shroud. Impeller shall thread onto the pump shaft and be secured with a lock screw and conical washer.

3. Shaft shall be AISI 4150 alloy steel unless otherwise specified by the engineer, in which case AISI 17-4 pH stainless steel shall be supplied. Stainless steel is preferred.

4. Bearings shall be anti-friction ball type of proper size and design to withstand all radial and thrust loads expected during normal operation. Bearings shall be oil lubricated from a dedicated reservoir. Pump designs which use the same oil to lubricate the bearings and shaft seal shall not be acceptable.

5. Shaft seal shall be cartridge oil lubricated mechanical type. The stationary and rotating seal faces shall be tungsten titanium carbide alloy. Each mating surface shall be lapped to within three light bands flatness (35 millionths of an inch), as measured by an optical flat under monochromatic light. The stationary seal seat shall be double floating by virtue of a dual O-ring design; an external O-ring secures the stationary seat to the seal plate, and an internal O-ring holds the faces in alignment during periods of mechanical or hydraulic shock (loads which cause shaft deflection, vibration, and axial/radial movement). Elastomers shall be Viton; cage and spring to be stainless steel. Seal shall be oil lubricated from a dedicated reservoir. The same

oil shall not lubricate both shaft seal and shaft bearings. Seal shall be warranted in accordance with requirements listed under PART 1 - GENERAL of this section.

6. Pusher bolt capability to assist in removal of rotating assembly. Pusher bolt threaded holes shall be sized to accept same caps crews as used for retaining rotating assembly.

l) Adjustment of the impeller face clearance (distance between impeller and wear plate) shall be accomplished by external means.

1. Clearances shall be maintained by a four-point external shimless cover plate adjustment system, utilizing a four collar and four adjusting screw design allowing for incremental adjustment of clearances by hand as required. Each of the four points shall be lockable to prevent inadvertent clearance increases or decreases due to equipment vibration or accidental operator contact. The four-point system also allows for equal clearance gaps at all points between the impeller and wear plate. Requirement of realignment of belts, couplings, etc., shall not be acceptable. Coverplate shall be capable of being removed without disturbing clearance settings. Clearance adjustment systems that utilize less than four points will not be considered.

2. There shall be provisions for additional clearance adjustment in the event that adjustment tolerances have been depleted from the cover plate side of the pump. The removal of stainless-steel shims from the rotating assembly side of the pump shall allow for further adjustment as described above

3. Clearance adjustment which requires movement of the shaft only, thereby adversely affecting seal working length or impeller back clearance, shall not be acceptable.

m) Suction check valve shall be molded Neoprene with integral steel and nylon reinforcement. A blow-out center shall protect pump casing from hydraulic shock or excessive pressure. Removal or installation of the check valve must be accomplished through the cover plate opening, without disturbing the suction piping. Sole function of check valve shall be to save energy by eliminating need to reprime after each pumping cycle. Pumps requiring a suction check valve to assist reprime will not be acceptable.

n) Serviceability

1. The pump manufacturer shall demonstrate to the Engineer's satisfaction that consideration has been given to reducing maintenance costs.

2. No special tools shall be required for replacement of any components within the pump.

3. Spool flanges shall be one-piece cast iron, class 30 fitted to suction and/or discharge ports. Each spool shall have one 1-1/4" NPT and one 1/4" NPT tapped hole with pipe plugs for mounting gauges or other equipment.

1.01.7.4 Execution

a) EXAMINATION

1. Contractor shall off-load equipment at installation site using equipment of sufficient size and design to prevent injury or damage. Immediately after off-loading, the contractor shall inspect complete pump and appurtenances for shipping damage or missing parts. Any damage or discrepancy shall be noted in a written claim with shipping company prior to accepting delivery. Validate all pump serial numbers and parts lists with shipping documentation. Notify the manufacturer’s representative of any unacceptable conditions noted with shipper.

b) INSTALLATION

1. Install, level, align, and lubricate pump(s) as indicated on project drawings. Installation must be in accordance with written instructions supplied by the manufacturer at time of delivery.

2. Suction pipe connections are vacuum tight. Fasteners at all pipe connections must be tight. Install pipe with supports and thrust blocks to prevent strain and vibration on pump piping. Install and secure all service lines (level control, air release valve or pump drain lines) as required in wet well.

3. Check motor and control data plates for compatibility to site voltage. Install and test the station ground prior to connecting line voltage to control panel.

4. Prior to applying electrical power to any motors or control equipment, check all wiring for tight connection. Verify that protective devices (fuses and circuit breakers) conform to project design documents. Manually operate circuit breakers and switches to ensure operation without binding. Open all circuit breakers and disconnects before connecting utility power. Verify line voltage, phase sequence and ground before actual start-up.

5. After all anchor bolts, piping and control connections are installed, completely fill the grout dam in the pump station base with non-shrink grout.

c) FIELD QUALITY CONTROL

1. Operational Test

- Prior to acceptance by owner or Client, an operational test of all pumps, drives, and control systems shall be conducted to determine if the installed equipment meets the purpose and intent of the specifications. Tests shall demonstrate that all equipment is electrically, mechanically, structurally, and otherwise acceptable; it is safe and in optimum working condition; and conforms to the specified operating characteristics.

- After construction debris and foreign material has been removed from the wet well, contractor shall supply clear water volume adequate to operate station through several pumping cycles. Observe and record operation of pumps, suction and discharge gage readings, ampere draw, pump controls, and liquid level controls. Check calibration of all instrumentation equipment, test manual control devices, and automatic control systems. Be alert to any undue noise, vibration, or other operational problems.

1.02 REFERENCE STANDARDS

The following standards are referred to in this Clause :

<u>For 50 Hz pumps</u>

- Machinery Directive (2006/42/EC). Standard used: EN 809: 1998 + A1: 2009.
- Low Voltage Directive (2014/35/EU). Standard used: EN 60204-1: 2006 + A1: 2009.
- EMC Directive (2014/30/EU)
- ATEX Directive (2014/34/EU)
- Standard of enclosure class (IP) (IEC 60529).
- Referenced vibration standards: ISO5199:2002 and ISO10816
- DIN flange standard (EN-1092-2): Pressure stage PN 10

1.03 Performance curves and factory testing:

2. For the pump(s) in question, the pump manufacturer shall supply a complete performance curve document in a readable size.

3. All performance curves shall be according to ISO 9906:2012 Grade 3B or ANSI/HI 11.6:2012 grade 3B and the curves shall be documented in a test report delivered with the pump/s specified.
4. Performance and system curves of the pumps shall be supplied with a readable large scale, which shall show the capacity of the pumps under single and multi-pump operation at the duty point/s
5. When tested at the manufacturer's facility, the pump(s) shall be tested based on system specific duty points (on request)
6. The pumps shall be factory tested prior to dispatch to site. Where requested, the Engineer and Client shall be invited to witness such tests and accept same. All costs for same shall be to the pump supplier's or contractor's costs.

2.01 ELECTRIC MOTORS

A. The motors are to be standard cast iron squirrel cage induction type for LV Motors and electrical installations which are to comply to the Municipality requirements or relevant SANS,ISO,IEC,BS standards etc

B. All motors shall be suitable for operating at a power supply of 400Volts, 50 Hz, 3 phase, AC supply. Motors shall be capable of giving rated output without reduction in the expected life span when operated continuously under the following supply conditions.

- Variation of supply voltage from the rated motor voltage +/- 10%
- Variation of supply frequency from the rated frequency +/- 2%

The motors shall not be overloaded at any point of the performance curves. The pump/s shall have a service factor of 1.10 (+10%) in 50 Hz – and 1.15 (+15%) in 60 Hz applications.

C. All motors shall be capable of starting as follows :
- Frame size 50 - 70 max. 20 times per hour.
- Frame size 72 max. 15 times per hour.
- Frame size 74 – 78 max. 10 times per hour.

For this project the motors shall be started for a maximum of 10 times per hour.

D. The pump/s motor/s shall be configured suitable for variable speed drive/s or soft starters. This is a requirement.

E. Motor/s shall be capable of starting and accelerating the load with the applicable method of starting without exceeding the acceptable winding temperatures, when the supply voltage is in the range of 10% above of the rated motor voltage.

F. Motor/s shall be designed to withstand 120% of the rated speed for two minutes without any mechanical damage in either direction of rotation.

G. The insulation class of motor winding shall conform to class – F (155°C/311°F)
Frame size 50 – 72 Temperature rise class F (105K)
Frame size 74 – 78 Temperature rise class B (80K)

H. Base plates or mounting supports shall be manufactured from mild steel plate of adequate thickness and be hot dipped galvanized to SABS1463. The base plates must allow the pump and motor to be easily removed without removing any part of the suction or delivery pipework.

2.02 PAINTINGS, SURFACE PREPARATION AND LABELS

Coatings and surface protection shall be provided as follows:

A. All parts of the pump and motor shall be 100% holiday free epoxy coated and the process followed should be in line as stated below:

1. Cleaning: Sand blast SA 2 ½ at the foundry
2. Grease and rust removing with solvent
3. Primary paint layer: Epoxy 40 microns at foundry
4. Finishing paint layer: Dry film thickness 150 microns
5. Paint: Temacoat HB 30, two-component resin modified epoxy paint or similar and equal approved as supplied by the manufacturer
6. Colour: (to be confirmed prior to manufacture)

B. Labels

Industry standard engraved durable name plate labels shall be firmly fixed to the pumps and motors indicating all data, specifications and information of the pumps and motors. The labels shall be made of aluminum plate and be clearly legible.

2.03 CONTROLS, SENSORS & MONITORING (Refer to electrical specifications for more details)

The pumps shall be provided with proprietary monitoring and control units for inclusion in the motor controls supplied strictly by the motor control panel manufacturer. In certain instances, they shall be included by the pump manufacturer. (where specified)

The following shall be supplied with the pump and motor :

A. Motor winding temperature sensors

B. Motor anti-condensate heaters

The controller with VSDs or soft staters must be able to provide the functionality and control of the pumps and motors as specified under the electrical and control section of the project specifications.

2.04 INSPECTION & TESTING

A. Each pump shall be tested at the manufacturer's premises for the full operating range of the pump. The testing of the pump shall be done according to a testing standard that is equal to ISO 9906:2012 Grade 3B or ANSI/HI 11.6:2012 grade 3B .
Tests shall be carried out at rated speed with minimum NPSH available at site. Pump performance shall be within the tolerance limits specified in the above test standards.

B. To ensure proper operation of the pumps, the pump contractor shall test and adjust all equipment after construction is completed. Pumps and motors shall be aligned and balanced on site as per the manufacturer's specifications/recommendations

C. The pump manufacturer shall supply a test report of the pump specified or selected.

D. Where specified/required, the factory pump performance test for each pump type shall be carried out at the supplier's or manufacturer's premises and is to be witnessed by the Engineer and Client for conformance and acceptance. The costs (flights , travel , accommodation, meals etc for the Engineer and Client) etc shall be borne and paid by the pump supplier or contractor.

E. The pumps shall be tested on site (SAT), with the manufacturer or supplier being present to test the pumps in the presence of the Client and Engineer. The SAT of the pumps is to be verified and confirmed against the specifications and duty of the pumps. The SAT tests shall be recorded in a well documented format.

2.05 DOCUMENTATION

A. Submittals for approval: The pump manufacturer shall also provide the following for approval.

1. Pump Data Sheets
2. Pump civils and building requirements and layouts including any holding down bolt details
3. Performance curves
4. System curves
5. Pump CAD drawings.
6. As built drawings and layouts
7. Installation and operating instructions
8. Pump testing and commissioning data sheets
9. Operating and maintenance manuals (O & M manuals) - 5 copies in both hard and soft copies

B. The O & M manuals shall comprise the following as a minimum, only the relevant portions applicable to the specific scope of work shall apply :

- Electrical COC's (one for each MCC, DB and for each building or structure)
- Earth test certificates
- As built DB and MCC layouts and wiring diagrams
- As built motor control panel layouts and wiring diagrams including component lists
- MCC quality control and test reports
- Factory routine test certificates (SANS1473-1)
- Partial type test certificates for MCC over 10kA
- MCC paint thickness certificate
- FAT & SAT inspection and test reports
- Instrumentation equipment and details (flow meters, actuators, solenoid valves etc complete)
- Programmable and manual parameters of all electronic and instrumentation equipment
- Instrumentation and electrical devise settings and set-points
- As built FDS (control functional design specification and operational specification)
- Cable specifications and cable schedule
- PLC, HMI and telemetry specifications
- PLC and HMI program
- Process control network diagrams
- PLC, HMI and telemetry wiring diagrams
- Telemetry equipment and layout drawings and diagrams
- All equipment specifications and literature with brochures including cables, lights etc
- Cable block diagrams
- Instrument loop and block diagrams
- Specifications and details of all electrical equipment used on the project including literature and brochures. To include transformers, LV & MV equipment etc.
- Details of all pumping plant, valves, pumps, motors and other mechanical equipment used on the project
- Details of all instruments used on the project (flow meters, level sensors, level floats, flow switches, pressure switches etc)
- Details of all dosing pumps and other equipment used on the project
- All maintenance and servicing schedules of all electrical, instrumentation and mechanical equipment
- The operating and maintenance instructions for all electrical, instrumentation and mechanical equipment, valves, pumps, motors etc
- OEM manuals of all mechanical, electrical and instrumentation equipment
- Fault finding procedures and instructions
- Supplier details of all major equipment

- QCPs of all equipment
- Calibration certificates of instruments and other equipment
- Guarantee certificates
- Pipework and plant drawings
- As built drawings and site and building cable schematics and layouts
- Training shall be provided to the Client's operational and maintenance staff

PART 3 PUMPS - EXECUTION

3.01 INSTALLATION AND TRAINING

A. The equipment shall be installed in accordance with the manufacture's installation and operating instructions.

B. The pump supplier and contractor shall provide training for the plant or facilities operations and maintenance personnel. Allowance shall be made to train four persons.

3.02 WARRANTY, MAINTENACE ETC

A. To ensure a valid warranty, all pump sets shall be supplied directly by a manufacturer or by a duly authorized and licensed supplier who shall provide the manufacturer's warranty and services for the pump sets.

B. The pumps, grinders and associate mechanical equipment is to be guaranteed for a period of 12 months from the practical completion and hand-over date. Maintenance and servicing shall be included for a period of 12 months untill the issue of the final completion certificate.

3.03 SPARE PARTS & TOOLS

The manufacturer shall be able to provide:
- A list of recommended spare parts
- All service tools
- Instructions of how to service and maintain the pumps and associated equipment specified
- Instructions of how to service and maintain the pumps and associated equipment specified

PME/2 : PROJECT AND GENERAL SPECIFICATIONS – PUMP PIPEWORK AND FITTINGS

Pipework, valves and associated fittings shall form part of a separate scope of work.

PART 4 GRINDER INSTALLATION

4.01 Specifications and General Requirements

In - channel grinders are required to be installed on the inlet pipework into each wet well or sump for each of the following pump stations :

- Hoof Sewer pump station 1
- Beta Metal Sewer pump station 2

A. Grinder for Hoof Sewer Pump Station 1 :

The in-channel flanged grinders for shredding of solids and foreign matter shall be type API Pumps JWC Muffin Monster Model 3005-0024 flanged with a flow through of up to 85-90l/s.
The grinders shall be suitable for solids in sludge / sewage applications.

JWC MUFFIN MONSTER MODEL 30005-0024 :

- Counter rotation dual shaft in-channel configuration (not in-line flanged)
- Individually stacked with 174130 alloy steel fitted with knurled spacers
- Spacers and cutters hardened and heat treated to 52 – 55
- Rockwell C Grinder supplied with integrated Delta P high flow side rails and optimum cut control speed fitted with 4kW 4 pole IE3 electric motor ; 3m extension shaft
- Stainless steel bracket
- JWC approved control approved

B. Grinder for Beta Metal Sewer Pump Station 2 :

The in-channel flanged grinders for shredding of solids and foreign matter shall be type Gorman Rupp-Franklin Model TM851206 flanged with a flow through of up to 38l/s.
The grinders shall be suitable for solids in sludge / sewage applications with the following specifications:

TASKMASTER® GRINDER, Model TM851206:

- In-channel type (not in-line flanged)
- Cutter Cartridge Technology: 7Tooth Cam Cutters, 4140 H.T.
- Nom. 8" x 12" Cutting Chamber
- 6" Ansi (DIN 150) Flange Housing- 150# Bolt Pattern
- Drop-In Design Housing For Easy Maintenance. D.I.
- Mechanical Seals: TC vs. TC 90 psi max.
- 2" Hexagonal Shafting, 4140 H.T.
- Painted 2 Coats Heavy Epoxy Coating - Osha Blue
- IE3 motor
- CP2 control panel

DRIVE INSTALLED SHALL INCLUDE THE FOLLOWING:

- Cycloidal Vertical Down, Grease Filled Reducer
- Coupling: High Torque Jaw Style
- For 2.2kW IEC 112 L B-5 Face Motor

C. GRINDERS – GENERAL :

The units shall comply to the following specifications and requirements & include the following :

- Supplied complete with mounting flanges for mounting to inlet pipelines
- Slow speed high torque
- Removable outer cartridge
- Have facilities to remove all debris and shredded items for loading and transport
- Ductile iron body
- S/steel frames
- Cutters - hardened alloy steel
- Mechanical tungsten carbon faces
- Flanges to ANSI , JIS, JWA, BS & AS
- Fan cooled motors outdoor type 400V 50Hz 2,2kW, 4kW or as required. (supplier to confirm this)
- IP65 control panel with auto-reverse and anti-jamming facilities
- Auto load sensing control and reverse cycles
- SS & Nema 7 enclosures

The grinder units will be installed in a chamber to protect it from the elements and from vandalism. The units will be installed in-channel type (not in-line flanged) with inlet pipelines into each wet or sump with the pipe sized at 200 to 300 diameter. A by- pass pipework system with valves will be installed if the units are not functioning or if they are taken out for servicing etc.

A cable to the control panel will be provided by the electrical contractor.

Full details, brochures and technical data of the grinder units shall be provided at tender stage for evaluation purposes.

The grinder supplier shall check and confirm that the units are selected correctly and that they are able to perform optimally and efficiently.

The grinder supplier shall also supply all civil and concrete detail requirements to the Engineer including all power and other requirements.

Full O & M manuals and all operating and maintenance instructions of the units shall be provided.

The units shall be tested and commissioned by the supplier and all test and commissioning data shall be provided. The grinder supplier must be on site for the testing and commissioning.

ANNEXURE – A

RETURNABLE SCHEDULE (COMPULSORY) – COMPLETE ONE FOR EACH PUMP TYPE or PUMP STATION AND SUBMIT / RETURN WITH TENDER. MAKE COPIES OF THIS SCHEDULE AND COMPLETE FOR EACH TYPE OF PUMP

Typical Pump Data Sheet - HOOF PUMP STATION No 1
- BETA META PUMP STATION No 2

Contractual Duty Point specified		
Number of pumps required	No	
Type of pump		
Manufacturer of Pump		
Country of Manufacture		
Make and Model of Pump		
SANS, BS , ISO or IEC Standards the pump is manufacture to		
Type of impeller (state whether open, single-port, two-port or shrouded)		
Number of impellers/ stages	No	
Size of solids which can pass through the pump in normal operation	mm	
Mass of fully assembled pump (and motor)	kg	
Maximum allowable operating speed of pump	RPM	
Speed of pump at the specified duty point above	RPM	
Diameter of impeller offered	mm	
Will the impeller offered enable the pump to meet a duty point ranging from: -------m^3/hr ×------- m to------ m^3/hr x ------- m	State YES or NO	
Factory test pressure applicable to pump with suction and delivery flanges blanked off	kPa	

Pump efficiency at Duty Point	%	
Head developed by pump at zero discharge	m head of water	
Closed valve head of pump	m	
Moment of inertia of rotation assembly	kgm²	
Power Absorbed		
Power absorbed by pump at specified Duty Point	kW	
Power absorbed by pump at a run point of 810 m³/hr	kW	
Power absorbed at best efficiency point:	kW	
Maximum power absorbed by pump at run out point of coupling	kW	
Voltage (…….V for all pumps)	Volts	
NPSH		
NPSH requirement at specified Duty Point	m head of water	
NPSH requirement at a run point of 810 m³/hr	m head of water	
NPSH requirement at a run out point	m head of water	
Diameter of Pump Components:		
Suction inlet waterway and flange size	mm	
Delivery outlet waterway and flange size	mm	
Shaft (state minimum and maximum diameter if applicable)	mm	
Full size impeller diameter	mm	
Impeller diameter offered for duty specified	mm	
Minimum size impeller	mm	
Type and Material of Pump Components:		
Outboard bearing		
Inboard bearing		
Impeller		
% Chrome in impeller		
Shaft		
Shaft sleeves		
Pump volute Casing		
Motor casing		
Diffusers		
Wear Ring		

Mechanical Seals:		
Manufacturer		
Type/model		
Seal materials		
Packed Glands:		
Type		
Packing materials		
PT100 pump casing temperature sensors - all pumps		
Other sensors supplied with pump as specified		

Coupling Data Sheet – pumps and motors

Type of coupling and fixing method		
Mass of coupling	kg	
Type of coupling guard		
Approximate mass of coupling guard	kg	
Type of coupling bushing (where applicable)		
Type of coupling pins (where applicable)		

B4 PME/ELECTRICAL AND INSTRUMENTATION - PROJECT SPECIFICATION

PS 9 ELECTRICAL, INSTRUMENTATION & GENERATOR PROJECT SPECIFICATION

PS 9.1 GENERAL INFORMATION

PS 9.1.1 STANDARDS AND REGULATIONS

PS 9.1.1.1 GENERAL

The Standard Specifications forming part of this tender document shall apply unless otherwise indicated in this section. The Project Specification shall take preference if any discrepancies exist or if there are any un-certainties. The drawings issued herewith are to be read in conjunction with the Specifications and Schedules contained herein, together with all ancillary equipment necessary for a correct and complete installation and for compliance with the codes and standards, referred to in the Specification.

The Tenderer shall at the time of tendering, draw the Employer's Representative's attention to any omission or discrepancy between the specifications and the drawings and request clarification of undefined responsibilities.

PS 9.1.1.2 REGULATIONS

All plant and equipment, installed and tested under this contract shall comply with the requirements of the regulations as described under the relevant clauses of this specification or the Standard Specification document included elsewhere in this enquiry as follows:

a) Electrical and ancillary installations:

- SANS 10142 - 1 & 2: "Codes of practice for the wiring of premises" as amended.
- SANS 10400: "The application of the National Building Regulations" as amended
- SANS 60439 - Parts 1 & 2 LV Switchgear and Control Assembly
- SANS 1765 and SANS 60947 – Low Voltage Switchgear and Control Gear Assemblies, Contactors and Motor Starters
- SANS 1973-1,3 - Low Voltage Distribution Boards and Control Gear Assemblies
- SANS 10199 - The Design and Installation of an Earth electrode as amended.
- SANS 10313 - The Protection of Structures against Lightning
- IEC62305 – Lightning Protection
- The Occupational Health and Safety Act (85 of 1993) as amended and contingent regulations.
- The regulations and standards of the DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY where applicable
- Applicable NRS and SANS codes for electrical equipment
- BS or IEC codes where South African codes are non-existent.
- Local or Municipal Electrical Department standards and regulations
- Government and local authorities' ordinances or other supply authority governing its use
- Any other applicable by-laws or local authority by-law and amendments
- Eskom standards and regulations where applicable
- The regulations and standards as described under the relevant sections in the Standard Specifications
- Any other applicable by-laws or local authority by-law and amendments

PS 9.1.1.3 QUALITY CONTROL PROCEDURES

QCP's and associated documentation for all equipment specified in accordance with Municipality Standards or industry standards shall be submitted to the Employer's Representative or Engineer for comment and approval. No equipment shall be procured without the necessary QCP approvals.

PS 9.2 SCOPE OF WORK

PS 9.2.1 ELECTRICAL, INSTRUMENTATION & ANCILLIARY WORK

The electrical, instrumentation and ancillary work installation comprises and includes the manufacture, supply, delivery, installation, testing, commissioning, guarantee and maintenance of the following: This electrical contract comprises the design, supply, manufacture, delivery, testing and commissioning and guarantee of the following:

1. Hoof Sewage Pump Station 1

Design, manufacture and install the new MCC 01 for Pump Station 1 with 2 new soft starters for the sewer pumps and grinder including associated switchgear, control equipment etc
Submission of the MCC drawings prior to any panel construction work commencing
New power cabling from the Municipal or Eskom transformer/meter to the pump station MCC 01. (previously vandalised)
New power cabling from the MCC and to the new pumps, grinder etc
Cabling from MCC to Guard House and Toilets/Ablutions
Cabling including sleeves, and cable support systems from the MCC to the pump motors, grinder and instrumentation equipment including low level float switches and level instruments for the sump and pump station
Instrumentation including no flow switches on the delivery pipework of each pump for no – flow protection
Sump low level floats with stainless steel chain and weights. (pump low level protection)
Telemetry systems including intruder alarm system
New DB for the Guard House and Toilets/Ablutions
New lighting for the pump room, Guard House, Toilets/Ablutions and site lighting
New small power and socket outlets for the pump station and guard house
New welding socket outlet for the pump room
Lightning protection and earthing installation for the pump room and guard house
Earthing of the complete electrical installation of the new pump station and guard house
Liaison with Eskom or other municipal supply authority for the electricity supply and facilitate connection of the new MCC to the electricity meter
Submit a preliminary schedule showing all tasks leading up to final commissioning within the stipulated timelines
Issuing of the Electrical Certificate of Compliance (COC)
Issue of the lighting protection test and commissioning certificates
Issue of the earth test certificate
Supply 4 hard copies and 4 soft copies of the O & M manuals consisting of datasheets of all equipment, drawings, programming (electronic and printed copies).

2. Beta Metal Sewage Pump Station 2

a) Design, manufacture and install the new MCC 02 for Pump Station 2 with 2 new soft starters for the sewer pumps and grinder including associated switchgear, control equipment etc
b) Submission of the MCC drawings prior to any panel construction work commencing
c) New power cabling from the Municipal or Eskom transformer/meter to the pump station MCC 01.
d) New power cabling from the MCC and to the new pumps, grinder etc
e) Cabling from MCC to Guard House and Toilets/Ablutions
f) Cabling including sleeves, and cable support systems from the MCC to the pump motors, grinder and instrumentation equipment including low level float switches and level instruments for the sump and pump station

g) Instrumentation including no flow switches on the delivery pipework of each pump for no – flow protection
h) Sump low level floats with stainless steel chain and weights. (pump low level protection)
i) Telemetry systems including intruder alarm system
j) New DB for the Guard House and Toilets/Ablutions
k) New lighting for the pump room, Guard House, Toilets/Ablutions and site lighting
l) New small power and socket outlets for the pump station and guard house
m) New welding socket outlet for the pump room
n) Lightning protection and earthing installation for the pump room and guard house
o) Earthing of the complete electrical installation of the new pump station and guard house
p) Liaison with Eskom or other municipal supply authority for the electricity supply and facilitate connection of the new MCC to the electricity meter
q) Submit a preliminary schedule showing all tasks leading up to final commissioning within the stipulated timelines
r) Issuing of the Electrical Certificate of Compliance (COC)
s) Issue of the lighting protection test and commissioning certificates
t) Issue of the earth test certificate

Supply 4 hard copies and 4 soft copies of the O & M manuals consisting of datasheets of all equipment, drawings, programming (electronic and printed copies).

PS 9.2.2 SITE & GENERAL

a) The supply and installation of new site lighting around all the new structures, buildings or pump stations
b) The supply and installation of main power cabling to the new MCCs and site wide cable systems
c) All external power cable and instrumentation cable sleeves and support systems
d) Cable manholes and associated work (manholes by civil contractor)

PS 9.2.3 INSTRUMENTATION

e) The supply and installation of new mag flow meter on the delivery rising main line from the Hoof sewer pump station no 1 and the Beta Metal sewer pump station no 2 both pumping independantly to the existing Volksrust Waste Water Treatment Plant.
f) Ultrasoninc level indicators in each of the pump station sumps for control of the pumps (start and stop)
g) Level cut out floats in the new sumps of the pump stations 1 - 2
h) No-flow swithes on the delivery pipework of each pump
i) All instrumentation cabling

PS 9.2.4 STAND-BY DIESEL GENERATORS

Stand-by generators will be not be provided for each of the pump stations but may be provided under a separate contract at a later stage.

PS 9.2.5 OVERVIEW OF PUMPING SYSTEM *

1. Hoof Pump Station 1

Two self priming pumps (1 duty and 1 standby) pumps will be installed in the existing container situated above the open channel sewer sump in the existing pump station. These pumps will be replaced with what was there previously which was vandalised. Two (2) new API Pumps – Cornell self priming pumps and belt driven motors are to be installed in the new pump station making it a duty and stand-by system. Each pump is rated at a duty of 78l/s at a dynamic head of 20,4m 1380 RPM with a solids handling of min 70mm spherical solids. The suction lift from the bottom of the sump will be approx. 4,5m-5,5 (TBC). The motors will be WEG or similar approved 30kW 400V 50Hz 4 pole 1380 RPM - IE4 IP66 motor driving the pump with a belt drive and suitable for soft-start operation.

The new pumps and grinder will be driven from a new MCC which will be installed in the existing pump room. The pumps will be driven by soft starters.
.
The pumps will be manually controlled and also be automatically controlled as described under the electrical MCC section. Of the two pumps to be installed, under the normal conditions one pump will be operating as the duty pump, with the second pump acting as a standby.
The grinder will be operated manually or automatically when flow through the inlet to the sump is present.

The new pumps and motors will be supplied by the mechanical pump contractor.

The motors are to be installed with ant-condensate heaters and thermistors. The MCC will be installed in the Pump Room as shown on the drawings. The MCC will supply power to the pumps and instrumentation built into pipework and in the suction sump.

The MCC will be fed from the Eskom or municipality power meter.

2. Beta Metal Pump Station 2

Two Gorman Rupp self priming pumps (1 duty and 1 standby) pumps will be installed on concrete bases in the new pump room. Two (2) new Gorman Rupp self priming pumps and belt driven motors are to be installed in the new pump station making it a duty and stand-by system. Each pump is rated at 1247 RPM 4 Pole with a duty of 30,4l/s at a dynamic head of 20,17m with a solids handling of min 70mm spherical solids. The suction lift from the bottom of the sump will be 4,5m – 5.0m (TBC). The motors will be WEG or similar approved 18,5kW 400V 50Hz 4 pole IE4/IE3 IP66 motor driving the pump with a belt drive and suitable for soft-start operation.

The new pumps and grinder will be driven from a new MCC which will be installed in the new pump room. The pumps will be driven by soft starters.
.
The pumps will be manually controlled and also be automatically controlled as described under the electrical MCC section. Of the two pumps to be installed, under the normal conditions one pump will be operating as the duty pump, with the second pump acting as a standby.
The grinder will be operated manually or automatically when flow through the inlet to the sump is present.

The new pumps and motors will be supplied by the mechanical pump contractor.

The motors are to be installed with ant-condensate heaters and thermistors. The MCC will be installed in the Pump Room as shown on the drawings. The MCC will supply power to the pumps and instrumentation built into pipework and in the suction sump.

The MCC will be fed from the Eskom or municipality power meter.

PS 9.2.6 EXCLUSIONS (ITEMS BY MAIN CIVIL CONTRACTOR OR BY OTHERS)

Parts of the installation to be undertaken by local authorities, civil contractor specialists or other sub-contractors or installation work that is not allowed for is defined below and covers the following general sections:

a) PLC & HMI
b) SCADA sustems
c) UPS
d) The telephone/data/IT/PA/CCTV/alarm/intercom/security and fire dection wiring, equipment and connections.
e) Geysers and hot water appliances or apparatus
f) Solar power systems
g) The intercom/security, fire detection wiring, equipment and connections.

h) The Eskom or Municipality incoming main supply covered by the supply authorities responsibilities to a defined consumer responsibility point.
i) Any item of a building or structural component including louvres , grilles etc
j) Builders work details , openings in brickwork , floors , slabs etc.
k) Manholes
l) Mechanical equipment, pumps, dosing equipment and motors etc (by mechanical contractor)

PS 9.3 DRAWINGS

The following civil and pump station drawings are issued and shall form part of the tender documents and should be read with the specifications at all times.

NB : Electrical and civil drawings are not available for the tender, but will be made available during the construction stages. The civil drawings may be made available during the tender period, but this is not guaranteed.
It is advisable that the tenderers visit the sites to acquaint themselves with site conditions, as no additional costs will be entertained due to lack of information or drawings.

The electrical and instrumentation drawings will be issued to the contractor during the constructions stages and may be in a hand sketch drawing format. Alternatively the Engineer will issue site instructions or directions on site of what the requirements are to be.

PS 9.4 POWER SUPPLY & ELECTRICAL SYSTEMS

PS 9.4.1 MAIN INCOMING POWER SUPPLY

The power provider is to be ascertained as either being Eskom or municipality supply.

The contractor shall be responsible to liase with Eskom or the Municipality for the up-graded or new supply and make all applications for the electrical connections. He shall be in attendance for all applications, negotiations and switch on of the supply to the site/s.

The transformer, meter and cabling to the existing Hoof pump station was vandalised or stolen and is to be re-instated. There was no previous supply for the Beta Metal pump station.

The costs of any electricity up-grades or new supply shall be paid for by the contractor and is included as provisional sums covered in the bill of quantities.
Stand-by generator power will be not provided for each pump station site and may be installed at a later date. The future generator will have its own gen-set change-over panel with the mains power terminating onto the panel directly from Eskom . This must be taken into account in the design of the MCC and electrical systems.

PS 9.4.2 RETICULATION ON SITE

The low voltage supply distribution and reticulation on site is to be a 230/400volts system. All new systems shall match this rating.

PS 9.5 CONTROL PANELS, MCC's & DISTRIBUTION BOARDS

PS 9.5.1 General

The MCC design shall be undertaken by personnel who are qualified and able to demonstrate experience in the field of water treatment and pumping plant including PLC control and telemetry systems.

The construction of the main and local control panels and distribution boards shall be in accordance with the following Codes and Standards:

- The latest issue of SANS 556: “Low-voltage switchgear Part 1: Circuit-breakers
- The latest issue of SANS 1765: “Low-voltage switchgear and control gear assemblies (distribution boards) with a rated short-circuit withstand strength up to and including 10 kA”
- The latest issue of SANS 60439 1-5: “Low-voltage switchgear and control gear” assemblies
- The latest issue of SANS 60947: 1-8: “Low-voltage switchgear and control gear”,
- The latest issue of SANS 1973: “Low-voltage switchgear and control gear Assemblies Part 1-8”

PS 9.5.2 Drawings and Data To Be Provided By Contractor

The contactor shall provide to the Client and the Employer’s Representative or Engineer comprehensive and detailed specifications, wiring and layout diagrams etc of the following for comments and approval:

- Wiring and layout diagrams of all motor control panels, local control panels, main panels, distributions boards etc
- Component and parts list of all motor control panels and distribution boards
- FDS (Functional Design Specifications) where applicable
- P & I D diagrams for the entire project where applicable
- Process flow diagrams where applicable
- PLC wiring diagrams where applicable
- PLC I/O lists where applicable
- PLC program where applicable
- Process control network diagrams where applicable
- Instrument loop block diagrams where applicable
- Instrument tag numbers
- Cable schedule and numbering (power and instrumentation)
- Cable block diagrams

The above requirements will only apply to what is specified for this project only.

The Client and the Employer’s Representative or Engineer will comment and confer approval once these satisfy the specifications and requirements. These drawings shall be revised when changes are required and be updated to as-built for inclusion in the operations and maintenance manuals.

PS 9.5 3 HOOF SEWER PUMP STATION 1 : MCC - 01

The MCC shall be wall mounted IP65 motor control panel constructed of 3CR12 material and is to be installed in the new pump room.

There are cubicles in this MCC which will be equipped with switchgear, soft starters and control gear to feed and control the new 30 kW sewage pumps and 4kW grinder. There will be three (3) internally mounted soft staters to supply and control the pump motors and grinder.

The MCC shall be equipped with all the necessary feeders or starters for the various motors and power systems for the various instruments. All critical panel components such as system trips, run, stop, off, etc. shall be linked to a future PLC system with facilities to link back to a future SCADA system. Facilities for interlocks, trips, alarms and trends shall be provided for logging onto a future SCADA for history data and monitoring. All equipment and control systems shall suit the requirements of the FDS and P & I D diagrams to be prepared and submitted by the electrical contractor/panel builder. Equipment shall be manually controlled locally in the MCC and automatically.

The MCC main switch shall be rated at 200 Amps three phase at a fault level of 10 kA. The panel shall be bottom cable entry only.

The motor control panel builder shall determine if the switchgear can fit in the spaces provided.

VSD's and soft starters shall have a removable, password locked keypad on door.

The MCC shall be equipment with a Schneider PM5000 or similar approved digital power meter and analyser.

The MCC shall be designed, installed and tested in accordance with industry standard specifications. The type of electrical equipment components shall be as per the Client's approval and standards or as per the equipment schedule attached.

All equipment where 2 or more off are provided shall be operated on a duty and stand-by basis or as specified. All trips shall have a re-set push button and must be wired into the control circuit.

Generally, the panel shall consist of and equipped with the following:

Panel 1: Incomer
This panel shall contain the following :

- One set of suitable sized three phase and neutral copper bus bars complete with support insulators in accordance with the Standard Specifications. One substantial copper earthing bar complete with sufficient number of studs or bolts, nuts, and washers for the incoming and outgoing earth conductors.
- One 200 Amp 400 Volts suitably rated triple pole CB switch lockable in the "off" position and shall be compliant with type 2 co-ordination. All live parts of the switch shall be shrouded to prevent inadvertent contact by maintenance personnel.
- 3 No. HRC Voltmeter fuses.
- 3 No. Current transformers.
- 1 No. Power meter Schneider PM5000 with facilities for phase / phase / neutral voltages and current on all 3 phases.
- 1 No. Set fuses with mains and phase failure relays incorporating phase loss, phase reversal, under voltage, over voltage and phase imbalance.
- 1 No. Power on indication light.
- 1 No. 4 Pole Surge arresters as specified in the Standard Specification.

Panel 2: Duty Soft Starter 30kW 400V Sewer Pump 1

1 No. Suitably rated TP fuse switch mechanically interlocked with the panel door. All live parts to be shrouded.
1 No. HRC fuse.
1 No. Control link.
1 No Suitably rated main contactor before the drive (with time delay off control)
1 No. 30kW Soft Starter (ABB, Schneider, WEG or Control Technologies range or similar) with suitable overload and anti – single phase protection with Ethernet Port to future PLC switch
1 No. Suitably rated CT and ammeter with 96 mm dial.
1 No Manual -Off - Auto switch with stop/start push buttons
1 Run hour meter
1 Start counter+
1 No 6A MCB (controls)
1x timer and no-flow trip circuit (no flow delay)
1 Set Motor run, motor stop, motor trip and circuit healthy indication lights (Green, Yellow, Red, White)
1 Set auxiliary relays/contacts for emergency stop lock circuitry
1 No Relays/contacts for low level circuitry
1 Vent fan and circuit to suit for soft starter (if required)
Set circuitry for motor heaters
Set circuitry for motor thermisters

1 Set Control equipment, relays, contacts, interlocks etc. for local manual and automatic controls (future PLC controls and interface)

This panel shall be labelled " Sewer Pump 1 "

Panel 3: Stand-By Soft Starter for 30kW 400V Sewer Pump 2

1 No. Suitably rated TP fuse switch mechanically interlocked with the panel door. All live parts to be shrouded.
1 No. HRC fuse.
1 No. Control link.
1 No Suitably rated main contactor before the drive (with time delay off control)
1 No. 30kW Soft Starter (ABB, Schneider, WEG or Control Technologies range or similar) with suitable overload and anti – single phase protection with Ethernet Port to future PLC switch
1 No. Suitably rated CT and ammeter with 96 mm dial.
1 No Manual -Off - Auto switch with stop/start push buttons
1 Run hour meter
1 Start counter+
1 No 6A MCB (controls)
1x timer and no-flow trip circuit (no flow delay)
1 Set Motor run, motor stop, motor trip and circuit healthy indication lights (Green, Yellow, Red, White)
1 Set auxiliary relays/contacts for emergency stop lock circuitry
1 No Relays/contacts for low level circuitry
1 Vent fan and circuit to suit for soft starter (if required)
Set circuitry for motor heaters
Set circuitry for motor thermisters
1 Set Control equipment, relays, contacts, interlocks etc. for local manual and automatic controls (future PLC controls and interface)

This panel shall be labelled " Sewer Pump 2 "

Panel 4: Duty Soft Starter for 4,0kW 400V Grinder 1

1 No. Suitably rated TP fuse switch mechanically interlocked with the panel door. All live parts to be shrouded.
1 No. HRC fuse.
1 No. Control link.
1 No Suitably rated main contactor before the drive (with time delay off control)
1 No. 4,0kW Soft Starter (ABB, Schneider, WEG or Control Technologies range or similar) with suitable overload and anti – single phase protection with Ethernet Port to future PLC switch
1 No. Suitably rated CT and ammeter with 96 mm dial.
1 No Manual -Off - Auto switch with stop/start push buttons
1 Run hour meter
1 Start counter+
1 No 6A MCB (controls)
1x timer and no-flow trip circuit (no flow delay)
1 Set Motor run, motor stop, motor trip and circuit healthy indication lights (Green, Yellow, Red, White)
1 Set auxiliary relays/contacts for emergency stop lock circuitry
1 No Relays/contacts for low level circuitry
1 Vent fan and circuit to suit for soft starter (if required)
Set circuitry for motor heaters
Set circuitry for motor thermisters
1 Set Control equipment, relays, contacts, interlocks etc. for local manual and automatic controls (future PLC controls and interface

This panel shall be labelled " Grinder 1 "

Panel 5 – Domestic Distribution :

The panel shall be equipped as follows:

- 1 No. 60Amp Main Switch or Isloator and busbars or droppers
- 1 x 60Amp/30ma earth leakage relay for plug circuit
- 2 x 20Amp SP CB 9 plugs)
- 3 x 15Amp SP CB (lights)
- 1 x 5Amp SP CB (telemetry panel)
- 1 x 5Amp SP CB (photo cell)
- 1 x 5Amp SP CB (by-pass)
- 1 x 40 Amp TP CB with EL protection (welding plug)
- 1 x 20 Amp TP CB with 1 x 10Amp TP contactor with overload , start/stop push buttons and start/stop indication lights for extract fan circuits
- 2 x 10 Amp SP CB (spares)

Panel 6 - Pump Controls :

The panel shall be equipped as follows:

- 1 No. Control circuit HRC fuse
- 1 No. Neutral link
- 2 No 5Amp CB
- Suitable terminals , bases etc as required
- Sutable contacts, timers and relays etc as required (pump and grinder protection and interlocks)
- Suitable surge arrestors for all 12/24Volt field instruments
- 24V DC power supply for instruments (level sensor etc)
- Level transmitter
- Set Surge arresters on main power supply

Controls :

Automatic and Manual Mode

The sewer pump/s shall operate automatically via the ultrasonic level sensor in the suction wet sump. The pumps must operate on duty- standby philosophy. Only one pump must start at a time and there must be an interlocking in the control systems to prevent the other pump from starting while the one is running. The interlock must only inhibit the pump when a start attempt is made. The duty pump/s must be automatically rotated.

The final control philosophy shall be developed by the control panel builder in conjunction with the Engineer and this shall be catered for in the pricing.

In Manual Mode, the pumps shall operate when they are locally selected to do so, using the Auto/Manual/Off selector switch and the push buttons on the panel door. All pump protection shall be active under the manual and auto mode.

Each pump must have, “Overload Trip” and “Under-Current Protection “. All pump trip signals must de-energize a “Pump Inhibit” relay which will trip the pump.

The pumps shall draw raw sewage from the on-site suction sump (wet well) . A no-flow switch shall be installed on the delivery side of each pump to trip the pump should a no flow condition arise. This is to protect the pump from dry running. Low level floats shall be installed in the suction sump to cut out the pump/s should the sump levels be low. These levels shall be determined on site later. Hard-wired trip signals including the inhibit, low level cut-out, etc shall be wired into the pump control circuit (unless agreed with Engineer during review of the electrical drawings).

When the pump inhibit relay/s are activated, the inhibit indication lamp on the pump panel must also be

activated and the stand-by pump started, if available. Pumps must automatically start up after a trip has been reset/cleared. Should any pump fail to start, after a period of 10 seconds, the next available pump should be requested to do so.

The duty pump/s must automatically start up after power is restored in the event of a power failure. All pumps must be limited to a maximum of ten starts per hour. All other protection and other features, as mentioned in the contract document and standard specifications must be incorporated as required.

Telemetry

Telemetry control will not be required under this phase of the project but could be incorporated at a later stage.

A GSM telemetry system will be provided for the status monitoring of the pump station. Full integration between the MCC and telemetry system is to be provided and included.

A “future Telemetry Control” feature must be incorporated into the design which will provide remote control.

The pumps shall be automatically controlled by levels (ultrasonic level sensor) for starting and stopping of the pumps. The final levels shall be set during the commissioning stages of the pump station.

Marshalling:

Signals shall include but are not limited to what is required below. The electrical panel builder and Engineer shall determine the final requirements.

The following minimum signals shall be provided as specified in the project and standard specifications:

Pump Signals: (per pump)

Auto / manual
Pumps run/stop
Pumps trip
Pumps run hours
No flow
Thermistor trip
Pressure (optional if installed)

Mains: Power On or Off

Generator : Running
Stop / tripped
Fuel level
Low fuel alarm

Instrumentation Signals:

Pumps no flow trip
Sump low level trip
Sump high level
Sump high-high level

Flow

Intruder alarm

24V DC fuse fail

Other signals as determined with the Engineer and the contractor

Panel 7 - Spare

PS 9.5.4 BETA METAL SEWER PUMP STATION 2 : MCC - 02

The MCC shall be wall mounted IP65 motor control panel constructed of 3CR12 material and is to be installed in the new pump room.

There are cubicles in this MCC which will be equipped with switchgear, soft starters and control gear to feed and control the new 18,5 kW sewage pumps and 2,2kW grinder. There will be three (3) internally mounted soft staters to supply and control the pump motors and grinder.

The MCC shall be equipped with all the necessary feeders or starters for the various motors and power systems for the various instruments. All critical panel components such as system trips, run, stop, off, etc. shall be linked to a future PLC system with facilities to link back to a future SCADA system. Facilities for interlocks, trips, alarms and trends shall be provided for logging onto a future SCADA for history data and monitoring. All equipment and control systems shall suit the requirements of the FDS and P & I D diagrams to be prepared and submitted by the electrical contractor/panel builder. Equipment shall be manually controlled locally in the MCC and automatically.

The MCC main switch shall be rated at 150 Amps three phase at a fault level of 10 kA. The panel shall be bottom cable entry only.

The motor control panel builder shall determine if the switchgear can fit in the spaces provided.

VSD’s and soft starters shall have a removable, password locked keypad on door.

The MCC shall be equipment with a Schneider PM5000 or similar approved digital power meter and analyser.

The MCC shall be designed, installed and tested in accordance with industry standard specifications. The type of electrical equipment components shall be as per the Client’s approval and standards or as per the equipment schedule attached.

All equipment where 2 or more off are provided shall be operated on duty and stand-by basis or as specified. All trips shall have a re-set push button and must be wired into the control circuit.

Generally, the panel shall consist of and equipped with the following:

Panel 1: Incomer
This panel shall contain the following :

- One set of suitable sized three phase and neutral copper bus bars complete with support insulators in accordance with the Standard Specifications. One substantial copper earthing bar complete with sufficient number of studs or bolts, nuts, and washers for the incoming and outgoing earth conductors.
- One 150 Amp 400 Volts suitably rated triple pole CB switch lockable in the "off" position and shall be compliant with type 2 co-ordination. All live parts of the switch shall be shrouded to prevent inadvertent contact by maintenance personnel.
- 3 No. HRC Voltmeter fuses.
- 3 No. Current transformers.

- 1 No. Power meter Schneider PM5000 with facilities for phase / phase / neutral voltages and current on all 3 phases.
- 1 No. Set fuses with mains and phase failure relays incorporating phase loss, phase reversal, under voltage, over voltage and phase imbalance.
- 1 No. Power on indication light.
- 1 No. 4 Pole Surge arresters as specified in the Standard Specification.

Panel 2: Duty Soft Starter 18,5kW 400V Sewer Pump 1

1 No. Suitably rated TP fuse switch mechanically interlocked with the panel door. All live parts to be shrouded.
1 No. HRC fuse.
1 No. Control link.
1 No Suitably rated main contactor before the drive (with time delay off control)
1 No. 18,5kW Soft Starter (ABB, Schneider, WEG or Control Technologies range or similar) with suitable overload and anti – single phase protection with Ethernet Port to future PLC switch
1 No. Suitably rated CT and ammeter with 96 mm dial.
1 No Manual -Off - Auto switch with stop/start push buttons
1 Run hour meter
1 Start counter+
1 No 6A MCB (controls)
1x timer and no-flow trip circuit (no flow delay)
1 Set Motor run, motor stop, motor trip and circuit healthy indication lights (Green, Yellow, Red, White)
1 Set auxiliary relays/contacts for emergency stop lock circuitry
1 No Relays/contacts for low level circuitry
1 Vent fan and circuit to suit for soft starter (if required)
Set circuitry for motor heaters
Set circuitry for motor thermisters
1 Set Control equipment, relays, contacts, interlocks etc. for local manual and automatic controls (future PLC controls and interface)

This panel shall be labelled “ Sewer Pump 1 “

Panel 3: Stand-By Soft Starter for 18,5kW 400V Sewer Pump 2

1 No. Suitably rated TP fuse switch mechanically interlocked with the panel door. All live parts to be shrouded.
1 No. HRC fuse.
1 No. Control link.
1 No Suitably rated main contactor before the drive (with time delay off control)
1 No. 18,5kW Soft Starter (ABB, Schneider, WEG or Control Technologies range or similar) with suitable overload and anti – single phase protection with Ethernet Port to future PLC switch
1 No. Suitably rated CT and ammeter with 96 mm dial.
1 No Manual -Off - Auto switch with stop/start push buttons
1 Run hour meter
1 Start counter+
1 No 6A MCB (controls)
1x timer and no-flow trip circuit (no flow delay)
1 Set Motor run, motor stop, motor trip and circuit healthy indication lights (Green, Yellow, Red, White)
1 Set auxiliary relays/contacts for emergency stop lock circuitry
1 No Relays/contacts for low level circuitry
1 Vent fan and circuit to suit for soft starter (if required)
Set circuitry for motor heaters
Set circuitry for motor thermisters
1 Set Control equipment, relays, contacts, interlocks etc. for local manual and automatic controls (future PLC controls and interface)

This panel shall be labelled " Sewer Pump 2 "

Panel 4: Duty Soft Starter for 2,2 kW 400V Grinder 1

1 No. Suitably rated TP fuse switch mechanically interlocked with the panel door. All live parts to be shrouded.
1 No. HRC fuse.
1 No. Control link.
1 No Suitably rated main contactor before the drive (with time delay off control)
1 No. 2,2W Soft Starter (ABB, Schneider, WEG or Control Technologies range or similar) with suitable overload and anti – single phase protection with Ethernet Port to future PLC switch
1 No. Suitably rated CT and ammeter with 96 mm dial.
1 No Manual -Off - Auto switch with stop/start push buttons
1 Run hour meter
1 Start counter+
1 No 6A MCB (controls)
1x timer and no-flow trip circuit (no flow delay)
1 Set Motor run, motor stop, motor trip and circuit healthy indication lights (Green, Yellow, Red, White)
1 Set auxiliary relays/contacts for emergency stop lock circuitry
1 No Relays/contacts for low level circuitry
1 Vent fan and circuit to suit for soft starter (if required)
Set circuitry for motor heaters
Set circuitry for motor thermisters
1 Set Control equipment, relays, contacts, interlocks etc. for local manual and automatic controls (future PLC controls and interface

This panel shall be labelled " Grinder 1 "

Panel 5 – Domestic Distribution :

The panel shall be equipped as follows:
- 1 No. 60Amp Main Switch or Isloator and busbars or droppers
- 1 x 60Amp/30ma earth leakage relay for plug circuit
- 2 x 20Amp SP CB 9 plugs)
- 3 x 15Amp SP CB (lights)
- 1 x 5Amp SP CB (telemetry panel)
- 1 x 5Amp SP CB (photo cell)
- 1 x 5Amp SP CB (by-pass)
- 1 x 40 Amp TP CB with EL protection (welding plug)
- 1 x 20 Amp TP CB with 1 x 10Amp TP contactor with overload , start/stop push buttons and start/stop indication lights for extract fan circuits
- 2 x 10 Amp SP CB (spares)

Panel 6 - Pump Controls :

The panel shall be equipped as follows:
- 1 No. Control circuit HRC fuse
- 1 No. Neutral link
- 2 No 5Amp CB
- Suitable terminals , bases etc as required
- Sutable contacts, timers and relays etc as required (pump and grinder protection and interlocks)
- Suitable surge arrestors for all 12/24Volt field instruments
- Level transmitter
- 24V DC power supply for instruments (level sensor etc)
- Set Surge arresters on main power supply

Controls :

Automatic and Manual Mode

The sewer pump/s shall operate automatically via the ultrasonic level sensor in the suction wet sump. The pumps must operate on duty- standby philosophy. Only one pump must start at a time and there must be an interlocking in the control systems to prevent the other pump from starting while the one is running. The interlock must only inhibit the pump when a start attempt is made. The duty pump/s must be automatically rotated.

The final control philosophy shall be developed by the control panel builder in conjunction with the Engineer and this shall be catered for in the pricing.

In Manual Mode, the pumps shall operate when they are locally selected to do so, using the Auto/Manual/Off selector switch and the push buttons on the panel door. All pump protection shall be active under the manual and auto mode.

Each pump must have, “Overload Trip” and “Under-Current Protection “. All pump trip signals must de-energize a “Pump Inhibit” relay which will trip the pump.

The pumps shall draw raw sewage from the on-site suction sump (wet well) . A no-flow switch shall be installed on the delivery side of each pump to trip the pump should a no flow condition arise. This is to protect the pump from dry running. Low level floats shall be installed in the suction sump to cut out the pump/s should the sump levels be low. These levels shall be determined on site later. Hard-wired trip signals including the inhibit, low level cut-out, etc shall be wired into the pump control circuit (unless agreed with Engineer during review of the electrical drawings).

When the pump inhibit relay/s are activated, the inhibit indication lamp on the pump panel must also be activated and the stand-by pump started, if available. Pumps must automatically start up after a trip has been reset/cleared. Should any pump fail to start, after a period of 10 seconds, the next available pump should be requested to do so.

The duty pump/s must automatically start up after power is restored in the event of a power failure. All pumps must be limited to a maximum of ten starts per hour. All other protection and other features, as mentioned in the contract document and standard specifications must be incorporated as required.

Telemetry

Telemetry control will not be required under this phase of the project but could be incorporated at a later stage.

A “future Telemetry Control” feature must be incorporated into the design which will provide remote control.

A GSM telemetry system will be provided for the status monitoring of the pump station. Full integration between the MCC and telemetry system is to be provided and included.

The pumps shall be automatically controlled by levels (ultrasonic level sensor) for starting and stopping of the pumps. The final levels shall be set during the commissioning stages of the pump station.

Marshalling:

Signals shall include but are not limited to what is required below. The electrical panel builder and Engineer shall determine the final requirements.

The following minimum signals shall be provided as specified in the project and standard specifications:

Pump Signals: (per pump)

Auto / manual

Pumps run/stop

Pumps trip

Pumps run hours

No flow

Thermistor trip

Pressure (optional if installed)

Mains: Power On or Off

Generator : Running

Stop / tripped

Fuel level

Low fuel alarm

Instrumentation Signals:

Pumps no flow trip

Sump low level trip

Sump high level

Sump high-high level

Flow

24V DC fuse fail

Other signals as determined with the Engineer and the contractor

Panel 7 - Spare

PS 9.5.6 DOL STARTER CONTACTORS

DOL starter contactors shall comply to IEC/SANS60947-4-1,2 & 3 and be fitted with a suitable contactor/s incorporating motor protection, overload, undercurrent and anti-single phase protection. The contactor shall have a bimetal or electromagnetic overload relay with in-built single phasing protection suitable for motor protection.
The contactors shall be appropriately rated for the anticipated full load of the motor to suit the mechanical loads.
The contactor shall have facilities for twin push buttons for on and off switching. The contactor shall be protected by fuses or current limiting circuit breakers to protect the equipment against abnormally high inrush currents or short circuit in the electrical system.
The contactor shall have two NO and two NC coils rated at 230/415V with auxiliary contacts for control circuitry and two spares all rated at 10 ampere.
All contactors and relays shall be able to withstand the maximum prospective fault current that can occur at the point where the contactor or relay is installed and as specified in the detailed specification. All contactors and relays shall be clearly labelled.

Full details and brochures of all the contactors to be used or proposed shall be provided by the contractor for comments and approval by the Engineer.

PS 9.5.7 SOFT STARTERS

Conformity of standards
EC Standard :
The soft starter shall be constructed and tested in accordance with the international IEC standards EN 60947-1 and EN 60947-4-2 and respect the following EC directives:

- "Low voltage Equipment" No. 2006/95/EC
- "Electromagnetic compatibility Directive" (EMC) No.2004/108/EC

UL Standard :
The soft starter shall be constructed and tested in accordance with UL 508.
Product features
The soft starter shall comply with the following technical requirements:

General specification

- Three phase control with operation voltage: 208 - 600VAC or 208 - 690VAC, 50/60 Hz
- Wide rated control supply voltage: 100 - 250VAC 50/60 Hz
- Built-in bypass to reduce energy consumption at full speed and increase the life time of soft starter.
- Possibility for both in-line and inside-delta connection of the motor
- The soft starter shall have built-in Modbus RTU for communication. Support for other protocols shall be an option.
- The soft starter shall be equipped with one analog output.
- The soft starter shall have a minimum of 3 signal Relays Output for Run, Bypass (Top of Ramp) and Event signal.

User interface

- The soft starter shall support multiple languages in both the manual and HMI, including: English, Swedish, German, French, Italian, Spanish, Portuguese, Dutch, Polish, Russian, Finish, Turkish, Czech, Chinese and Arabic.
- The soft starter shall have a detachable keypad with graphical LCD display. The keypad shall have start and stop buttons, information button for access to a built-in manual and an USB-port for connection to a PC.

Environmental conditions

- The soft starter shall have coated PCBAs to withstand harsh environments.
- The soft starter shall support operational temperature of -25 to +60℃ with de-rating of maximum 0.8% per ℃ above 40℃
- The soft starter shall be able to operate on up to 4000 meters above sea level with de-rating of maximum 0.67% per meter above 1000 meters

Motor starting, stopping and operation

- The soft starter shall have pre-start functions:
  - Stand still brake, to keep the load still before start
  - Motor heating, to keep the motor well-tempered before start
- The soft starter shall have the following start ramps available:
  - Voltage start ramp
  - Torque start ramp
  - Full voltage start
- The soft starter shall have possibility for slow speed forward and backward operation for positioning of a motor load.
- The soft starter shall have Torque Control and pump cleaning feature, to eliminate water hammering and prolong lifetime of the pump system.
- The soft starter shall include a kick start feature to be able to start heavy loads.
- The soft starter shall have the following three types of current Limit:
  - Current Limit
  - Dual Current Limit
  - Current Ramp
- The soft starter shall have a limp mode feature to allow the soft starter to operate even with shorted thyristors in one phase.
- The soft starter shall have possibility for sequence start of up to 3 different motors.

Built-in motor protections

The soft starter shall integrate motor and load protections, which shall under no circumstances be disabled when the integrated bypass is used. The soft starter shall also be able to present a warning before tripping for each protection.

The soft starter shall have the following motor protections available

- Electronic Overload Protection, class 10A, 10, 20, 30
- Locked Rotor Protection
- Motor Underload Protection
- Current Imbalance Protection
- Voltage Imbalance Protection
- Overvoltage and Under Voltage Protection
- Phase Reversal Protection
- Earth-fault Protection

It shall also have input for PTC and PT100.

Built-in diagnostics

The soft starter shall have the following diagnostics features: • THD(U)-Total Harmonic Distortion

- Counted number of start sequences
- Motor runtime measurement
- Thyristor runtime measurement
- Auto phase sequence detection
- Electricity metering
- Voltage sags detection
- Time to trip estimation
- Time to cool estimation

Fault detection

The soft starter shall provide following fault detection, to protect both the starting equipment, the load and the soft starter itself

- Phase loss
- High current
- Low control supply voltage
- Fault connection
- Bad network quality
- Thyristor overload

PS 9.5.7.1 COMMUNICATION

The unit shall have an open communications system, connected directly via Ethernet , RS485 or similar plug-in connectors, via a Modbus Plus network.

PS 9.5.7.2 PREFERRED SUPPLIERS

Soft Starters and VSDs shall be by WEG, Schneider, ABB or Feedback Electronics or similar and equal approved.

PS 9.6 DISTRIBUTION BOARDS & FAN CONTROL PANELS AND OTHER CONTROL PANELS

PS 9.6.1 DISTRIBUTION BOARDS

The following distribution boards as described shall be equipped and installed in positions shown on the drawings or as directed by the Engineer. The distribution boards required are shown on the following drawings or as specified below:

a) DB01 – Sewer Pump Stations

Type: Surface 3CR12 with lockable door painted electric orange epoxy coated.

The DB shall be equipped as follows :

1 x 60Amp TP Main Switch and busbars
1 x 60Amp/30ma earth leakage relay for plug circuit
4 x 20Amp SP CB (plugs)
6 x 15Amp SP CB (lights)
1 x 5Amp SP CB (telemetry panel)
1 x 5Amp SP CB (photo cell)
1 x 5Amp SP CB (by-pass)
1 x 40 Amp TP CB with EL protection (welding plug)
3 x 20 Amp TP CB with 3 x 10Amp TP contactor with overload , start/stop push buttons and start/stop indication lights for extract fan circuits
4 x 20 Amp SP CB (spares)

b) DB02 – Guard House
Type: Surface 3CR12 with lockable door painted white epoxy coated

1 x 60Amp DP Main Switch and busbars
1 x 60Amp/30ma earth leakage relay for plug circuit
1 x 20Amp SP CB (plugs)
2 x 15Amp SP CB (lights)
1 x 5Amp SP CB (photo cell)
1 x 5Amp SP CB (by-pass)
2 x 20 Amp SP CB (spares)

The DBs shall be surface manufactured from 1,6mm 3CR12 sheeting with lockable door and epoxy powder coated and painted electric orange. The DBs shall be manufactured and supplied by **Pitt Switchboards** or similar and equal approved. Approval must be obtained before the tender closes.

PS 9.7 CABLE RETICULATION SYSTEM

PS 9.7.1 GENERAL

The electrical contractor shall supply, deliver to site, lay in sleeves, ducts, manholes, lay in cable trenches excavated by himself, backfill the cable trench, connect up, test and commission the power and control cables.
A general description of the cables to be installed is tabled in the Cable Schedule elsewhere in this specification or as quantified.
Cable lengths shown on the schedule are approximate only. Actual lengths shall be physically measured on site before ordering of cables. Joints in cabling will not be permitted. Cables physically installed shall be claimed for payment. This applies to all other equipment.
Cable glands shall be CCG corrosion proof (Corrogland/Corruguard) or similar approved.
Plastic cable marker tape shall be placed 150 mm above cables during backfilling. Standard concrete cable markers shall be installed as indicated on the drawings all to SABS Specifications.

All power cabling shall be PVC/SWA/ECC/PVC, with copper conductors to SANS 1507. In instances cables shall embody an extra earth core as specified. Cables shall be buried at a depth of min 500mm. Power cable glands and shrouds shall comply with SANS 1213 type CCG or similar approved. Cables shall be full length point to point, no joints will be permitted.

All instrumentation cabling shall be multi strand copper braided cable or multi strand twisted pair cable Installed in a sleeve or fixed to cable tray.

Instrumentation cable glands and shrouds shall be type CCG, Pratley or similar approved brass compression or as approved by the Client or Engineer. Each cable end shall be labelled with a Bowthorpe Hellerman or similar type PK tag showing the cable details as indicated in the standard specification.

Cable tray and ladders shall be of the StrutAhead or similar approved pre-galvanised epoxy painted,

medium duty tray supported on the wall by galvanised P2000 at intervals not exceeding one meter on the vertical or 750 mm on the horizontal, or P2000 cantilever arm if secured to the floor.
All trenches for low voltage and control cables are to be 600mm deep and 400mm wide.

Cable marking tape 150mm wide is to be installed at a depth of 300mm below ground line. All trenches must be inspected before they are backfilled. The trench must be back filled and compacted with a plate compactor in layers not exceeding150mm. Ducts must be installed complete with 1.6mm galvanised draw wire. Two ducts may be laid in the same trench at a minimum distance of 150mm apart. All bends must be the long radius type. No more than 500 metres of excavation may be left open at a time. Excavations may not be left open especially over the December / January builders shut down period.

Cable markers shall be LG Green or similar and are to be installed at distances not exceeding 10 meters and at every change of direction. Markers are to consist of a concrete block 100mm c 100mm x 300mm and installed in the vertical position. An aluminium plate 75 x 75mm is to be embedded in the concrete or secured to the top of the block by means of two ram set screws 25mm long. The plate is to be punched with numbers and arrows on smaller than 10mm.

Installed cabling shall be made vandal proof which includes encasing the cables in concrete by the civil contractor where specified.

PS 9.7.1.2 CABING TO MCCs, DBs AND EQUIPMENT

All pumps etc and other equipment shall be fed from the Motor Control Centre Panel MCC01 located in the MCC Room situated on top of the reservoir.

Cables will be located on cable ladders or trays for the pumps and instrumentation. Local isolators and stop buttons will be provided for local and emergency power isolation. All powered instruments and powered equipment, such as the level sensors, actuators, solenoid valves, vibrators, load cells, etc. will be supplied from the local distribution board located as part of the MCC panel.

Wires to lights, plugs, fans, aircon units etc. shall be wired in conduit. All electrical cables shall be PVC SWA PVC with integral ECC in accordance with SANS 1507 & SANS 10142. No separate earth conductor will be provided. Main power feeder cables shall be buried in the ground or in uPVC sleeves.

Surface cables and instrument cables shall be routed within buildings or structures.
Cable trays shall be hot dipped galvanised and adequately sized to suit the number of cables they carry. Cables shall be suitably rated and sized for their anticipated loads and volt drop.

Refer to cable schedule and the drawings (where provided) for the new site electrical distribution system and cable reticulation. For other power cable requirements refer to the cable schedule in clause PS 9.6.1.3 below. The Engineer will direct the cable positions and routes where no drawing is available.

PS 9.7.1.3 INSTRUMENT CABLES

Instrumentation cables shall be 1,0mm² and 0,5mm² flexible stranded twisted copper wire for normal instrument signals and 1,5mm² or as scheduled in the cable schedules. All ethernet cables shall be CAT 6E industrial grade.

All terminations of cables will be terminated using appropriate termination glands with particular attention in any chemical dosing rooms where all equipment, cable terminations and connections being suitable for this EXE hazardous location.

PS 9.7.1.4 CABLE SCHEDULE

A cable schedule is tabulated below showing proposed cabling requirements between the MCC, PLC and related equipment. The following is a summary of cables required, but this shall not take away the

responsibility from the contractor to provide and ensure all cables and wiring for a complete working and operational system.
Note that all cables are re-measurable and cables lengths shall be physically measured on site before ordering. The bill must not be used for ordering as actual cable lengths installed shall be claimed for payment.

The contractor shall be responsible to provide the correct size and rated cabling for each application to be measured on site. Cables shall be full length and jointed cables will not be permitted unless they are over a drum length. All lengths are re-measurable and payment will be made for actual lengths installed.

Note each operating / safety device is to be supplied with a separate cable to a IP65 CCG box or weatherproof isolator at the device. Multi-core cables run to two or more devices will not be acceptable.

a) All cables are to be numbered according to the standard specification.
b) Wiring colour codes must be adhered to in accordance with the standard specification.
c) All light and plug circuits are to be labelled in accordance with the standard specification.

The following minimum cables are required and as itemised in the schedule of quantities. The final cables selected shall suit the final motor sizes and capacities chosen for their appropriate loads or pumps.

CABLE SCHEDULE :

Cable Ref	Cable Destination		Cable Type Size and No.	Installation Method	Length (m)
	From	To			
PS 9.1.1.1 HOOF SEWER PUMP STATION					
E01	Transformer/ meter	MCC 01 Hoof Sewer Pump Station 1	35 mm² x 4 Core ECC	Sleeves & ground	50m
E02	MCC 01	Sewer Pump 1	16 mm² x 3 Core ECC	On cable tray/ducts	10
E03	MCC 01	Sewer Pump 2	16 mm² x 3 Core ECC	On cable tray/ducts	10
E04	MCC 01	Grinder 1	10 mm² x 3 Core ECC	On cable tray/ducts	20
E05 a-c	MCC 01	Sewer Pumps 1 & 2 & Grinder motor thermisters	1,5mm² x 3C ECC	On cable tray/ducts	10 x 3
E06 a-c	MCC 01	Sewer Pumps 1 - 2 & Grinder stop locks	1,5mm² x 3C ECC	On cable tray/ducts	10 x 3
E07 a-b	MCC 01	Sewer Pumps 1 & 2 no-flow switches	1.5mm² x 3C ECC	On cable tray/ducts	10 x 2
E08	MCC 01	Suction sump low level floats	1.5mm² x 4C ECC	On cable tray/ducts	10
E09	MCC 01	Suction sump ultrasonic level transmitter	1.5mm² x 4C ECC	On cable tray/ducts	10

Cable Ref	Cable Destination		Cable Type Size and No.	Installation Method	Length (m)
	From	To			
E10 a-c	MCC 01	Sewer Pumps 1 & 2 & Grinder motor heaters	1.5mm² x 4C ECC	On cable tray/ducts	10 x 3
E11	MCC 01	Telemetry panel (future)	1.5mm² x 3C ECC	On cable tray/ducts	10
E12	MCC 01	Welding socket outlet	10mm² x 4C ECC	On cable tray/ducts	10
E13	MCC 01	DB-01	10mm² x 2C ECC	On cable trays/ducts	10
PS 9.1.1.2	**BETA META L SEWER PUMP STATION**				
E14	Transformer/ meter	MCC 02 Meta Beta Sewer Pump Station 2	25 mm² x 4 Core ECC	Sleeves & ground	50m
E15	MCC 02	Sewer Pump 1	16 mm² x 3 Core ECC	On cable tray/ducts	10
E16	MCC 02	Sewer Pump 2	16 mm² x 3 Core ECC	On cable tray/ducts	10
E17	MCC 02	Grinder 1	10 mm² x 3 Core ECC	On cable tray/ducts	20
E18 a-c	MCC 02	Sewer Pumps 1 & 2 & Grinder motor thermisters	1,5mm² x 3C ECC	On cable tray/ducts	10 x 3
E19 a-c	MCC 02	Sewer Pumps 1 - 2 & Grinder stop locks	1,5mm² x 3C ECC	On cable tray/ducts	10 x 3
E20 a-b	MCC 02	Sewer Pumps 1 & 2 no-flow switches	1.5mm² x 3C ECC	On cable tray/ducts	10 x 2
E21	MCC 02	Suction sump low level floats	1.5mm² x 4C ECC	On cable tray/ducts	10
E22	MCC 02	Suction sump ultrasonic level transmitter	1.5mm² x 4C ECC	On cable tray/ducts	10
E23 a-c	MCC 02	Sewer Pumps 1 & 2 & Grinder motor heaters	1.5mm² x 4C ECC	On cable tray/ducts	10 x 3
E24	MCC 02	Telemetry panel (future)	1.5mm² x 3C ECC	On cable tray/ducts	10
E25	MCC 02	Welding socket outlet	10mm² x 4C ECC	On cable tray/ducts	10

Cable Ref	Cable Destination		Cable Type Size and No.	Installation Method	Length (m)
	From	To			
E26	MCC 02	DB-01	10mm² x 4C ECC	On cable trays/ducts	10
PS 9.1.1.	**OTHER FEEDS**				
E40	MCC01 & 02	Guard House DB (all pump stations)	10mm² x 2C ECC	In ground and sleeves	30 x 3
E41	MCC01 & 02	All Grinders (all pump stations)	10mm² 4C ECC	In ground and sleeves	20 x 3

NB. The cable numbering above is indicative and for tender purpose only. The contractor shall determine and provide the final cable schedule and numbering to suit. Although all the cables required may not be in the above schedule, there is sufficient cables measured in the bill of quantities to cover all the cable requirements.

The contractor shall determine the cable lengths and complete the above schedule with the correct lengths.

PS 9.8 STAND-BY GENERATORS

Currently stand-by generators are not required for this project, but may be installed at a future date. This must be taken into account in the design of the electrical systems and motor control panels.

PS 9.9 LIGHTING AND SMALL POWER SYSTEMS

Buildings:

New lighting and power points will be required for both pump stations/MCC rooms and for the Guard House on each site. The Hoof Pump Station has an existing Toilet/Ablution building which will require new lighting.

All lighting and small power circuits shall be wired in PVC or galvanised conduit for all the new buildings or structures. Conduits for offices, control rooms etc shall be flush installed and cast in concrete floors, chased into internal faces of brickwork and installed inside ceiling spaces. Conduits for pump station and other industrial type buildings shall be surface mounted unless instructed otherwise by the Engineer. Isolators adjacent any plant equipment for motors shall be surface mounted and cabled from the MCC. All plugs, switches, sockets, isolators, etc. shall be Crabtree or similar and equal approved and to match existing. All electrical and associated equipment shall be SABS approved.
Exposed conduits shall be galvanized.

The installation shall be carried out as shown on the drawings or as directed by the Engineer on site where no drawing is available.
Light fittings shall be supplied and installed in positions as shown on the drawings and as quantified in the bill of quantities. Lights shall be similar to what is existing on site where applicable.

Lights and socket outlets shall be wired as follows:

- Lights: 2.5mm² including neutral & earth wires
- Sockets: 4 mm² including neutral & earth wires

- Welding Plugs: 16mm² x 4C cable

a) All light and plug circuits are to be labelled in accordance with the standard specification or as directed by the Engineer.

The following luminaires as quantified in the schedule of quantities shall be installed in the various areas as follows: -

Pump Stations , Filter Building , Stores, Workshop, Sludge Building, Chemical Dosing Buildings etc	Type A	TLF- CRA - 2 LED Double 1.5m 2 Tube corrosion resistant fluorescent fittings with polycarbonate diffusers and LED energy efficient lamps
External Areas / Outside Fittings	Type B	TLF- LRBH-16W LED external bulkhead lights with LED lamps
External Areas	Type C	TLF - LFL-100W LED floodlight with 100watt LED lamps or similar approved
Roads and General Areas	Type D	TLF- LFL-45/55W LED streetlights with photo cell and with spigots/mounting arms

Contact details for the above lighting supplier is The Lighting Factor (TLF) is Cell : 0836582489.

All work shall be carried out by qualified artisans and all work shall comply with latest versions of SANS 10142 and the Occupational Health and Safety Act and Regulation (OHS Act) . The certified person who is qualified shall issue the electrical compliance certificate (COC) .

Site Lighting:

New poles and streetlight fittings where required is to be installed as shown on drawing to be provided later or as directed on site by the Engineer.
The fittings and poles shall be similar to what existing on site where possible. The fittings required are industrial grade aluminium supplied by TLF 100W LED floodlight or streetlight TLF 45/55 LED or similar and equal approved with high efficiency and improved reflector using latest lightning technology. It would be preferred if the existing fittings can be replaced with an equivalent LED luminaire. Poles shall be 9.5m hop dipped galvanised type to match existing complete with 5amp circuit breaker, photocell etc. Cable supplies shall be as shown on the cable schedule.

All internal building and site lighting where required shall suit the existing systems on site where they exist. New lighting shall be as supplied by The Lighting Factor (TLF) or similar and equal approved by the Employer's Representative. All lighting shall of local manufacture and carry the SABS mark of approval with spares and replacements readily available.
Contact details for The Lighting Factor (TLF) is Cell : 0836582489.

PS 9.10 LIGHTNING PROTECTION AND EARTHING SYSTEMS

The earthing system for the electrical panel and equipment shall be carried out in accordance with SANS10142 "Wiring of Premises" as amended. All exposed metal parts and equipment shall be bonded to the earthing system to ensure that any fault currents are diverted to earth without causing any harm or damage to personnel or equipment.

The sewer sumps and pump stations are situated on the site with the structures therein susceptible to damage from lightning strikes; therefore is proposed to install lightning protection systems for all new structures that have a metal or concrete roof over them.
The following structures and buildings require a lightning protection and earthing system to be installed :

- Hoof Sewer Pump Station 1 & MCC Room
- Beta Metal Sewer Pump Station 2 & MCC Room

The new buildings, structures and pump stations shall be provided with a Lightning Protection system comprising of a 70mm² bare copper trench ring main around the building or structures and connected to a series of copper clad earth spikes driven in the ground, the quantity and spacings of which shall suit the ground resistivity survey and earth resistance required. All underground connections shall be exothermic welds and shall be Denso wrapped.
70mm² PVC insulated earth wires shall be connected from the trench earth and installed up brickwork or concrete walls and columns in conduit for connection to the reinforcing steel in concrete floors and to roof reinforcing and roof or intermediate structural members where installed. They shall be connected to steel trusses and steel sheeting where these are used as the roof covering. The roof terminal conductor will intercept any lightning strikes and safely divert these to the earthing system in the ground. The roof terminal conductor shall be 10 diameter solid aluminium earth conductor connected to the reinforcing steel of the roof slabs at least to all corners of the buildings or structures or as directed on site. All steel handrailing and platforms or staircases/catladders shall be bonded to the earthing system. Steel columns and other steel members shall be drilled and tapped to receive 70mm² terminations.

A 300mm long copper earth bar on standoff insulators shall be installed adjacent the MCCs in positions as shown the drawings or as directed on site. The lightning protection and earthing system shall be designed and installed by a specialist contractor in accordance with the requirements of SANS 10313, SANS 10199 and IEC62305. (latest amendments)
The new earth mats shall be connected to the existing earth systems (where existing) on site for equipotential bonding. All buildings or structures in close proximity to each other shall be cross-bonded together.
The lightning protection and earthing installation for the various structures and pump stations shall be undertaken as shown on the drawings where available. The Engineer will issue an instruction or direct the installation on site where no drawings are available. A sketch mark up may also be provided.

The test certificate and compliance certificate shall be issued for each building, pump station or structure by an accredited person and the installation earthing shall have a maximum resistance of 2 ohms and / or lower. Should this figure not be achieved, then additional copper rods/trench earth must be installed to achieve an acceptable figure. The test certificates and compliance certificates shall be submitted to the Employer’s Representative or Engineer and also be include in the O & M manuals and hand over data packs.

The Engineer shall be given at least two week’s notice to inspect and witness the testing of the lighting protection and earthing system

Surge suppression equipment shall be installed in all MCC’s and distribution boards.

All earth conductors are required to be hidden and built into surface beds, in floors, in concrete columns, in concrete walls and in brickwork. No chopping or chasing to install earth conductors will be allowed unless approved in writing by the Engineer.

PS 9.11 INSTRUMENTATION, SCADA & PLC SYSTEM

PS 9.11.1 GENERAL INSTRUMENTATION SPECIFICATIONS

All instrumentation and other equipment shall comply with the Industry Standard specifications such as IEC, BS, American or SANS standards.

Where the specifications contradict each other or where there are technical uncertainties, this project specification shall take precedence.
Full details and specifications with literature of all instrumentation equipment offered by the tenderers shall be submitted with the tender. The equipment offered shall comply with the requirements of the standard and detailed specifications.

PS 9.11.2 SCADA / MONITORING OF WORKS

A SCADA system for the works is currently not a requirement for this project, but could be incorporated at a later stage.

PS 9.11.3 PLC (NOT REQUIRED)

PLC & HMIs for the MCCs in currently not a requirement for this project, but could be incorporated at a later stage

PS 9.11.4 TELEMETRY, SECURITY AND INTRUDER ALARM

1. GSM TELEMETRY

Telemetry systems for the 2 pump stations will be required for monitoring of the pump stations status. Remote control of the pumps etc may be incorporated at a later stage.

a) Telemetry Equipment

The GSM radio telemetry system for each sewer pump station site shall consist of a transmitter / receiver, including power supply, backup batteries and surge protection. These units will be powered from a 220Vac power source or by a Solar Powered battery supply with at least 3 days backup. The GSM must be provided with an APN SIM and 24 months worth of data contract for the system. The SIM's can be any South African Network supplier as long as the network is available in the area – Vodacom / MTN / Cell-Cell / Telkom

The GSM radio equipment offered must have the following minimum I/O available:
Analog 4-20mA / 0-10Vdc inputs – 4 inputs
Digital / Counter inputs – 6 inputs
Digital outputs – 2 outputs

The GSM radio must be fully expandable for future expansion purposes via Modbus expansion cards such as Digital inputs / Analog inputs.

The GSM radio must be able to be configured to transmit it's data based off the following:

- Time based transmissions – configured to suit clients requirements
- Both digital and analog "Change-of-state" transmissions – based off criticalness of the signal.

The GSM radio must also have Modbus RTU Master functionality should this be required for communications with "external modbus" devices – ie flowmeters, level sensors etc.

The equipment offered shall be specifically designed for industrial telemetry purposes.

The GSM equipment and consumable equipment must be installed and housed in a lockable 3CR12 panel with wall mounting capabilities. The following equipment must be provided in the telemetry panel:

1) Power Supply Units
Power supply Units (12 or 24Vdc) are to be a minimum of 1.5Aoutput. These Power supply units are to have an internal Mains Failure Detection and more Importantly an Internal Load Shedding Facility to protect telemetry equipment and batteries from low voltages in case of lengthy power failures. The power supply must be capable of providing battery 12-24Vdc power to the RTU should 220Vac not be available.

2) Antenna Equipment
Antenna systems must be capable of a minimum 5dBi to ensure reliable communications.

3) Surge Protection

Surge protection shall be supplied for mains inputs and coaxial inputs.
Mains surge protection for a maximum of 250VAC shall have a nominal discharge current of 1.5kA and a maximum discharge current of 8kA.
Coaxial surge protection must have maximum voltage of 600VDC and a maximum discharge current of 10kA.

4) Enclosures

All standard enclosures supplied shall be either ALLBROX make (ALL005) or Powder Coated 3CR12 Stainless Steel with a minimum IP rating of 65. Should the enclosures be mounted externally then the IP rating must be IP68 or a Heavy Duty enclosure used to minimise vandalism.
All enclosures to be lockable.
Stainless steel or 3CR12 enclosures are preferred.

5) Level Monitoring Equipment

The system is to measure “sewage” substrate hence only ultra-sonics or RADAR equipment to be supplied for these purposes. The measuring equipment must be mounted using Stainless brackets to ensure longevity of the bracket. At Sewage sites only sealed “blind” transducers shall be used with external “Control” panels – this to minimize damage to the transducers if flooding occurs.

6) Batteries

Batteries for backup power purposes must be housed in the telemetry panel and must provide a minim of 3 days backup power for the telemetry.

7) Operator Display panel

At Pump Station 2 pumpstation the telemetry panel must have Mimic’s (level displays) to display the SUMP levels for all the sites (3) and LED’s to display pump status’s.

8) Platform

All data monitored from all the sites shall be made available on a Cloud Platform for the purposes of Real-Time display and Historical reporting (trending). This platform must be available on both Android Smartphone’s and PC’s. This platform will give the “subscribed personnel” such as Managers and Operations Personnel the ability to view the Sewage Pump Stations scheme status’s at any given time.

All alerts and alarms shall be programmed and downloaded on the Client’s office PC and smartphones. This includes all downloadable APPs etc.

The Platform hosting must allow for a minimum of 24 months – after which the Client shall renew their contract for further access with the relevant service providers.

The Platform must also the ability to send ALERTS based off critical signals to dedicated personnel.

The following signals and alerts shall be sent for each pump station (Pump Stations 1 & 2):

- Wet well or sump levels
- Wet well or sump overflow alarm and alert
- Flow (instaneous and total)
- Duty pump running
- Pumps tripped
- Pumps stopped
- Grinder running, stopped or tripped
- Power failure
- Generator running or stopped
- Generator fuel level
- Low fuel alarm
- Pump station intruder alarm

Note : Where a stand-by generator is be installed at each site and all status, alarms and alerts shall be integrated into the telemetry system.

Note that the system must be fully expandable for future remote starting and stopping and remote control of the pumping systems for each pump station.

9) Testing, commissioning , documentation and drawings

The telemetry contractor will be responsible for the full engineering of the telemetry systems and produce all GAs, wiring or other diagrams, I/O lists, functional design and control specifications, cable block and loop diagram etc complete.

He shall work closely and cooperate with the electrical contractor and MCC manufacturer to ensure full integration of the entire systems.

The telemetry contractor shall be responsible for the full testing, commissioning and integration etc of the entire telemetry and pumping system.

All testing and commissioning data sheets, as built drawings and diagrams, hand-over data packs, O & M manuals etc shall be provided.

Full training to the Client's operations and maintenance staff stall be provided.

b) Typical BOQ for Telemetry Systems

A: Site 1 – Hoof Pump Station 1 (main site – pumping to WWTW)

GSM equipment with SIM & data contract for 24 months
Complete Panel (PSU / MCC / Surge protection / terminals / Batteries / consumables)
Mimic displays for level x 2 / LED's for the 2 x Pump Station Status's
Ultra-Sonic / Radar equipment for Sump level monitoring
Installation including maximum of 20m cables to sensors

B: Site 2 – Beta Metal Pump Station 2

GSM equipment with SIM & data contract for 24 months
Complete Panel (PSU / MCC / Surge protection / terminals / Batteries / consumables)
Ultra-Sonic / Radar equipment for Sump level monitoring
Installation including maximum of 20m cables to sensors

2. SECURITY & INTRUDER ALARM

A PIR motion detector sensor shall be installed in each pump room or MCC room and wired back to the inputs on the telemetry RTU.
A siren with strobe lights shall be installed outside the pump room or MCC room and be activated when the PIR sensor is activated.
The intruder alarm system to include all control panels, keypad etc as required.

All wiring shall be installed in PVC conduit and neatly installed.

The alarm signals and alerts shall be sent via GSM telemetry to the relevant personnel at the Client's office PCs or smartphones.

The above installation is to be undertaken by the telemetry contractor.

PS 9.11.5 PARTICULAR SPECIFICATION FOR ULTRASONIC LEVEL TRANSMITTERS &

INSTRUMENTS

The contractor is to ensure that the correct level sensors has been selected before the tender closes and priced accordingly. The below specifications is to be confirmed by the level sensor supplier to ensure that it is correct for the application.

The following level transmitters and their positions are required on this project:

Instrument Ref No	Item	Sensor Location	Description/Principle	Quantity	Function	Transmitter Location	PLC/ SCADA	Drawing No.
IN-A14-LV-001	Level sensor 1	Hoof Pump Station 1 - Sump	Flow Measurement %/m	1	Level monitoring, Control	MCC01	Future	N/A
IN-A14-LV-002	Level sensor 2	Beta Metal Pump Station 2 - Sump	Flow measurement %/m	1	Level monitoring, control	MCC02	Future	N/A

SPECIFICATION FOR LEVEL TRANSMITTERS & INSTRUMENTS

Level sensors shall be IFM type UIT507 or similar approved ultrasonic diffuse reflection sensor; M30 x 1.5 / L = 118.8 mm; Sensing range 600...8000; (Target: 1000 x 1000 mm); normally open / normally closed;
(parameterizable + 1x current output); analogue; DC PNP; M12 Connector; IP 67; Ambient temperature -20...70 °C,
The sensors shall be provided with mounting brackets type IFM E10737 Angle bracket.
Sensor cable shall be type IFM EVC087 or similar approved connecting cable with socket 20m;
Operating voltage < 250 V AC.
PUR; housing materials housing: TPU orange; Sealing: FKM; IP 65; IP 67; IP 68; IP 69K; Free from silicone; Halogen-free; Gold-plated contacts.

Separate level digital displays shall be installed in a separate indicator panel as specified elsewhere and is to be priced as part of the indicator panel.

The transmitters shall be installed inside the relevant MCCs (motor control centres) or in a separate panel/s with a viewing window adjacent the MCC, refer to the schematic single line diagrams of the motor control centres and distribution boards or as directed on site by the Engineer.

PS 9.11.6 MAG FLOW METERS (raw sewage)

The contractor is to ensure that the correct mag flow meter has been selected before the tender closes and priced accordingly. The below specifications is to be confirmed by the flow meter supplier to ensure that it is correct for the application.

Outdoor type IP67 rated mag flow meters suitable for raw sewage are required as follows :

Instrument Ref No	Item	Instrument Location	Description/Principle	Quantity	Pipe diameter (mm)	Function	PLC/ SCADA
FM-001	Flow meter – 1 DN 200	Rising main from Hoof Sewer Pump Station to the Ex Sewage Treatment Works Inlet	Electronic/ flow	1	DN 250	Remote flow monitoring + local	Future

		HOW					
FM-002	Flow meter – 2 DN 150	Rising main from Beta Metal Sewer Pump Station to the Ex Sewage Treatment Works Inlet HOW	Electronic/ flow	1	DN 200	Remote flow monitoring + local	Future

The mag flow meters shall be set, connections checked, tested and commissioned on site by the supplier of the meter. All test and connections diagrams to be verified and confirmed. The test reports and diagrams shall be submitted on commissioning of the meters and included in the O & M manuals.

PS 9.11.7 Electromagnetic flowmeter for DN150 or DN 200 completely filled pipelines suitable for raw sewage

Krohne Optiflu x 2100W DN150 & DN200 PN16 or Similar (For Raw Sewage)

For completely filled pipelines with "pulsed DC field" measuring system. Measurement is unaffected by pressure, density, viscosity, conductivity (> 20 µS/cm), direction of flow and consistency of liquid. Suitable for the exact flow measurement of water, wastewater, sludge, thick sludge and additives.
Wet calibration using a certified test stand in accordance with
EN 17025 and EN 29104 (test stand is 3 times more accurate than the device under test).
Length of the sensor as per DIN and/or ISO 13359. Fully welded steel-plated coil housing, protective paint.
Up to 20 hours of factory sensor function/quality control in climatic exposure test cabinet.
Featuring diagnostics function according to VDI/VDE, i. e. automatic monitoring of operating condition of complete device, installation conditions and medium.

• Including calibration certificate
• Includes idling detection
- Type of medium for flow measurement - Raw Sewage
- Bi-directional flow measurement
- Including standard diagnostic functions:
  - Conductivity measurementt
  - Detection of electrode deposits/corrosion
  - Temperature display
  - Detection of gas bubbles/solids
- Measuring tube liner: Hard rubber (as per KTW as well as DVGW W270 recommendations)
- Process temperature: -5…80°C I 23…176°F
- Nominal size DN 150 & DN 200 = Pressure stage PN 16
- Measuring electrodes: Hastelloy C
- Flange material: polyurethane-coated carbon steel
- Signal output/communication: 1 x 4...20 mA, Impulse/frequency output, status output, galvanically separate
- Measuring accuracy: ±0.3 % of measured value ±1 mm/s
- Display LCD 3-line for flow and counting in physical sizes, keyboard operation
- Ex approval: None
- Grounding / earthing rings: incl. 1 full set grounding rings made of stainless steel 1.4404/316L
- Auxiliary power: 200-260 V AC
- Design: Separate design, Die-cast aluminium wall-mount housing

- Cable connection: M20 x 1.5
- Sensor cable/converter: 30m cables
- Protection class: as per EN 60529, sensor IP 67 | NEMA 6 and converter IP 66/67 | NEMA 4/4X/6, aluminium connection box

Manufacturer/Type: a) KROHNE OPTIFLUX 2100 W DN150 or DN200 or similar and equal approved suitable for raw sewage applications.

The flow meters will be installed in meter chambers to be constructed by the civil contractor.

Full technical details of the flow meters shall be provided and submitted with the tender for evaluation purposes. Full QCP documentation is to be provided for approval prior to ordering of the units.

PS 9.11.8 UPS & UPS DB

PS 9.11.8.1 UPS

Not required.

PS 9.11.8.2 UPS DB 01

Not required.

PS 9.12 DIGITAL INSTRUMENT PANEL – DIP 01 (NOT REQUIRED)

Not required.

PS 9.13 OTHER INSTRUMENTATION

a) Pressure Transducer

Not required.

b) Pump Casing Temperature Transducer (Supplied with Pump)

Grundfos Tempcon, IMF or other approved motor PT100 thermistors (one per phase) including their corresponding controllers shall be supplied with the pumps where specified. The installation of the controllers and wiring in the MCC shall be undertaken by the electrical contractor.

c) No Flow Switch

Where specified, an IMF electronic (or equal and equal approved) no flow switch shall also be installed on the delivery line of the discharge of the pumps. IMF switches are preferred. An ½ inch BSP socket shall be welded on the pipework for this. The controller shall be installed and wired in the MCC for the no flow protection. These switches shall be used for clear water pumps. IMF flow switches are preferred.

Paddle type no-flow switches shall be used for dirty raw water or de-sludge water pumping systems.

d) Low Level Cut-Out Switch

Low level float switches for pump dry run protection shall be as supplied by AC/DC and must switch the pump circuit to stop the pumps in the event that the level

in the sump or reservoirs reaches a low level.
The floats must be suspended and fixed on suitably sized stainless steel chain with a weight at the bottom of the chain. A CCG type junction box shall be installed adjacent the floats or electrodes for termination of the cables from the MCC.

Where specified, level electrodes shall be used for the low level cut out of the Pumps where the sludge content in the water is high.

Openings is the roof shall be provided by the civil contractor. A suitable HDG cover with vandal proof locks shall be installed over the floats or electrodes.

PS 9.14 VENTILATION SYSTEM

Where specified and required, wall or roof mounted Luft or similar and equal approved extract fans shall be installed extracting the air from the MCC Room to the outside air. These fans shall be switched via the starter contactors and push buttons in the MCC or DB.
Electrical isolators shall be provided adjacent the fan units.

Fans required in the abstraction pump station are Luft type LPA500/43F - 1350RPM 380/50 0,37kW 1,3Amps with Luft WC500 external wall cowl.

The specification of the fans can be found in the bill of quantities.

Air intake louvres or grilles required in brickwall or roof sheeting etc shall be provided by the civil contractor where required.

Openings for fans in brickwork and roof or side sheeting shall be provided by the civil contractor including any weather louvres or grilles etc. Mounding frames and flashing for fans in roof sheeting or side cladding shall be provided by the contractor.

PS 9.15 FIRE PROTECTION

The fire protection installation shall comprise of the following:

- Portable handheld fire extinguishers of 9kg dry chemical power and 5kg CO2 extinguishers installed in plant rooms or pump stations.
- All associated statutory signage for the above hose reels and extinguishers. Signage shall be rivetted or screwed to walls or doors.

All fire water pipes where required shall be hot dipped galvanized screwed pipes. The pipes shall be painted fire water red with primer coats. Painting shall be carried out in accordance with the manufacturer’s instructions.

The installation shall be carried out as shown on the drawings or as directed by the Engineer where no drawing exists.
The fire protection installation shall be carried out in accordance with SANS10400 Part T & Part W.

PS 9.16 SIGNAGE

Signage inside and on the outside of the door to the pump stations or other buildings shall be provided in compliance with OHS Act (85 of 1995) and SANS 10142-1. In addition, a sign with the designation of the relevant pump station shall be fixed above the pump station door. A sign installed on the outside of the door shall read “UNAUTHORISED ENTRY NOT PERMITTED or NO UN-AUTHORISED ENTRY, ”

Standard off the shelf “WARNING ELECTRICTY DANGER” signs & “MACHINE STARTS AUTOMATICALLY DANGER” signs shall be installed at all pump stations and other buildings as indicated by the Engineer.

A label no smaller than 80mm high shall be mounted adjacent to each pump to identify it as a “PUMP 1 or “PUMP 2” etc. Number plate type signage is required adjacent each pump.

PS 9.17 ELECTRIC MOTORS

All LV electric motors shall comply with the requirements of IEC/SANS60034 and SANS1948 and as per the Standard Specifications or as specified under the mechanical specification for pumps or other mechanical plant.

Motors above 5 kW shall be premium efficiency minimum IE3 specifications.

Motors above 5 kW shall be fitted with anti-condensate heaters. Motors above 5 kW shall be fitted with thermistors, one per phase.

Where required or specified, motors shall be fitted with DE & NDE bearing vibration and bearing temperature sensors. These requirements will be specified under the pumping or mechanical plant specifications.

Were required, motors shall be wired for VSD or soft starter operation (refer to electrical; MCC specifications for details)

PS 9.18 TESTING

PS 9.18.1 General

The contractor shall provide all equipment for testing purposes and arrange for the Employer’s Representative or Engineer to witness such tests.
No test will be recognised unless it is documented in an agreed format. The test procedure shall ensure that every combination of switches and events is tested for correct functioning and each such combination will be on the test sheet and checked off.
The contractor shall supply all test equipment and consumables.
The contractor shall conduct tests at the following stages. The Employer’s Representative or Engineer shall be advised of the tests two weeks in advance of the test dates.

a) At manufacturers works before equipment is released to site
b) During installation where testing is necessary before final connections are made.
c) After installation is complete. This is to be witnessed by the Employer’s Representative.

At each stage tests shall be carried out by the contractor and a typed report submitted to the Employer’s Representative or Engineer. After submission of the test report, the Employer’s Representative or Engineer may call for all or some of the tests to be repeated in his presence.
Should any test be unsatisfactory at this time, the Employer’s Representative or Engineer reserves the right to have his reasonable abortive costs deducted from the contract sum.
The pump and civil contractor shall be in attendance when the pumps and pipework or other equipment is tested and commissioned.

PS 9.18.2 Workshop Tests

The Employer’s Representative or Engineer shall be granted the opportunity of inspecting progress at the manufacturer’s works.
The motor control centre or DBs shall be erected in the workshop complete with PLC, level, controls, instrumentation etc. and operation shall be proved by simulation of operating conditions.
Motor Control Centres
Inspections are required when the motor control centre metal work is complete but unpainted, after 80% of the components have been installed and wired and on final completion.

On final completion the following factory acceptance tests (FAT) shall be carried out in addition to any tests that the contractor or Engineer may wish to carry out.

1. Insulation resistance of busbars and wiring shall be measured at 500 volts DC using a hand-cranked megger.

2. Busbars shall be pressure tested at 2 000 volts AC for 10 minutes.

3. Small wiring shall be pressure tested at 2 000 volts AC after disconnection of voltage sensitive devices.

4. Functional and simulation tests of control and interlocking circuits shall be carried out.

5. Operation of current transformer driven equipment shall be proved by primary current injection. The current transformer ratio and polarity shall be checked.

6. Indicating instruments shall be checked at the normal operating point and calibrated against an instrument of certified accuracy. Adjusting screws shall be sealed by means of paint.

7. Test instrumentation used, the calibrating authority and calibration date shall be recorded.

8. The test results shall be recorded in the agreed format and submitted to the Employer's Representative for approval.

The equipment may not be released to site before the test report has been approved by the Employer's Representative or Engineer.

PS 9.18.3 Site Tests

The following site acceptance tests (SAT) shall be carried out in addition to any tests that the contractor may wish to carry out or other tests required by the Engineer.

Motor Control Centres

All tests carried out at the manufacturer's works shall be repeated on site and the test report endorsed accordingly.

Cables

The insulation resistance of power and control cables shall be measured at 500 volts DC using a hand cranked megger and the result recorded.
The insulation resistance shall be measured between each core and all other cores plus armouring and between armouring and earth.
The earth loop impedance of each cable shall be measured after glanding off and bolting into place but before connection. A null-balance megger shall be used, and the result recorded.

Instrumentation

Each instrument loop shall be calibrated by simulation of the measured quantity at 20%, 50%, 80% and 100% of the range.
Calibration shall be carried out in accordance with manufacturer's instructions or in a manner to be agreed with the Employer's Representative in the absence of such instructions.
An ohmmeter shall be used to measure resistance of instrument cable loops and resistance from each core to all other cores plus earth and/or screen. The results shall be recorded.

PS 9.18.4 PLC Process and Tests (NOT REQUIRED)

Refer to the standard electrical specifications for the PLC specification testing procedures.

PS 9.18.4.1 Project Flow (PF)

a) Propose and develop control philosophy (consult with Client and Engineer)
b) Review above philosophy
c) Raise queries with Client or Engineer
d) Receive final control philosophy from Client and Engineer
e) PLC Quality Control and FDS, Processes and Procedures (where required)
f) Program PLC (where required)
g) Create HMI Screens (where required)
h) Send HMI screens for approval (where required)
i) Review and finalise screens with Client and Engineer
j) Factory acceptance test
k) Site acceptance test

PS 9.18.4.2 Factory Acceptance Test (FAT)

a) Visual inspection to confirm that the drawing matches the physical panel.
b) Input & output testing (Confirm correct wiring to and from PLC or other control systems)
c) Verify HMI signals correspond to item 1 (where required)
d) Verify telemetry signals (where required)
e) Operating and control philosophy
f) All external signals to be simulated

PS 9.18.4.3 Site Acceptance Test (SAT)

a) Input & output testing of field wiring and marshalling
b) Test all signals as per FAT

PS 9.18.4.4 Site Reticulation

All tests specified in SANS 10142-1 shall be carried out on all circuits connected to the MCC and sub distribution board.

PS 9.19 Certificate of Compliance of Electrical Installation and Motor Control Centres

a) A separate certificate of compliance is required for each complete electrical installation, building or structure in addition to each DB or MCC.
b) A certificate of compliance, type testing and compliance with SANS 1014-2 for each motor control centre is required from the contractor.

PS 9.20 COMMISSIONING

Commissioning shall proceed in accordance with a previously agreed procedure which shall be documented, and which shall form the basis of the commissioning report.

During commissioning the operating parameters of each piece of equipment and each device shall be established and recorded at no-load, average and full load conditions.

The final set-points of all adjustable devices shall be recorded.

Full details of the commissioning procedures for the entire plant as a whole is specified elsewhere in this contract document. Where no commissioning plan is available, the contractor shall submit same to the Engineer for comments and approval

PS 9.21 SLEEVES & MANHOLES

The electrical contractor shall be responsible to supply and install cable sleeves in positions shown on the drawings under in ground trenches, roadways or through buildings and chamber walls. The sleeve requirements are shown on drawing number and on the individual building or pump station drawings. Where no drawing exists, the Engineer will

The manholes and covers as shown on the above drawings shall be supplied and built by the main civil or building contractor. The electrical contractor shall assist to co-ordinate the manhole construction in conjunction with the placing of the sleeves.

PS 9.22 EARTHING THE COMPLETE INSTALLATION

Supply, install and connect up and effectively earth the complete installation in accordance with the relevant clauses of the Standard Technical Specification contained herein together with the South African Bureau of Standards SANS10142-1 “Code of Practice for the Wiring of Premises” and the earthing regulations of the relevant supply authority.

Earthing of the buildings must meet the requirements of SANS 10313 as amended and SABS/IEC 61024 as amended. The main earth from the Supply Authority must not be relied upon as an effective ground earth.

The testing of the earthing and lightning protection systems must be witnessed by the Clients representatives and the Engineer.

PS 9.23 CONTRACTOR TO DESIGN AND ENGINEER

It is the contractor’s responsibility to design and engineer the motor control centre power and control circuitry installation in accordance with the specification and good engineering practice.
The design shall be undertaken by personnel who are able to demonstrate qualifications and experience in the field of water treatment and pumping plant including control systems and telemetry. The Contractor shall approve and sign design drawings and as-built drawings.
The Client’s Employer’s Representative or Engineer will review all drawings for conformance with the design concept but will not confer formal approval for construction.

PS 9.24 PREFERRED EQUIPMENT

PS 9.24.1 General

The tenderer shall base his main tender price on the equipment listed and as specified elsewhere in this specification.

The tenderer may however offer alternative equipment, but in this event:

a) It shall be offered in a covering letter as an add or an omit to the main tender price.
b) He shall submit sufficient documentation at the time of tender to allow the Client or Employer’s Representative to evaluate the equipment.
c) He shall make himself available during the tender adjudication period for one or more discussions on the detail of the equipment and its operation in a system.
d) The decision as to final choice of equipment shall rest with the Client or Employer’s Representative but this shall not relieve the contractor of his contractual obligations in terms of the specification.
e) All alternatives shall be approved by the Employer’s Representative or Engineer prior to the tenders closing.

PS 9.25 ELECTRICAL PANEL AND CIRCUIT DIAGRAMS

Complete control panel layouts, distribution boards layouts, circuit diagrams and wiring diagrams indicating clearly the proposed method of wiring shall be furnished. Panel layouts shall show dimensions

and complete schedule of equipment together with full description, type, manufacturer, code, reference number, rating etc. of all electrical equipment and components. No variation from such diagrams as submitted or as subsequently modified to meet the requirements of the Employer's Representative or Engineer, will be permitted without the prior approval in writing of the Employer's Representative or Engineer. Layouts and wiring diagram/components shall be approved by the Employer's Representative or Engineer prior to manufacture of the panels, all in accordance with the Standard Technical Specification. PLC I/O diagrams and I/O lists shall be included in the drawings and wiring diagrams.

On completion of the internal wiring to be carried out under this Section of the Contract, complete circuit diagrams indicating the wiring "as executed" shall be supplied to the Employer's Representative or Engineer prior to the issue of the Certificate of Completion.
The drawings shall be included in the operating and maintenance manuals to be supplied under the electrical and mechanical section. Three copies of the full plant operating and maintenance instructions for the mechanical process and electrical equipment shall be supplied.

PS 9.26 SPARE PARTS: ELECTRICAL

Tenderers shall allow for the supply and delivery of spares for the electrical equipment which they consider should be held in stores, but in any case they shall include for the supply of one complete set of contacts for each type of starter and similarly for completed sets of operating coils. The electrical spares allowed for shall be described in the Annexures or on a separate schedule and submitted with the tender.

PS 9.27 PAINTING OF PANELS

Where sheet metal is used, the whole of the metal work is to be treated against corrosion with an approved rust removal inhibitor, then a primer and finally finished with two coats of an approved paint of selected colour all in accordance with the Standard Technical Specification.

PS 9.28 THE COMPLETE INSTALLATION

The meaning and intent of this electrical specification is that at the completion of the Contract, the Client shall be provided with a finished installation, complete in all respects, tested and passed as ready for use.

PS 9.29 HAND OVER, O & M MANUALS AND DATA PACKS

The contractor shall supply and deliver to the Clients Representative or Engineer and Client 5 hard copies and 4 soft copies of the O & M manuals and data packs on successful testing and commissioning of the complete electrical, mechanical, process and instrumentation installations for the project made up as follows as a minimum:

- Electrical COC's (one for each MCC, DB and for each building or structure)
- Earth test certificates
- As built DB and MCC layouts and wiring diagrams
- As built motor control panel layouts and wiring diagrams including component lists
- MCC quality control and test reports
- Factory routine test certificates (SANS1473-1)
- Partial type test certificates for MCC over 10Ka
- MCC paint thickness certificate
- FAT & SAT inspection and test reports
- Instrumentation equipment and details (flow meters, actuators, solenoid valves etc complete)
- Programmable and manual parameters of all electronic and instrumentation equipment
- Instrumentation and electrical devise settings and set-points
- As built FDS (control functional design specification and operational specification)
- Cable specifications and cable schedule
- PLC, HMI and telemetry specifications
- PLC and HMI program

- Process control network diagrams
- PLC, HMI and telemetry wiring diagrams
- Telemetry equipment and layout drawings and diagrams
- All equipment specifications and literature with brochures including cables, lights etc
- Cable block diagrams
- Instrument loop and block diagrams
- Specifications and details of all electrical equipment used on the project including literature and brochures. To include transformers, LV & MV equipment etc.
- Details of all pumping plant, valves, pumps, motors and other mechanical equipment used on the project
- Details of all chemical dosing pumps and other equipment
- Details of all instruments used on the project (flow meters, level sensors, level floats, flow switches, pressure switches etc)
- Details of all dosing pumps and other equipment used on the project
- All maintenance and servicing schedules of all electrical, instrumentation and mechanical equipment
- The operating and maintenance instructions for all electrical, instrumentation and mechanical equipment, valves, pumps, motors etc
- OEM manuals of all mechanical, electrical and instrumentation equipment
- Fault finding procedures and instructions
- Supplier details of all major equipment
- QCPs of all equipment
- Calibration certificates of instruments and other equipment
- Guarantee certificates
- Pipework and plant drawings
- As built drawings and site and building cable schematics and layouts

Only items above that pertain to this project will apply.

Training :
Full training shall be provided to the Client's operations and maintenance staff on all the electrical, instrumentation and mechanical equipment pertaining to this project.

The details of the contract and details of the contractor and sub-contractors must be included in the manuals. The files must comprise an index with fly sheets.

The contractor shall submit draft copies of the manuals to the Engineer for comment and approval prior to compiling and submitting the final manuals. The manuals and documents must be available before the final commissioning and hand-over of the project to the Client.
The requirements and details for other equipment are found elsewhere in the tender documents and should be read in conjunction with this specification. The above are minimum requirements and the contractor shall submit all other documents deemed necessary for the operation and maintenance of the plant.

PS 9.30 GUARANTEE, FINAL INSPECTION, MAINTENANCE & HAND-OVER

A final inspection will be conducted jointly by the Employer's Representative or Engineer, the Contractor or the Main Contractor on satisfactory completion of all official tests. This inspection may be phased where a Contract is to be taken over in sections by arrangement with all parties concerned.
A list of defects, remedial or incomplete works requiring attention will be drawn up following this inspection and issued to the Contractor for his immediate attention.
Once the items listed have been attended to the satisfaction of the Employer's Representative or Engineer, the Contractor shall issue a certificate of compliance, thereafter a completion certificate will be issued by the Employer's Representative or Engineer.
The contractor shall arrange for the handover of the completed electrical and mechanical installations to the Employer's Representative or Engineer and Client on successful commissioning of the works.

The complete electrical and instrumentation system shall be guaranteed for a period of twelve months from the date of the practical completion system when the Client takes beneficial use of the equipment. During the guarantee period the contractor shall maintain the electrical and pumping system where applicable for a period of twelve months. The maintenance shall include greasing of all bearings and moving parts, topping up of any fluids, checking for loose connections and tightening of terminals and bolts, measuring insulation resistance, checking for vibration and noise and general conditioning monitoring on all pumps, motors, valves etc. The contractor shall also check that all indicator lights are working, test earth leakage units, test and check stop locks and all control circuitry and instrumentation or any other checks and tests that are required.

The project will not be signed off for payment and hand-over before all snags identified in the preliminary inspection are complete and a compliance certificate and test report is issued.

C4 SITE INFORMATION

The following locality sketch is included overleaf:

Site Locality Plan



C5 ANNEXURES

C5.1 DRAWINGS

The drawings issued to tenders as part of the tender documents must be regarded as provisional and preliminary for the tenderer's benefit to generally assess the scope of work.

The work shall be carried out in accordance with the latest available revision of the drawings approved for construction

At commencement of the contract, the Engineer shall deliver to the Contractor copies of the AFC drawings and any instructions required for the commencement of the works. From time to time thereafter during the progress of the works, the Engineer may issue further drawings for construction purposes as may be necessary for adequate construction, completion and defects correction of the works.

All drawings and specifications and copies thereof remain the property of the Employer, and the Contractor shall return all drawings and copies thereof to the Employer at the completion of the contract.

The drawings listed in the table overleaf have been bound into the document.

Tenderers are to ensure that they receive a complete set of the tender drawings and must immediately inform the Engineer of any drawings that are missing so that further copies can be issued.

HOOF PUMP STATION

NUMBER	REV	DESCRIPTION
SITE LAYOUT DETAILS		
V62-02-03-001-LP-T-00	0	Site Locality Plan
ACCESS ROAD LAYOUT		
V62-02-05-002-LAY-T-00	0	Hoof Access Road Layout (0,00km – 0.131km)
PUMP STATION DRAWINGS		
V62-02-04-003-PS-T-00	0	Hoof Pump Station (Mechanical)
V62-02-04-004-PS-T-00	0	Hoof Pump Station (Civil Works)
V62-02-04-005-GHPSE-T-00	0	Guard House Plan, Section and Elevations (No Ablution)
GENERAL DETAILS		
V62-02-03-006-DET-T-00	0	Door, Window, Gate Schedule And Details
V62-02-03-007-FDET-T-00	0	Fence Details
V62-02-03-008-DET-T-00	0	Standard Sewer detail
V62-02-03-009-PBPCDET-T-00	0	Sewer Pipe Trench Bedding And Pipe Channelisation Details
V62-02-03-010-SB-T-00	0	Project Sign Board Details

BETA METAL PUMP STATION

NUMBER	REV	DESCRIPTION
SITE LAYOUT DETAILS		
V62-02-03-001-LP-T-00	0	Site Locality Plan
ACCESS ROAD LAYOUT		
V62-02-05-002-LAY-T-00	0	BETA METAL Access Road Layout (0,00km – 0.131km)
PUMP STATION DRAWINGS		
V62-02-04-003-PS2-T-00	0	BETA METAL Pump Station (Civil Works)
V62-02-04-004-PS2-T-00	0	BETA METAL Pump Station (Mechanical)
V62-02-04-005-GHPSE-T-00	0	Guard House Plan, Section and Elevations (Ablution)
GENERAL DETAILS		
V62-02-04-006-DET-T-00	0	Door, Window, Gate Schedule And Details
V62-02-03-007-FDET-T-00	0	Fence Details
V62-02-03-008-DET-T-00	0	Sewer Manhole and Connection Details
V62-02-03-009-DET-T-00	0	Standard Sewer Details
V62-02-03-010-SB-T-00	0	Project Sign Board Details



HOOF PUMP STATION LAYOUT

NOTES

REV. NO.	DATE	DESCRIPTION

CLIENT DEPARTMENT SIGNATURES

APPROVED BY

SIGNATURE

Checked by Professional Consultant

Signature: Date:

Consultant

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DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

Project

REFURBISHMENT OF HOOF SEWER PUMP STATION

Drawing description

LOCALITY PLAN

Drawn: **ZULU LLP**	Date: **SEPTEMBER 2025**
Scale(s): **AS SHOWN**	Sheet No.: **Sheet 1 OF 1**
Consultant Drawing number **V62-02-03-001-LP-T-00**	Drawing Size **A0**
Client Drawing number	

NOTES

1. All levels, dimensions and setting out details to be verified on site prior to construction.
2. All existing drainage culverts are to be inspected , and any found in unservicable condition are to be replaced unless shown otherwise.
4. Existing road signs, services and fencing affected by construction are to be removed/relocated where necessary.
5. Underground service crossings and markers are to be in accordance with SD1001 - 3.
6. Signage schedule to be issued to TBC and revision issued.
7. All new road signs and road marking requirements are to conform to the South African Road Traffic Signs Manual (SARTSM).
8. All work is to be carried out in accordance with "COLTO Specifications for Road and Bridge Works for State Road Authorities."
9. All survey and setting out data provided is based on (WGS 84)(LO 31)
10. All road levels and setting out to be confirmed by Resident Engineer prior to construction
11. All stormwater infrastucture levels to be determined onsite by Resident Engineer. Prior to commencement of construction.
12. Driveway Access - Stormwater Concrete Pipe crossings and headwall will be confirmed on site by Resident Engineer. Drawings will be revised accordingly

HORIZONTAL ALIGNMENT CO-ORDINATE LIST

POINT	CO-ORDINATES - LO 29 Y	X	km DIST.	RADIUS
START	87 773.156	3 029 796.023	0.000	
BCC 1	87 787.553	3 029 812.871	0.022	20.00
PI 1	87 798.197	3 029 825.327		
ECC 1	87 788.080	3 029 838.214	0.050	
BCC 2	87 774.365	3 029 855.683	0.072	100.00
PI 2	87 762.462	3 029 870.845		
ECC 2	87 745.776	3 029 880.496	0.110	
END	87 727.148	3 029 891.269	0.131	
END TP	87 730.931	3 029 874.984		



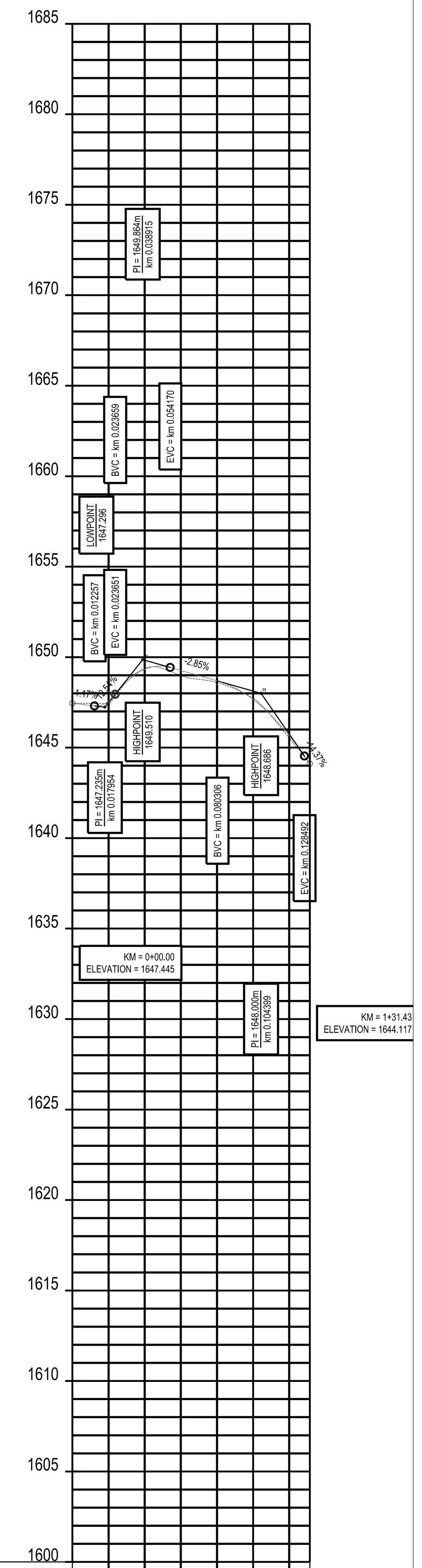
HOOF ACCESS ROAD LAYOUT
SCALE 1:250

MATERIAL LEGEND

- Soil Survey Sample Pits
- Soil Survey Auger Holes
- Seismic Probes
- Boreholes

NOTES:

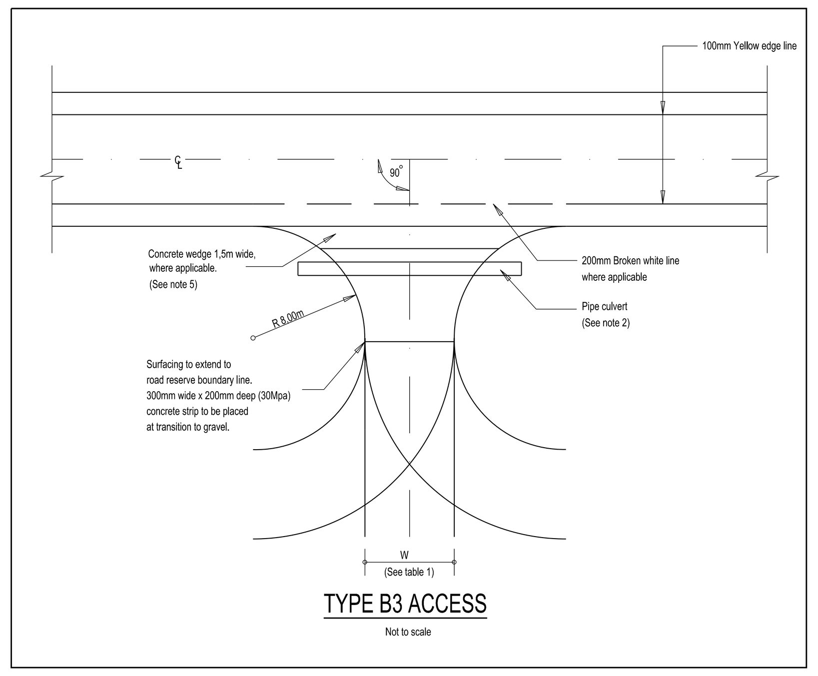
1. All levels, dimensions and setting out details to be verified by the Consultant and Contractor on site prior to construction.
2. All roadmarking is to be verified on site according to the SARTSM.
3. Pavement layerance as per typical road sections detail.
4. All V-drains to be Concrete Lined as per Typical Section



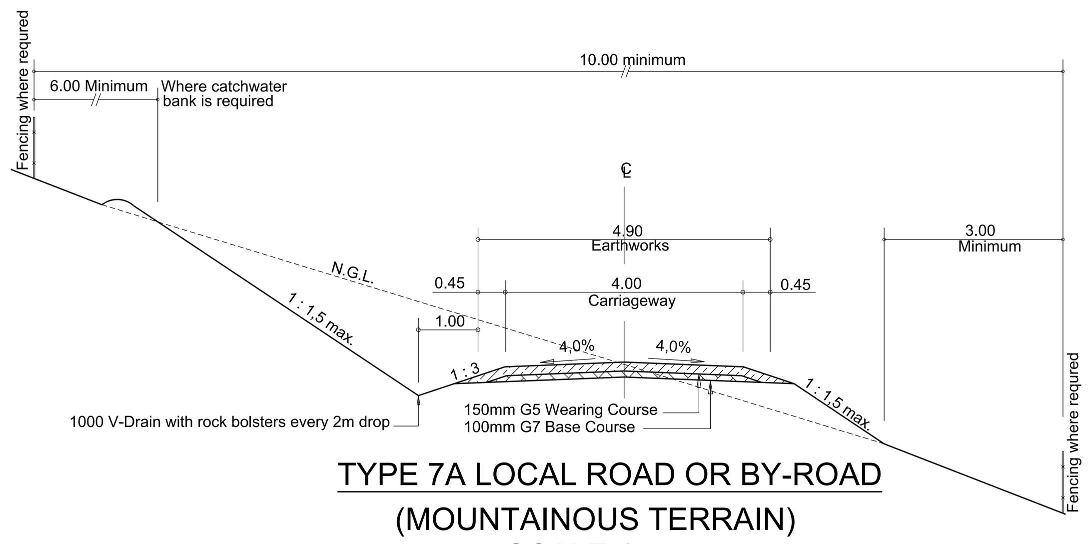
Left Hand Side	Retaining Walls	
	Guardrails	
	Subsoil Drainage	
	Side Drains	
	Centre Line Road Marking	
	Side Drains	
	Subsoil Drainage	
	Guardrails	
Right Hand Side	Retaining Walls	

Earthworks Quantities	Cut Depth (m)		0.000	-0.135	0.052	-0.272	-0.093	0.070	-0.139	0.000
	Cut / Fill			-0.135	0.052	-0.272	-0.093	0.070	-0.139	
	Fill Depth (m)		0.000	0.135		0.272	0.093		0.139	0.000
Vertical Alignment	Grades %		-1.17% 12.54%		-2.85%			-14.37%		
	Vertical Curves		VCL=11 m K=0.8	VCL=31 m K=2.0				VCL=48 m K=4.2		
	Final Road Levels	Left Edge	1647.386	1647.513	1649.268	1649.205	1648.635	1647.603	1645.614	1644.058
		Centre Line	1647.445	1647.437	1649.379	1648.991	1648.601	1647.731	1645.533	1644.117
		Right Edge	1647.386	1647.513	1649.268	1649.205	1648.635	1647.603	1645.614	1644.058
C/L Ground Levels			1647.445	1647.437	1649.379	1648.991	1648.601	1647.731	1645.533	1644.117
Superelevation	Left Hand Edge / Right Hand Edge									
Horizontal Alignment			CURVE # LEFT/RIGHT L= 27.45 T= 16.38 R= 20.00 Ø= 358° 48' 40" e= 5.85	22.161	49.615	71.824	CURVE # LEFT/RIGHT L= 38.09 T= 19.28 R= 100.00 Ø= 49° 02' 40" e= 1.84	109.909		
Chainage Distance (km)			0.000	0.020	0.040	0.060	0.080	0.100	0.120	0.131

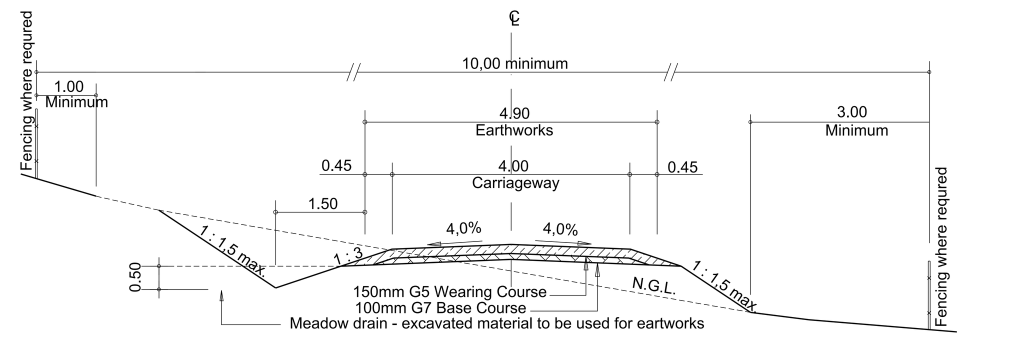
LONGSECTION HOOF ACCESS ROAD
SCALE 1:250



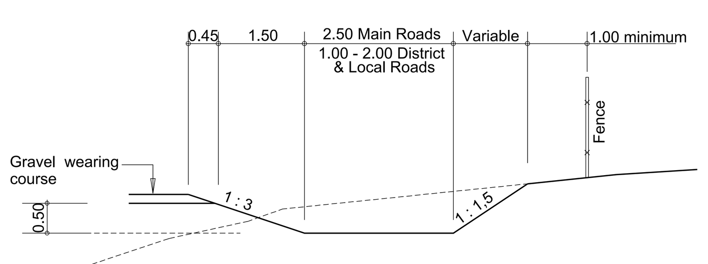
TYPE B3 ACCESS
Not to scale



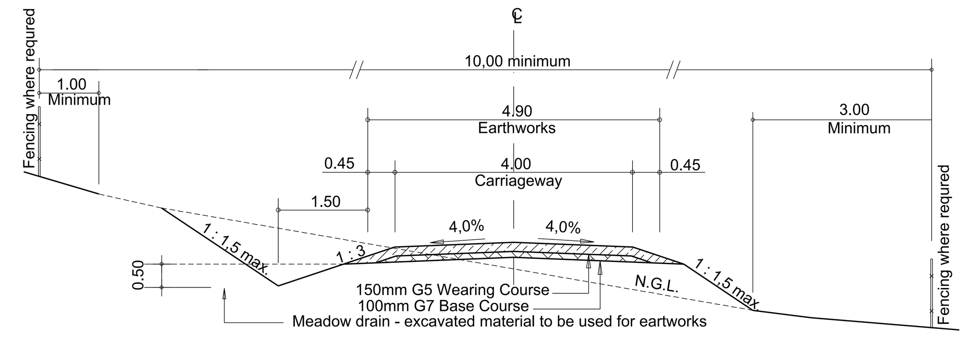
TYPE 7A LOCAL ROAD OR BY-ROAD
(MOUNTAINOUS TERRAIN)
SCALE 1:75



TYPE 7A LOCAL ROAD OR BY-ROAD
(ROLLING TERRAIN)
SCALE 1:75



MEADOW-DRAIN
SCALE 1:75



TYPE 7A LOCAL ROAD OR BY-ROAD
(ROLLING TERRAIN)
SCALE 1:75

REV. NO.	DATE	DESCRIPTION

CLIENT DEPARTMENT SIGNATURES

APPROVED BY

SIGNATURE

Checked by Professional Consultant

Signature: Date:

Consultant

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DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

Project

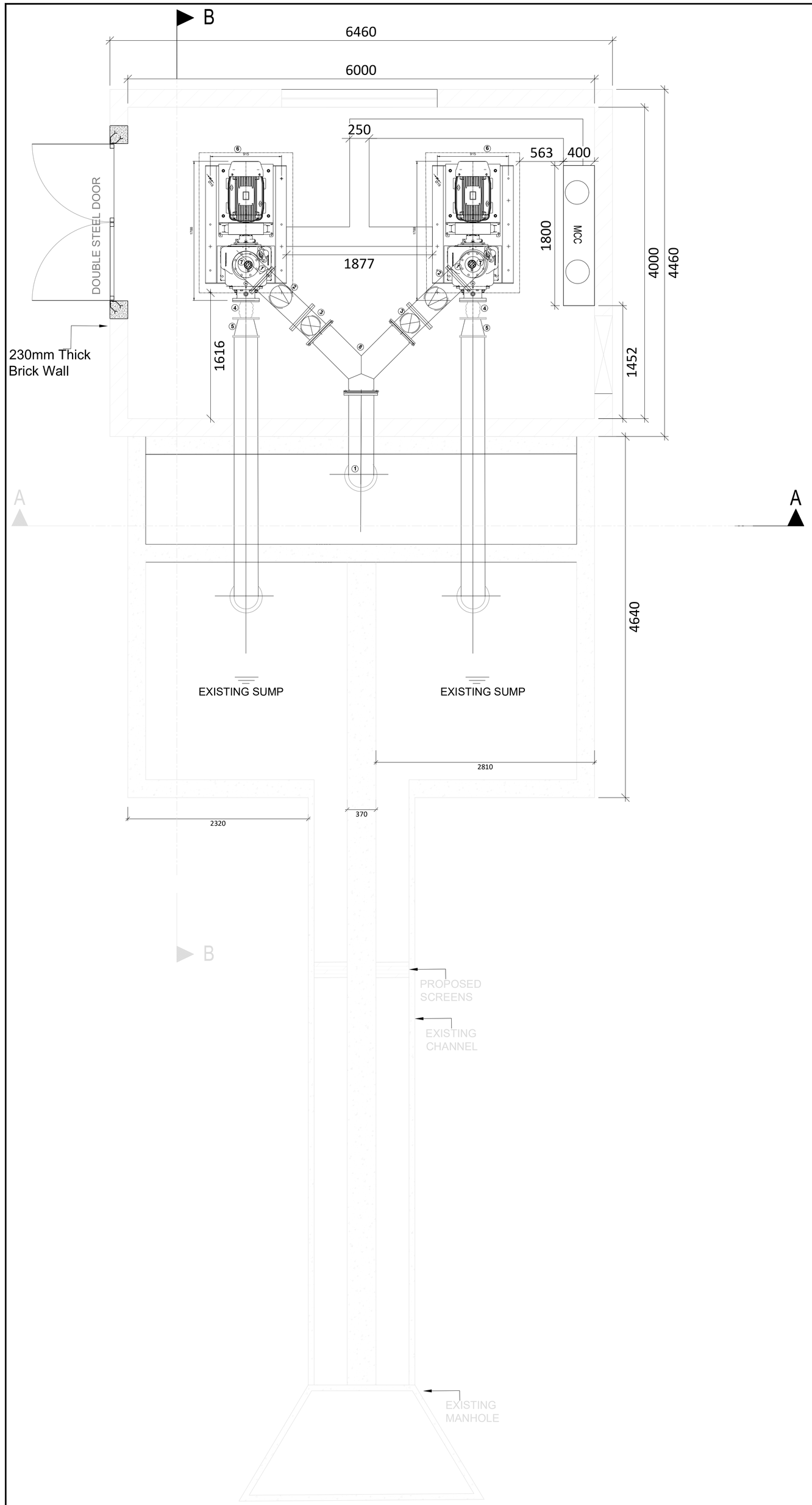
REFURBISHMENT OF HOOF SEWER PUMP STATION

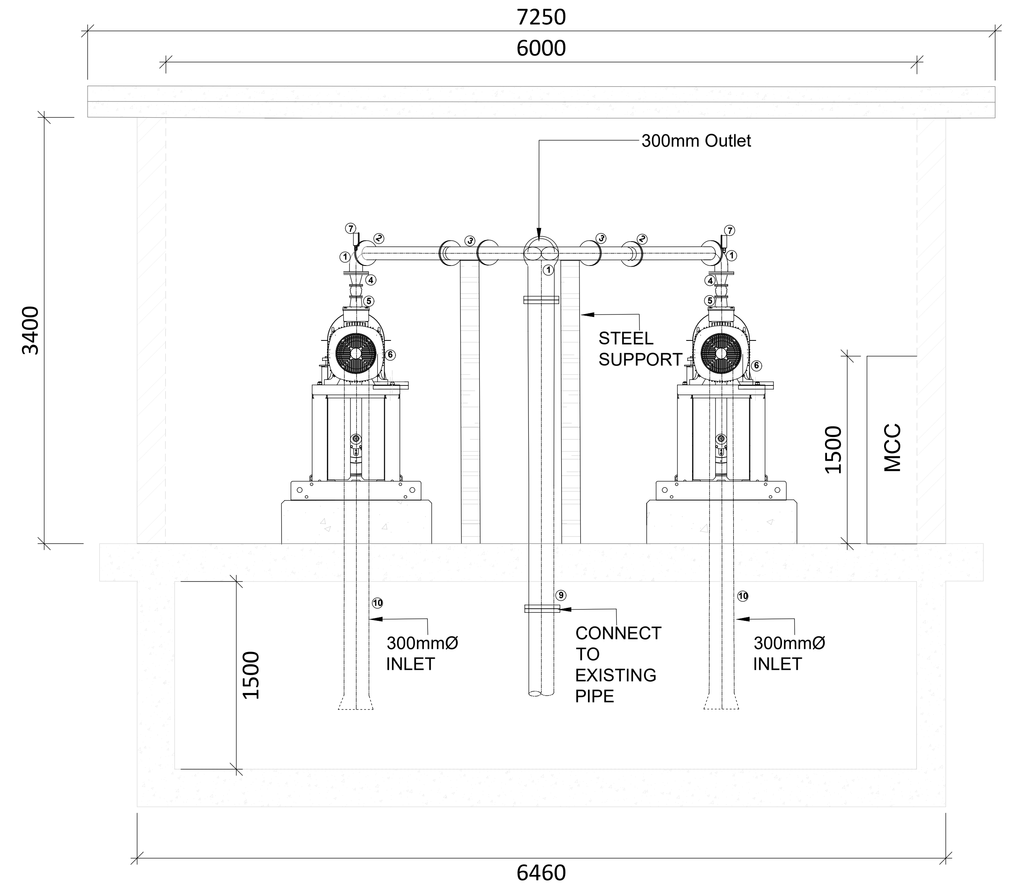
Drawing description

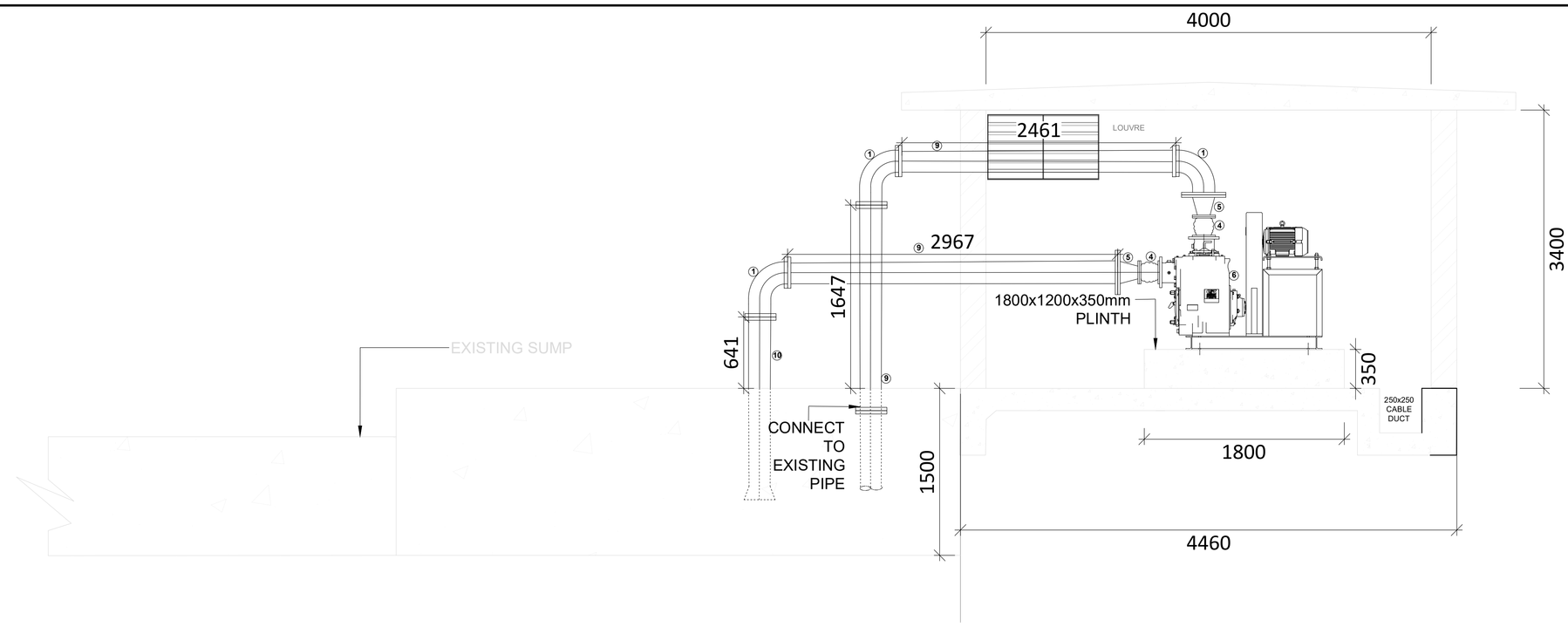
HOOF ACCESS ROAD LAYOUT (0,000km - 0,131km)

Drawn: **J RAMGHULAM**	Date: **SEPTEMBER 2025**
Scale(s): **AS SHOWN**	Sheet No.: **Sheet 1 OF 1**
Consultant Drawing number **V62-02-05-002-LAY-T-00**	Drawing Size **A0**
Client Drawing number	

PRELIMINARY DRAWING







TYPICAL STEEL PIPE FITTINGS AND ITEM LIST

ITEM N0.	DESCRIPTION	NO.	DIMENSIONS
1	315mm Ø x 45° LONG SEGMENTED BEND. BOTH ENDS FLANGED TO SABS 1123-1600/3	2	
2	FLANGED SWING CHECK VALVE WTH COUNTER WEIGHT PN16	2	
3	300mm Ø INDUSTRIAL PATTERN WEDGE GATE VALVE PN10- SANS 664 (NON RISING SPINDLE).	2	
4	200MM FLEXIBLE CONNECTOR	4	
5	300MM /200MM DIAMETER STEEL REDUCER ALL ENDS FLANGED TO SANS 1123 1600/3	4	300, 200, 280
6	SEWAGE SELF PRIMING PUMP, CORNELL MODEL 85TL-F-22 VANE-70MM SOLIDS DUTY 781/S@20.4M HEAD	2	
7	PRESSURE GAUGE	2	
8	STEEL Y-PIECE 45°, ENDS FLANGED TO SANS1123	1	
9	300mm Ø Steel Pipe flanged both ends to SANS 1123 / SABS 1600	4	
10	300mm Ø Suction Steel Pipe, flanged on one end and bellmouth on other end, fabricated from mild steel, epoxy coated	2	

FOR TENDER

NOTES

Revisions

REV. NO.	DATE	DESCRIPTION
00	SEPT.2025	ISSUED FOR CONSTRUCTION

Client Department Signatures:

Approved by:

Signature:

Checked by Professional Consultant:

E. BOSCH

Signature

SEPT.2025

Date

PROJECT MANAGERS & ENGINEERS
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DR PIXLEY
LOCAL MUNICIPALITY

Contract:

REFURBISHMENT OF HOOF SEWER PUMP STATION

Drawing description:

HOOF PUMP STATION LAYOUT (MECHANICAL)

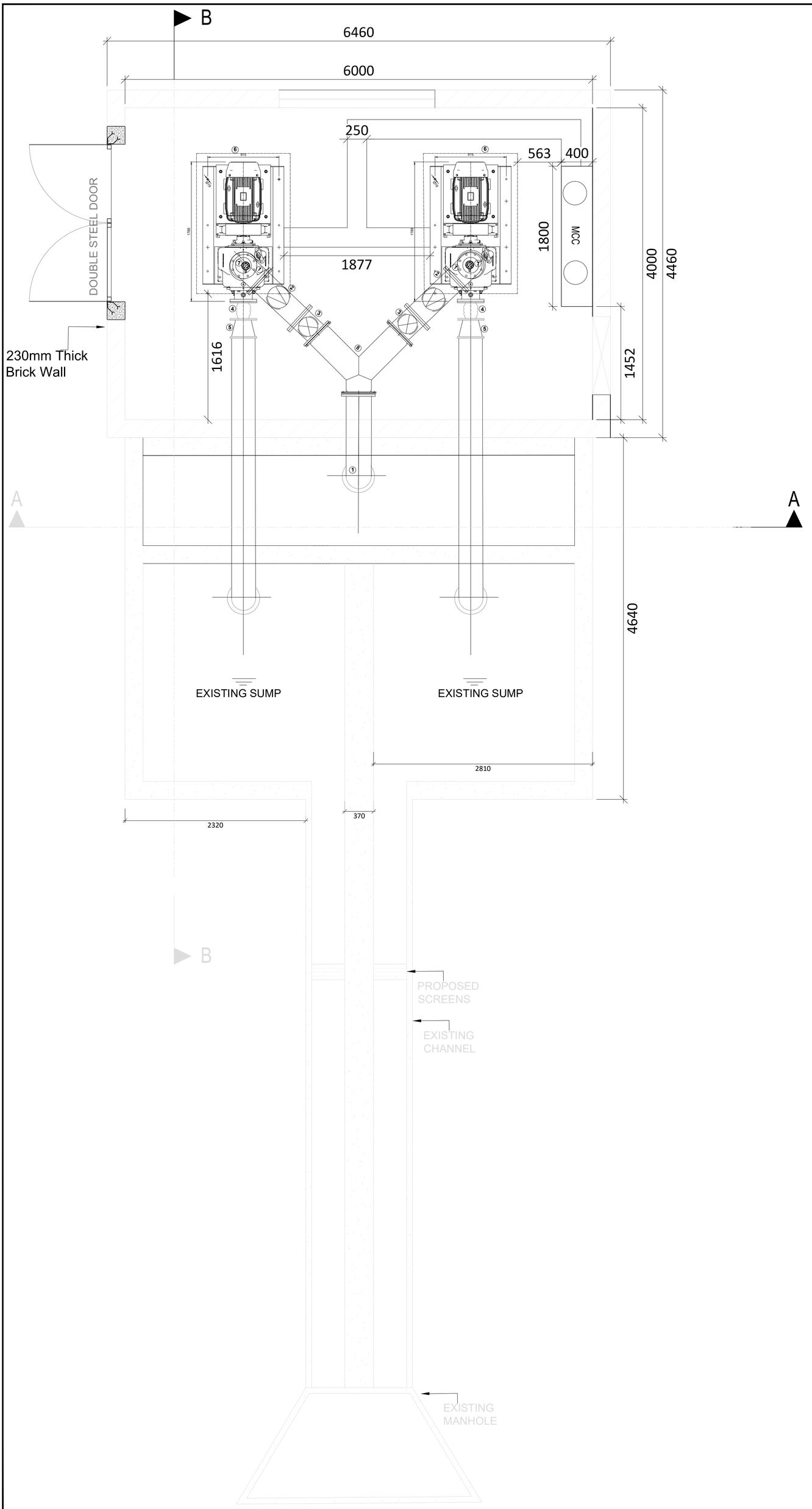
Drawn: ZULU LLP **Date:** SEPT.2025

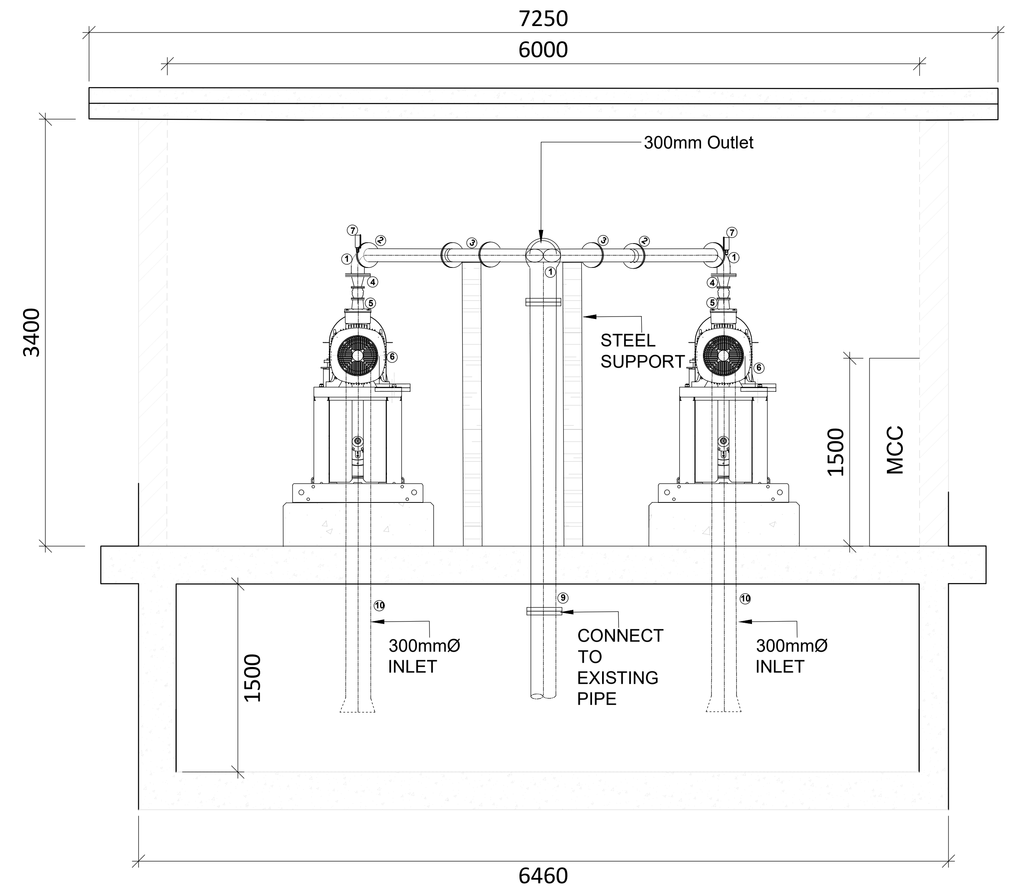
Scale(s): AS SHOWN

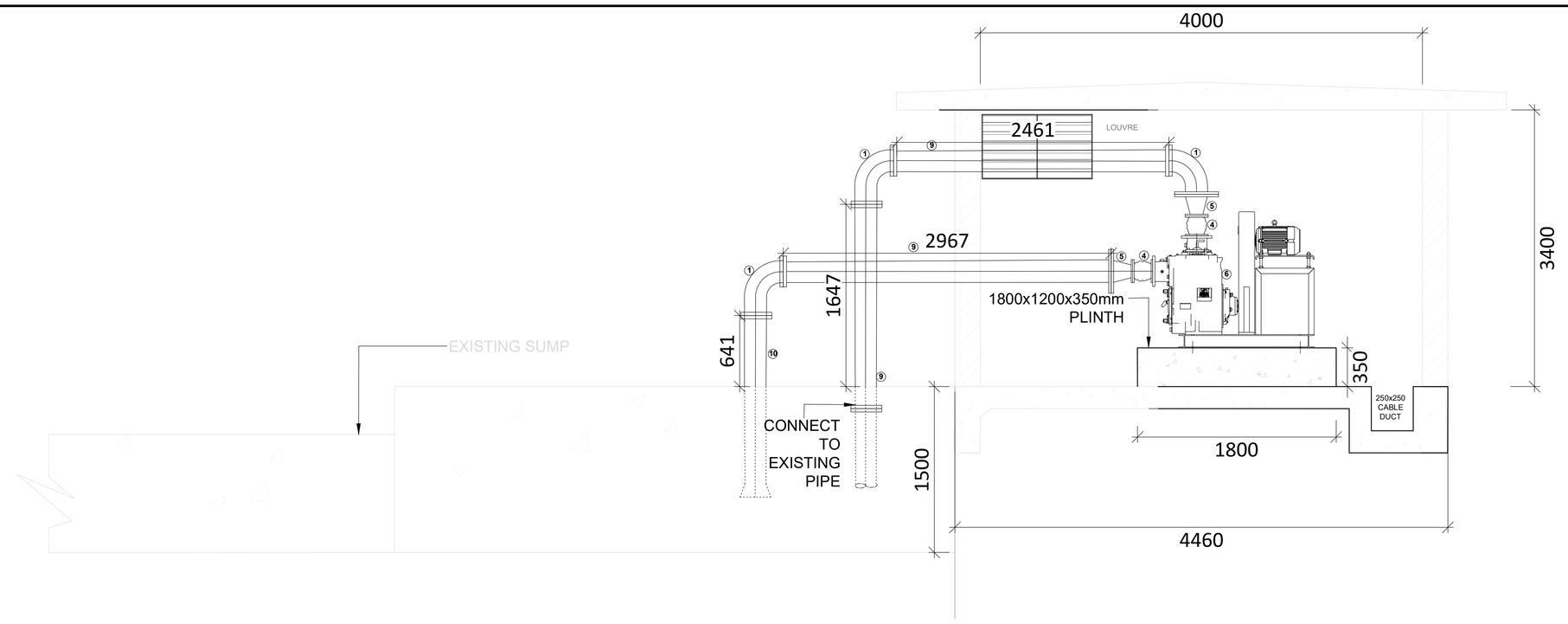
Consultant Drawing number:

V62-02-04-003-PS-T-00

Client Drawing number:







TYPICAL STEEL PIPE FITTINGS AND ITEM LIST

ITEM N0.	DESCRIPTION	NO.	DIMENSIONS
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3	300mm Ø INDUSTRIAL PATTERN WEDGE GATE VALVE PN10- SANS 664 (NON RISING SPINDLE).	2	
4	200MM FLEXIBLE CONNECTOR	4	
5	300MM /200MM DIAMETER STEEL REDUCER ALL ENDS FLANGED TO SANS 1123 1600/3	4	300 200 280
6	SEWAGE SELF PRIMING PUMP, CORNELL MODEL 85TL-F-22 VANE-70MM SOLIDS DUTY 781/S@20.4M HEAD	2	
7	PRESSURE GAUGE	2	
8	STEEL Y-PIECE 45°, ENDS FLANGED TO SANS1123	1	
9	300mm Ø Steel Pipe flanged both ends to SANS 1123 / SABS 1600	4	
10	300mm Ø Suction Steel Pipe, flanged on one end and bellmouth on other end, fabricated from mild steel, epoxy coated	2	

FOR TENDER

NOTES

Revisions

REV. NO.	DATE	DESCRIPTION
00	SEPT.2025	ISSUED FOR CONSTRUCTION

Client Department Signatures:

Approved by:

Signature:

Checked by Professional Consultant:

E. BOSCH

Signature

SEPT.2025

Date

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DR PIXLEY
LOCAL MUNICIPALITY

Contract:

REFURBISHMENT OF HOOF SEWER PUMP STATION

Drawing description:

HOOF PUMP STATION LAYOUT (CIVIL WORKS)

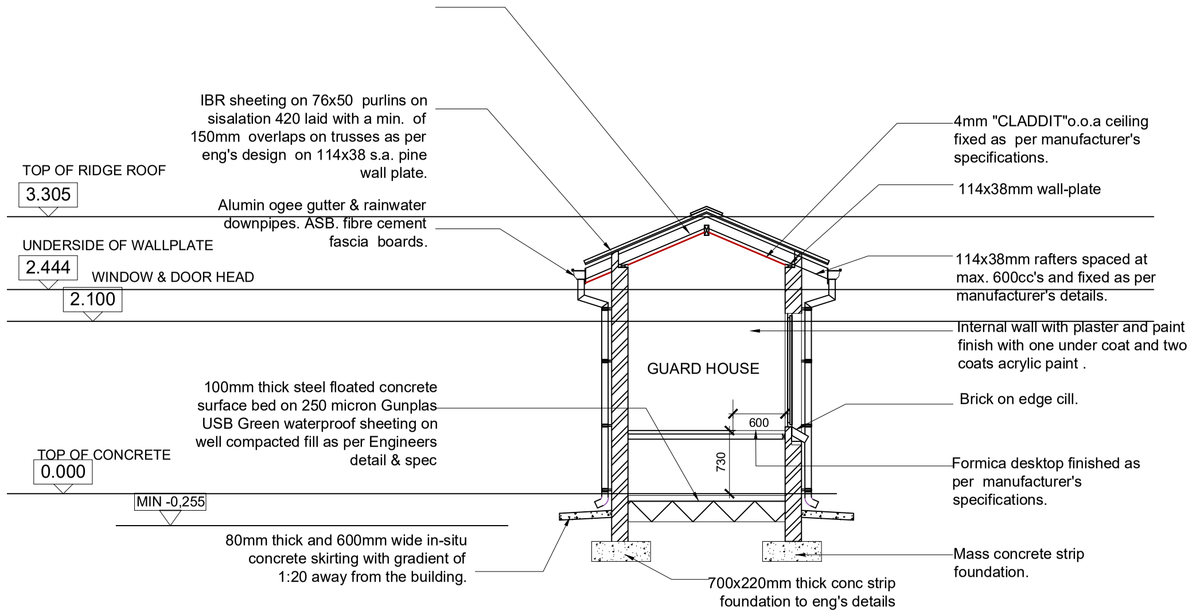
Drawn: ZULU LLP **Date:** SEPT.2025

Scale(s): AS SHOWN

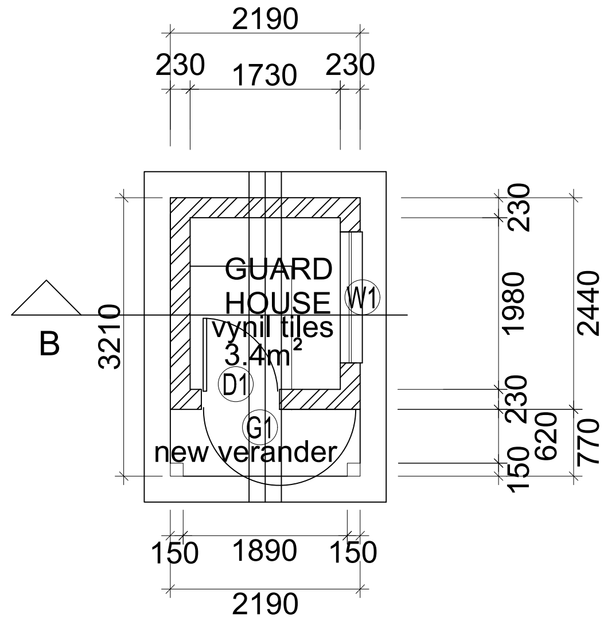
Consultant Drawing number:

V62-02-04-004-PS-T-00

Client Drawing number:

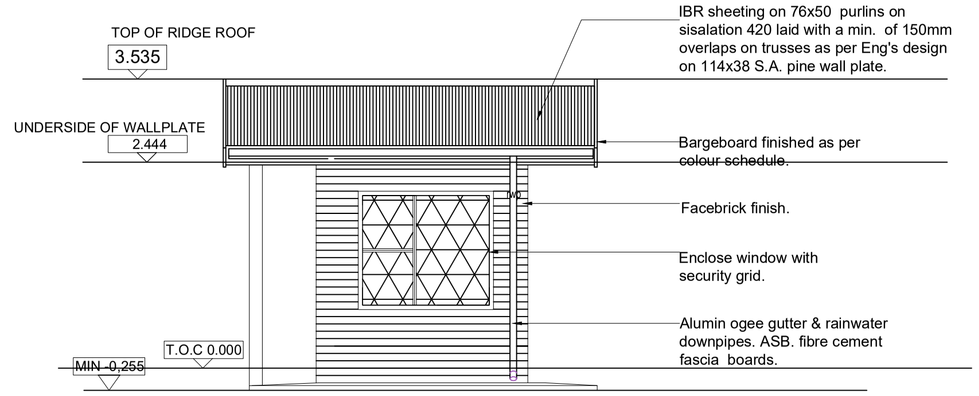


SECTION A-A SCALE 1:50

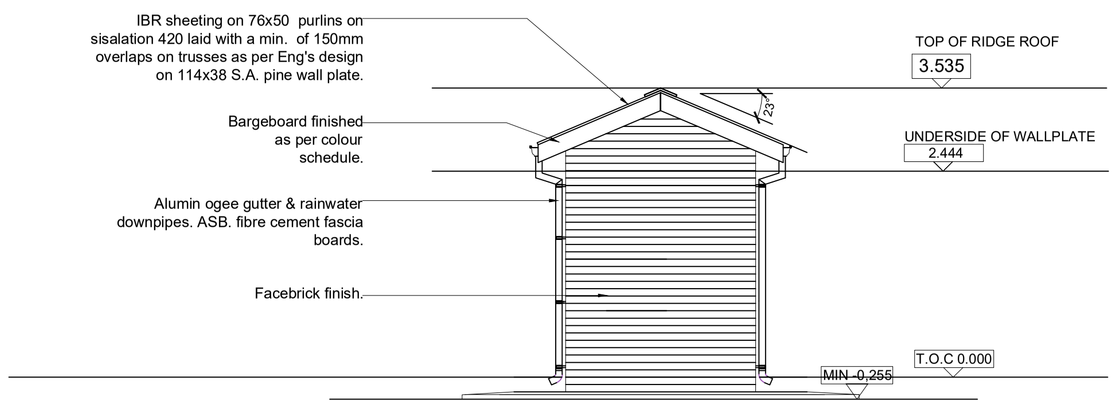


GROUND PLAN SCALE 1:50

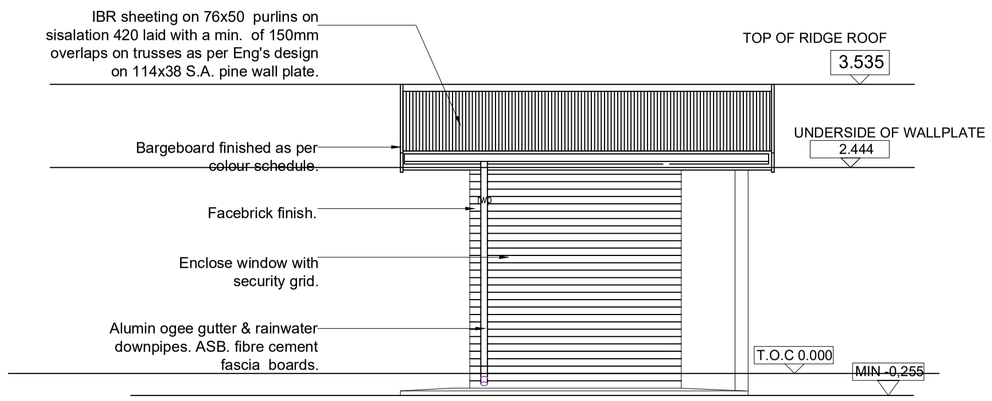
FRONT ELEVATION SCALE 1:50



SIDE ELEVATION



BACK ELEVATION SCALE 1:50



SIDE ELEVATION SCALE 1:50

NOTES

Revisions

REV. NO.	DATE	DESCRIPTION

Checked by Professional Consultant

Signature Date

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DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

Contract

REFURBISHMENT OF HOOF AND BETA METAL PUMP STATION WARD 03

Drawing description

GUARD HOUSE PLANS, SECTIONS & ELEVATION (NO ABLUTION)

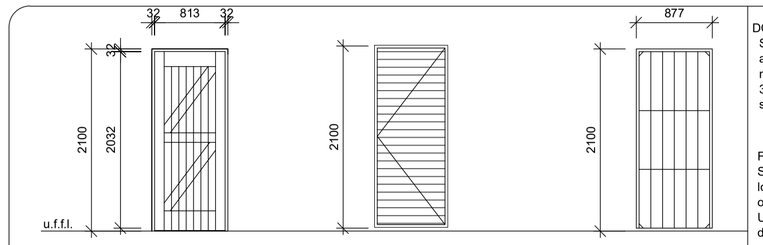
Drawn: A NGWENYA Date: 09- 2025

Scale(s): AS SHOWN

Consultant Drawing number

V62-02-04-005-GHPSE-T-00

Client Drawing number



DOOR SET 2:
SOLID ART 294 WC anodised aluminium mortice indicator bolt 38mm diameter door stop screwed to wall

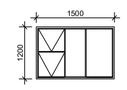
FOR DISABLED
Solid paraplegic lockset and handles on backplate
UNION ref AL5022-E14 disabled sign

TYPE:	D1	D2	G1 (1required)
FRAME:	Standard 1.2mm thick residential section double rebated frame.	900x2100 MILD STEEL FRAME	as per detail
F.FINISH:	Galvanised. Not painted.	Primed, undercoat and two coats gloss enamel.	Galvanised. Not painted.
DOOR:	2032x813x40mm SA Pine framed, ledged and braced battened door with 40 x 110mm stiles and top rail, 20 x 150mm middle ledge, 20 x 225mm bottom ledge and 20 x 110mm braces.	Solid Horizontal Slatted Meranti Door	gate as per detail
D.FINISH:	Primed, undercoat and two coats gloss enamel.	Primed, undercoat and two coats gloss enamel.	Galvanised. Not painted.
FURNITURE	DOOR SET 2. and 1 red rubber doorstop Applicable signage S1, S2, S3, to doors		see detail

STANDARD DOOR FRAME:
1.2mm galvanised pressed metal double rebated frame for 115mm walls complete with straps for building in.
2x100mm galvanised and welded loose-pin hinges, adjustable chrome striking plate and 2 rubber stops.

DS	SCALE:	DETAIL DESCRIPTION.
	1:50	DOOR AND GATE SCHEDULE

WINDOW SCHEDULE

	WO1	WO2
		
	No OFF REQUIRED: 1 LOCATION: MAIN HALL	No OFF REQUIRED: 1 LOCATION: MAIN HALL
CODE:	PTT 1512	PTT 66
FRAME:	1500x1200 ALUMINIUM WINDOW FRAME	590X590 ALUMINIUM WINDOW FRAME
GLAZING:	6.38mm LAMINATED SAFETY GLASS	6.38mm LAMINATED SAFETY GLASS
FINISHES:	POWDER COATED CASEMENT WINDOW UNITS AS PER APPROVED SYSTEM	POWDER COATED CASEMENT WINDOW UNITS AS PER APPROVED SYSTEM

GENERAL SPECIFICATION NOTES:
This specified drawing to be read in conjunction with the WB20 Standard Preambles.

All TRADE NAMES to be as specified or equal and approved.
ROOF:
Marley Double Roman Standard Slate concrete roof tiles size 332 x 420mm laid in straight bond at a pitch of 17.5º with a minimum head lap of 100mm, fixed with non-corrodible tile nails and/or clips (fixing category C : Each tile) to and including 38 x 38mm sawn softwood battens with galvanised clout nails at 320mm centres on SABS approved underlay with 150mm overlapped joints fixed over trusses and under tiling battens, all fixed to

Prefabricated cleated roof trusses to be to the Engineer's approval - or trusses to be manufactured on site are to be constructed to details as shown of roof plan.
Roof is to be tied down to walls with 30mm x 1.6mm thick and 1.6m long galvanised hoop iron straps built in.
Trusses to be spaced at +/- 760mm(max) c/c (as dimensioned on roof plan) resting on 114 x 38 wall plates.
HURRICANE CLIPS to be used at eaves overhangs.
At all other intersections double wound 2.5mm dia. galv. wire.
All exposed roof timber to be painted with 2 coats ABE PROVONITE, before fixing of roofing sheets, fascias and barge-boards.

Roof pitch to be 17.5 degrees

BARGEBOARD:
EVERITE NUTEC fibre-cement sockettess bargeboards (Product No 521-731) 200mm x 80mm.

Aluminium H-profile barge-board joiners (Product No 685-187). Drill for and fix with hot-dipped galvanised screws and washers. 76 x 50mm trimmer batten fixed underside of purlin ends for barge-board fixing.

WINDOWS:
Hot dipped galvanised " SS Industrial Type " metal windows.
No painting required.
4mm clear glazing with steel putty. No painting necessary.
Refer to window schedule.

DOORS:
Galvanised Stock Steel Single Rebated door frames (1.2mm thick) for 115mm brick walls - not painted with 1 pair of 100mm galvanised steel loose-pin hinges welded in position.
2032 x 813 x 40mm SA Pine framed, braced and ledged battened doors with SOLID ART 294 mortice indicator bolt.
All doors to be primed, undercoat and 2 coats - gloss enamel.

FASCIAS:
EVERITE NUTEC medium density fibre-cement fascia boards (Product no. 041-505),
15mm thick x 225mm with aluminium H-profile fascia joiners (Product no. 685-195). Drill for and fix with hot-dip galvanised drive screws and washers.

CEILINGS:
Ceiling formed of 6mm Everite Nutec plain boards fixed to and including 38 x 38mm sawn softwood brandering at 350mm centres (max) with cross brandering at joints, ends of sheets, cornices and light fittings, at 150mm centers with white PVC H-profile jointing strips over joints with all nail or screw heads stopped and sanded level and fixed to trusses.

FOUNDATIONS:
700 x 230 (25mPa) concrete strip footings under all walls with top of foundation to sit in natural ground with a minimum of 400mm below ground level and to Architect's/Engineer's approval.

GSN	DETAIL DESCRIPTION.
	GENERAL SPECIFICATION NOTES

WALLS:
SABS approved facebicks to comply with SABS 1215.
Brickforce to be built in every 5th course from slab level up.
In walls with door/window openings, brickforce is to be used at every course up.
Facebrick roller-course above all door & window openings.
All walls are to comply with "Part K" of the National Building Regulations.
Walls to be plastered internally and externally 13 - 16mm thick.
Internal plaster is to be 1:5 cement:sand mix.
Facebrick on edge cills at 30 degree slope.
Provide 350 micron and 250mm wide GUNPLAS DPC under surfacebeds.
Walls to be painted with "WALL 'n ALL" emulsion paint internally.
1200mm high Dado (internal) to be painted a darker colour. All colours to be approved by the Architect.
Beam filling to underside of roofing sheets.
Control joints to be provided at every 12m c/c., as per Engineer's details. Sealed with polysulphide sealant on backing strips and softboard insert.

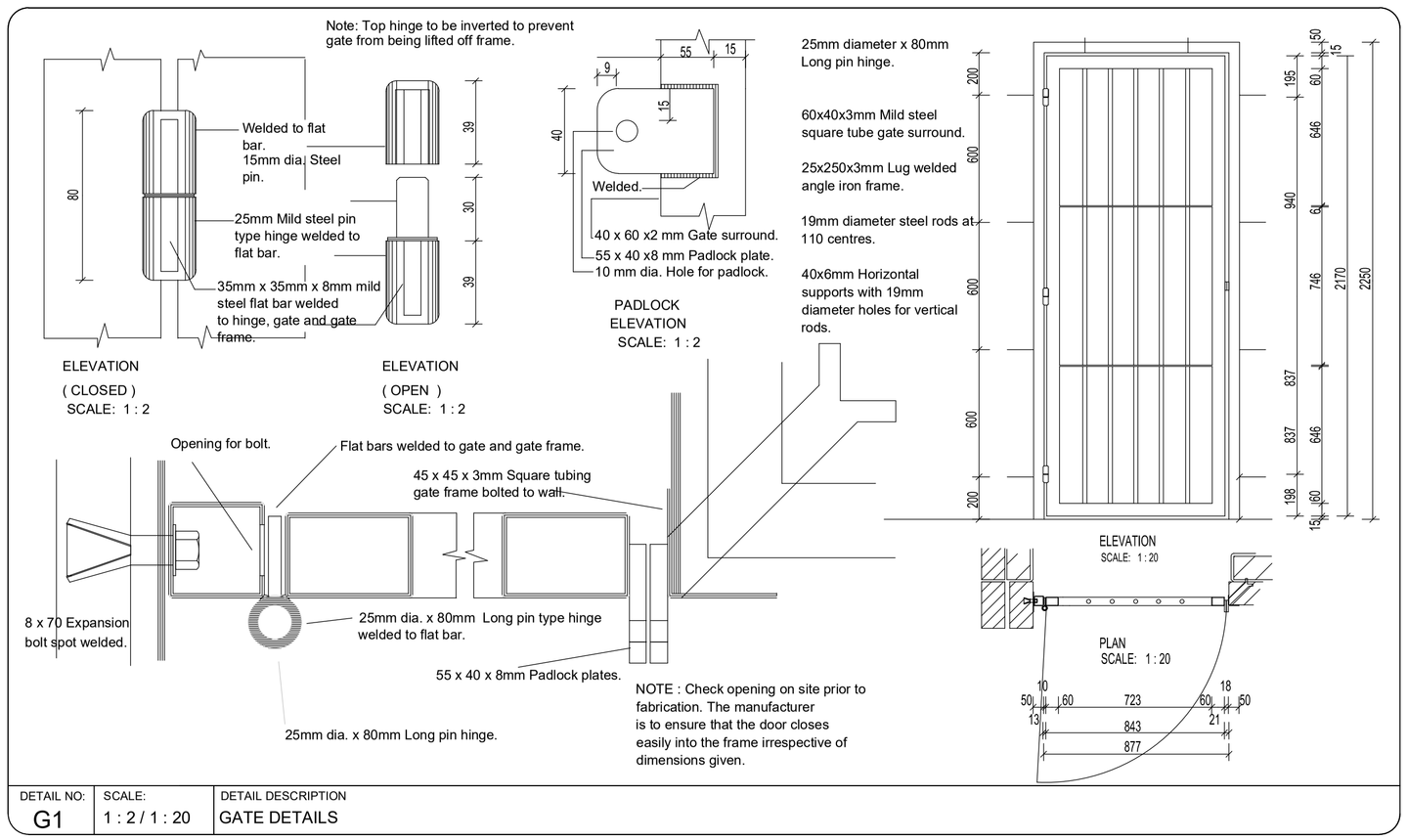
FLOORS:
100mm thick power floated finished concrete slab (25Mpa) reinforced with mesh Ref 193 set 25mm below top on 250 microns GUNPLAS USB GREEN damp-proofing membrane on 25mm riversand bed on fill compacted to MOD AASHTO 95%.
Soil to be poisoned in accordance with SABS 1165.
(Certificate must be provided)

VERANDAH WALKWAY:
100mm thick concrete slab (25Mpa) reinforced with mesh Ref 193 set 25mm below top on 250 microns GUNPLAS USB GREEN dampproofing membrane on 25mm riversand bed on fill compacted to MOD AASHTO 95%. Verandah floor to be graded to fall 50mm and cast in panels at 1850 centres. Control Joints at every 7.4m centres, as per Engineer's detail. Finish to be wood float non-slip. Control joints sealed with Polysulphide sealant with backing strip and softboard.

CONCRETE APRONS / CHANNELS
Concrete aprons laid to a fall of 1:200 and in panels with control joints at every 2m centres on fill compacted to MOD AASHTO 95% as per Engineer's detail.
Control joints sealed with Polysulphide sealant with backing strip and softboard.

BACKFILL:
Filling to be approved clean earth, well watered and rammed in layers not exceeding 150mm in depth and thoroughly consolidated to a density of 95% MOD AASHTO, as per Engineer's detail.

GSN	DETAIL DESCRIPTION.
	GENERAL NOTES CONTINUED



DETAIL NO:	SCALE:	DETAIL DESCRIPTION
G1	1 : 2 / 1 : 20	GATE DETAILS

NOTES

Revisions

REV. NO.	DATE	DESCRIPTION

Checked by Professional Consultant

Signature Date

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DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

Contract
REFURBISHMENT OF HOOF SEWER PUMP STATION

Drawing description
DOORS, WINDOW, GATE SCHEDULE AND DETAILS

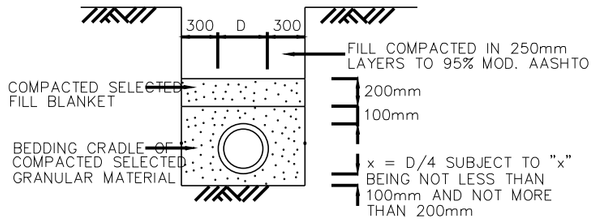
Drawn: A NGWENYA Date: 09- 2025

Scale(s): AS SHOWN

Consultant Drawing number
V62-02-03-006-DET-T-00

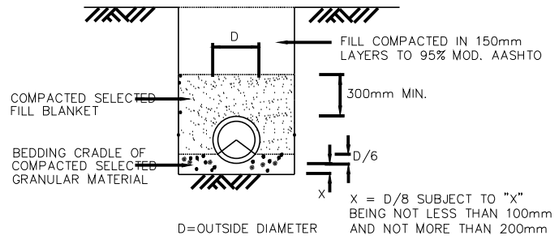
Client Drawing number

PIPE BEDDING DETAILS FOR RIGID AND FLEXIBLE SEWER PIPES



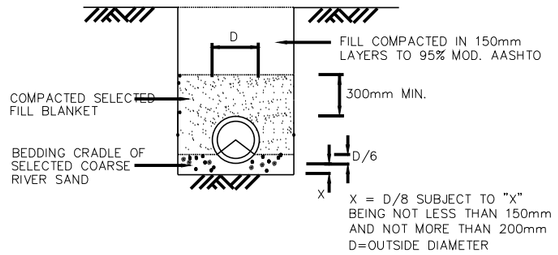
FLEXIBLE PIPE BEDDING

SCALE 1 : 10



RIGID PIPE BEDDING TYPE A

SCALE 1 : 10

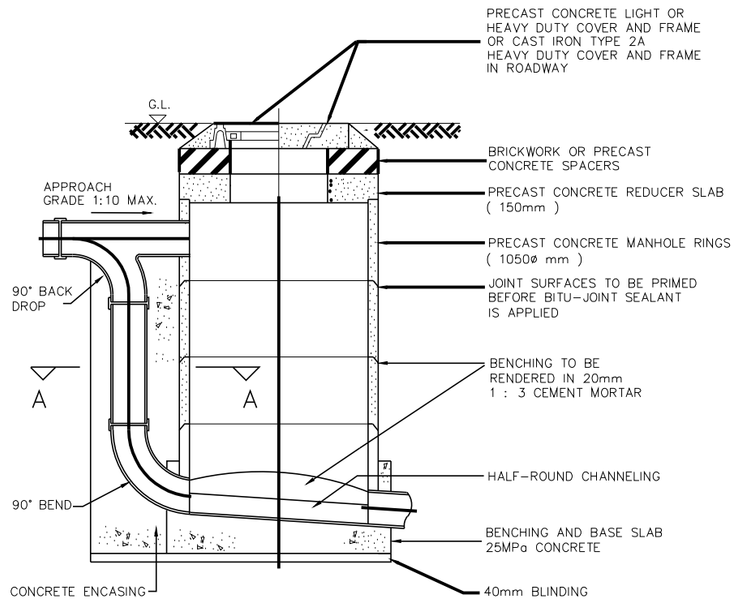


RIGID PIPE BEDDING TYPE B

SCALE 1 : 10

NOTES:
ALLOW 1/3 OF ALL SEWER BEDDING TO BE TYPE B BEDDING
REMAINING 2/3 OF SEWER BEDDING TO BE TYPE A BEDDING

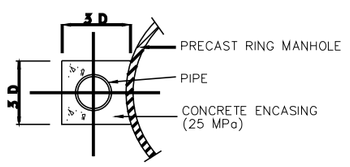
SEWERAGE – DROP INLET MANHOLE



TYPICAL SECTION

SCALE 1 : 25

● FOR DROPS GREATER THAN 1000mm.

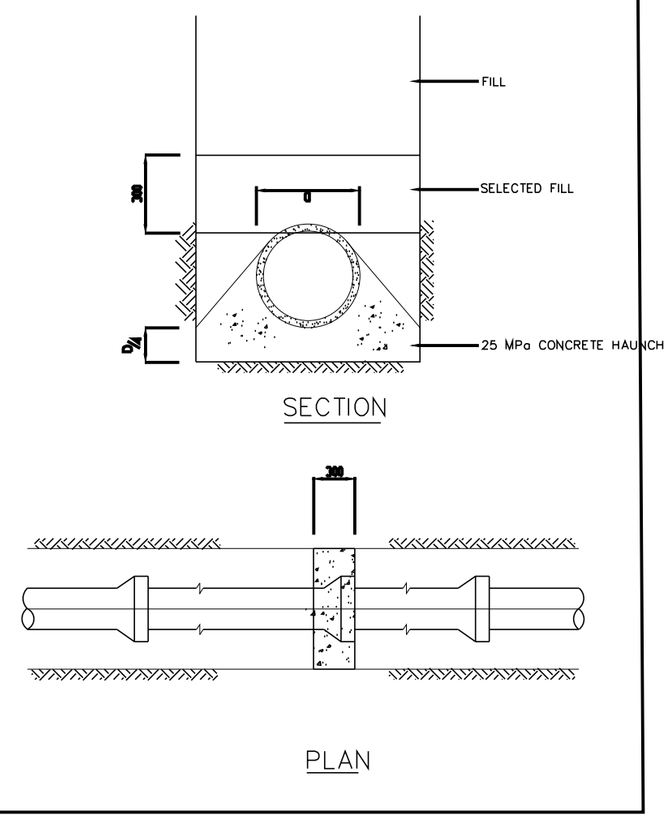


SECTION A–A

SCALE 1 : 25

● CONCRETE ENCASING 3 x ø OF PIPE

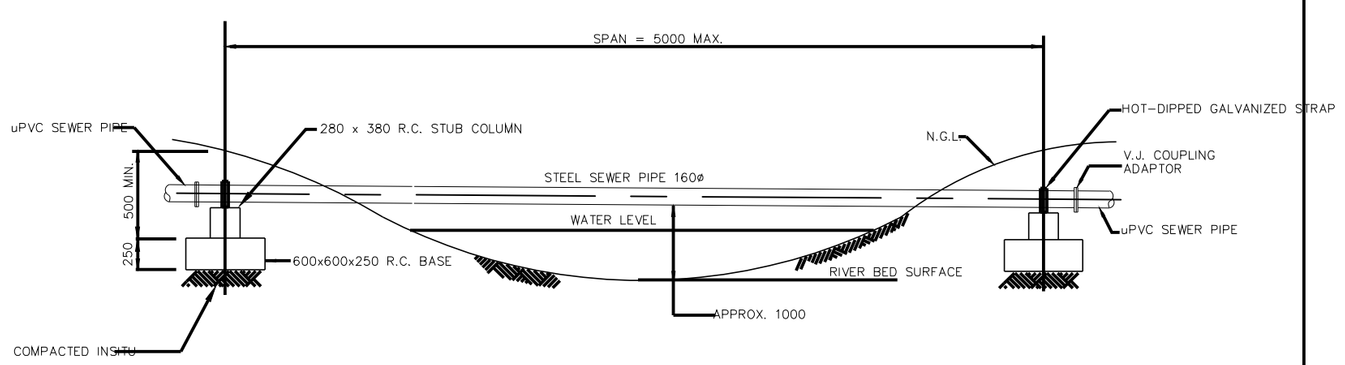
TYPICAL ANCHOR BLOCK DETAIL



SECTION

PLAN

TYPICAL PIPE BRIDGE



SECTION PIPE BRIDGE

SCALE 1 : 25

NOTES

a. LANDSCAPE AROUND ALL CHAMBERS, SO THAT FINISHED GROUND LEVEL IS 200mm BELOW TOP OF CHAMBER, 1m AROUND EACH CHAMBER, WHERE CHAMBERS ARE LOCATED IN ROADS, ROOF SLAB TO PROTRUDE MAX. 20mm ABOVE SURROUNDING ROAD.

b. VENTILATION TO BE FABRICATED FROM 3CR12 AND VENTILATOR TO BE CAST IN TOP SLAB.

c. MASS CONCRETE BASE REQUIRED IN WET AREAS.

d. STRUCTURAL CONCRETE TO BE CLASS 30/19.

e. ALL FITTINGS , FLANGES, ETC TO BE ORDERED TO THE FOLLOWING TABLE:
PN16 PIPES: SANS 1123, TABLE 1600/3
PN25 PIPES: ≤ 600 DNSANS 1123, TABLE 2500/3
> 600 DN SABS 4504

f. ALL MILD STEEL PIPES AND FITTINGS SHOULD BE HOT-DIPPED GALVANIZED.

g. ALL PIPES AND FITTINGS SHALL BE SUPPLIED COMPLETE WITH COUPLINGS AND JOINTING MATERIAL.

h. BRICKS SHALL BE OBTAINED FROM THE APPROVED MANUFACTURER AND THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE SAMPLES OF BRICKS HE INTENDS TO USING IN THE CONSTRUCTION OF WORKS.

i. CONCRETE SHALL COMPLY WITH REQUIREMENTS OF SABS 1200G/ 1200GA.

j. ALL FITTINGS DIMENSIONS TO BE CONFIRMED ON SITE BEFORE FABRICATION.

REVISIONS

REV. NO.	DATE	DESCRIPTION
00	30/06/2025	ISSUED FOR CONSTRUCTION

CLIENT DEPARTMENT SIGNATURES

APPROVED BY

SIGNATURE

Checked by Professional Consultant

A MANGRAY

Signature

SEP. 2024
Date

Consultant

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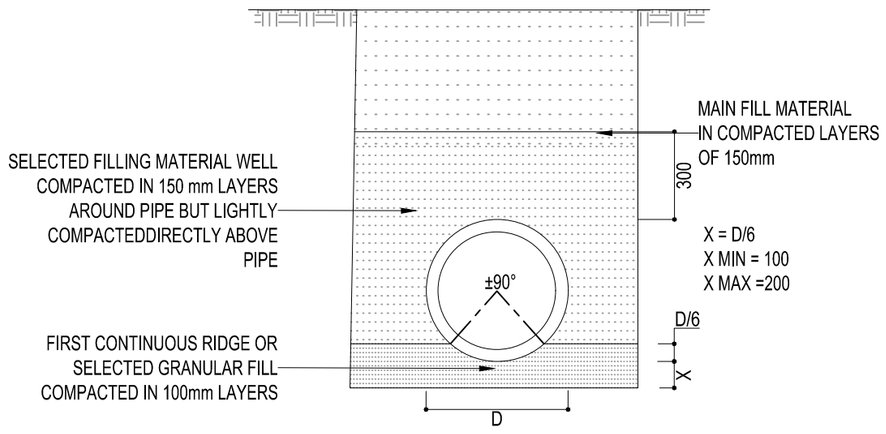
Contract

REFURBISHMENT OF HOOF SEWER PUMP STATION

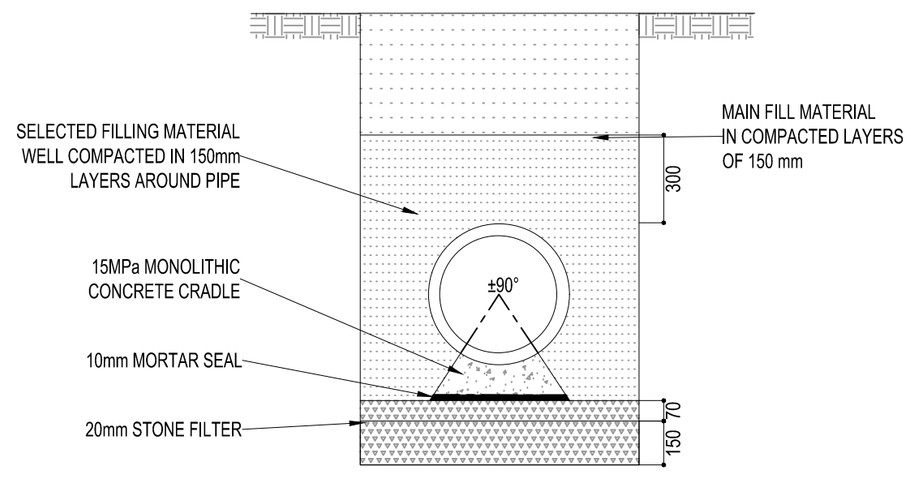
Drawing description

STANDARD SEWER DETAILS

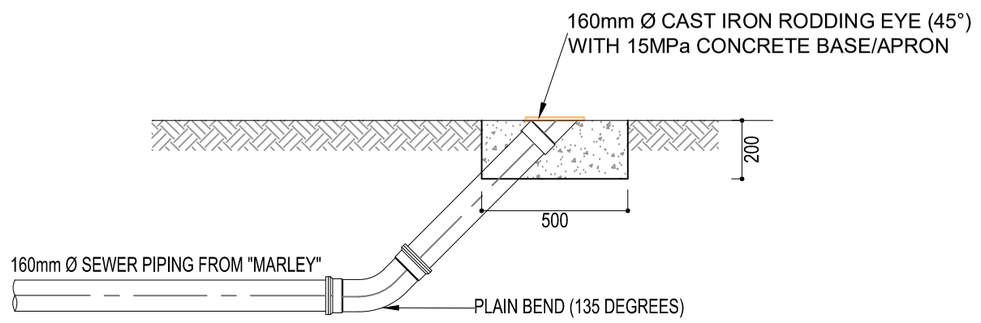
Drawn: K SAHADEO	Date: SEP.2024
Scale(s): AS SHOWN	Sheet No.: SHEET 1 OF 1
Consultant Drawing number V62-02-03-008-DET-T-00	Drawing Size.: A1
Client Drawing number	



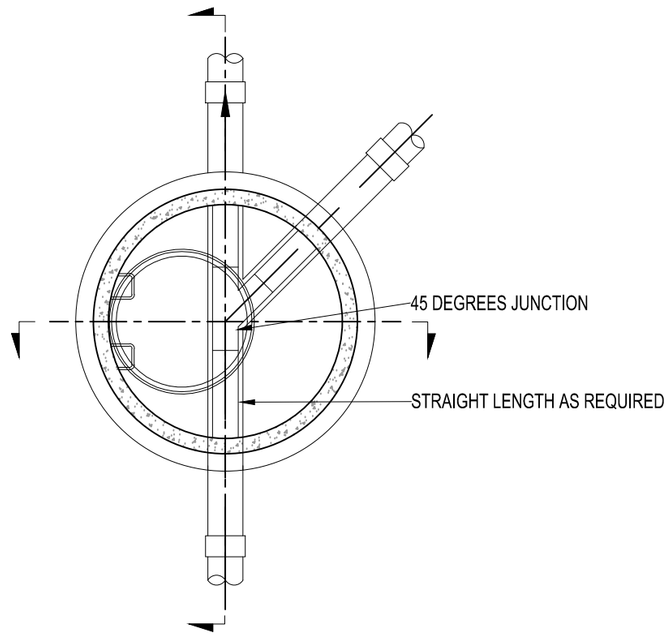
BEDDING TYPE C - NON-FLEXIBLE PIPES
SCALE 1:20



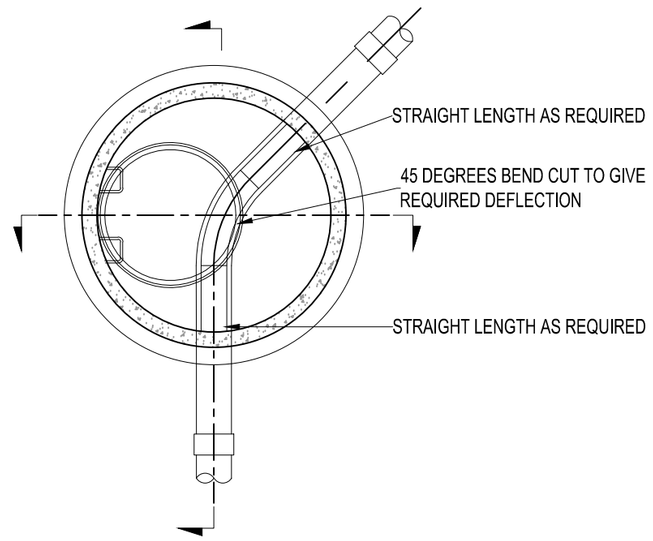
TYPICAL BEDDING IN WATERLOGGED AREAS
SCALE 1:20



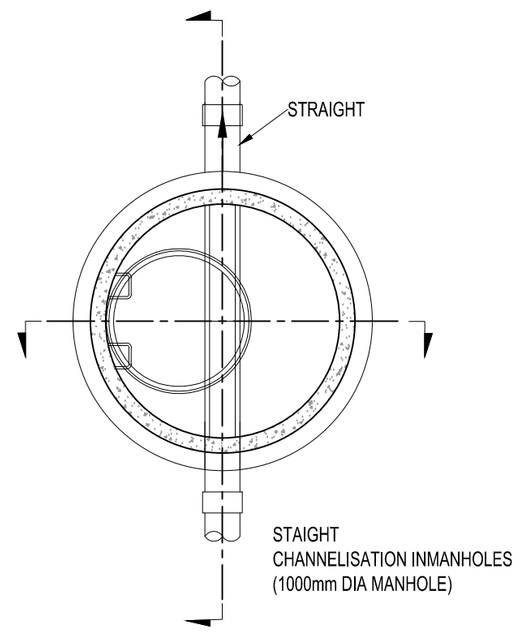
TYPICAL RODDING EYE DETAILS
SCALE 1:20



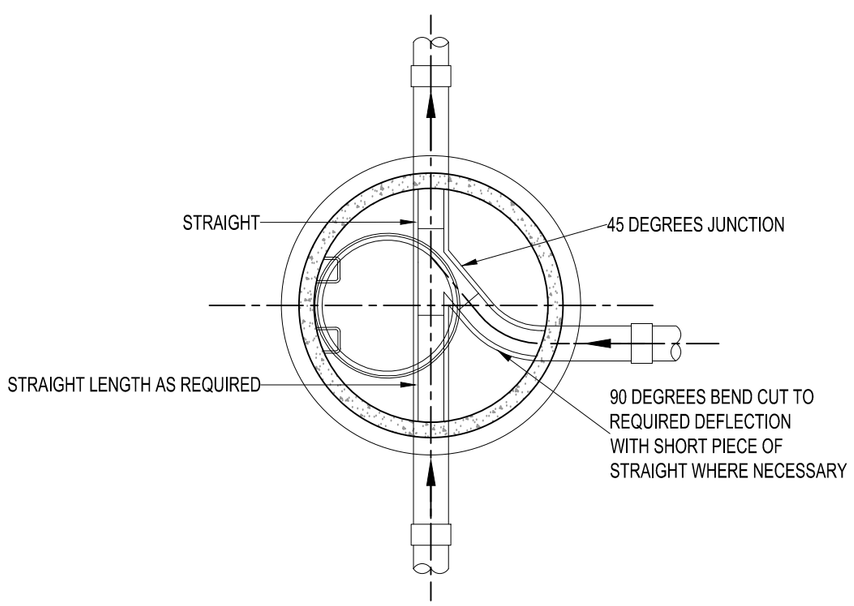
45° JUNCTION CHANNELISATION IN MANHOLES (1000mm DIA. MANHOLE)
SCALE 1:25



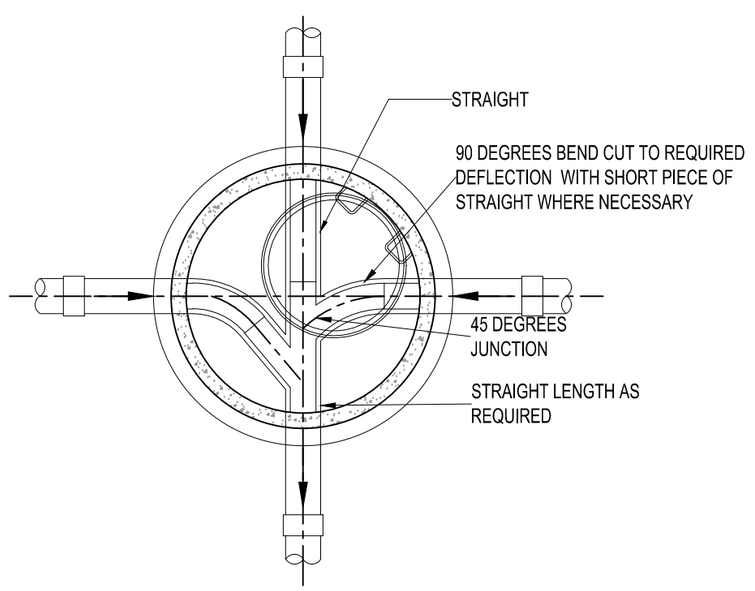
0° TO 90° CHANNELISATION IN MANHOLES (1000mm DIA. MANHOLE)
SCALE 1:25



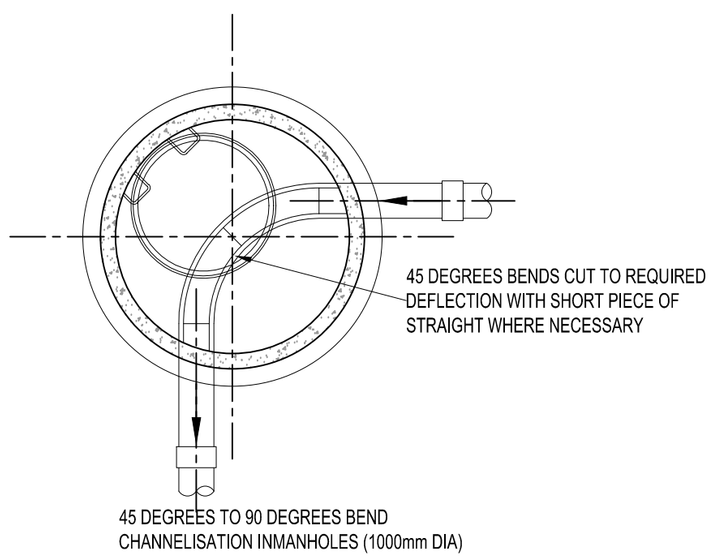
STRAIGHT CHANNELISATION IN MANHOLES (1000mm DIA. MANHOLE)
SCALE 1:25



45° TO 90° JUNCTION CHANNELISATION IN MANHOLES (1000mm DIA. MANHOLE)
SCALE 1:25



2 & 3 JUNCTION CHANNELISATION IN MANHOLES (1000mm DIA. MANHOLE)
SCALE 1:25



45° TO 90° JUNCTION CHANNELISATION IN MANHOLES (1000mm DIA. MANHOLE)
SCALE 1:25

NOTES

Revisions

REV. NO.	DATE	DESCRIPTION

Checked by Professional Consultant: SM
Signature
09-2025
Date

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DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

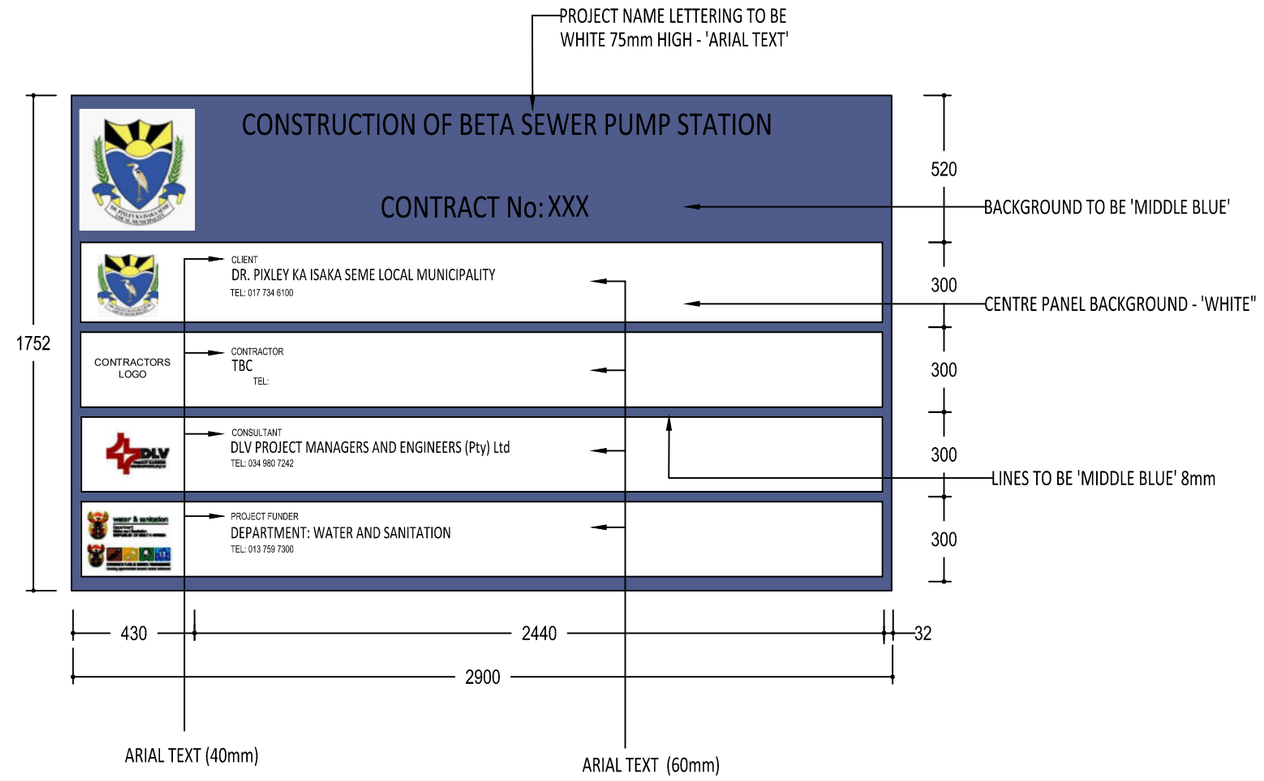
Contract

REFURBISHMENT OF HOOF SEWER PUMP STATION

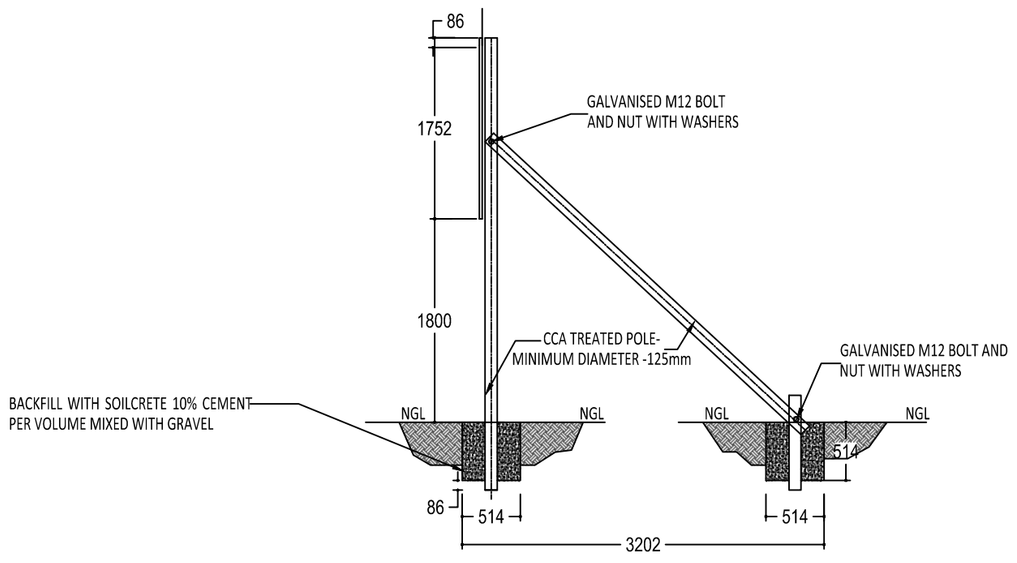
Drawing description

SEWER PIPE TRENCH BEDDING AND PIPE CHANNELISATION DETAILS

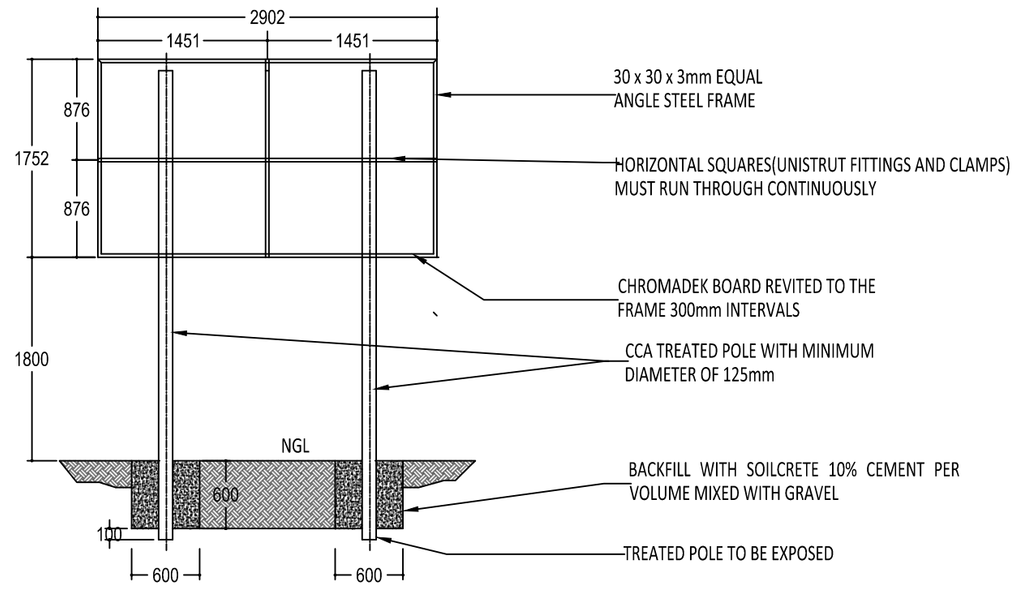
Drawn: A NGWENYA
Date: 09- 2025
Scale(s): AS SHOWN
Consultant Drawing number: V62-02-03-009-PBPCDET-T-00
Client Drawing number



NAME BOARD
SCALE 1:20



SIDE VIEW
SCALE 1:50



FRONT VIEW
SCALE 1:50

LEGENDS

a. COLOURS IN ACCORDANCE WITH SANS 1091 : 2004
   B11: DARK EARTH
   F07: MIDDLE BLUE
   G04: BLUE GREY
   G80: CLOUD WHITE

b. SUPPORTS TO BE CCA TREATED POLES WITH A MINIMUM DIAMETER OF 125mm.

c. SOILCRETE BACKFILL TO BE WELL COMPACTED.

d. UNISTRUT FITTINGS AND CLAMPS TO BE USED.

e. ALL DIMENSIONS IN MILLIMETERS (mm) UNLESS STATED OTHERWISE.

Revisions

REV. NO.	DATE	DESCRIPTION

Checked by Professional Consultant: SM

Signature: 06-2025 Date

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DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

Contract
CONSTRUCTION OF HOOF SEWER PUMP STATION

Drawing description
PROJECT SIGNBOARD

Drawn: ZULU LLP Date: 06- 2025

Scale(s): AS SHOWN

Consultant Drawing number
V62-02-03-010-SB-C-00

Client Drawing number



BETA PUMP STATION LAYOUT

SCALE 1:250

PRELIMINARY DRAWING

NOTES

REV. NO.	DATE	DESCRIPTION

CLIENT DEPARTMENT SIGNATURES

APPROVED BY

SIGNATURE

Checked by Professional Consultant

Signature: Date:

Consultant

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Project

REFURBISHMENT OF BETA SEWER PUMP STATION

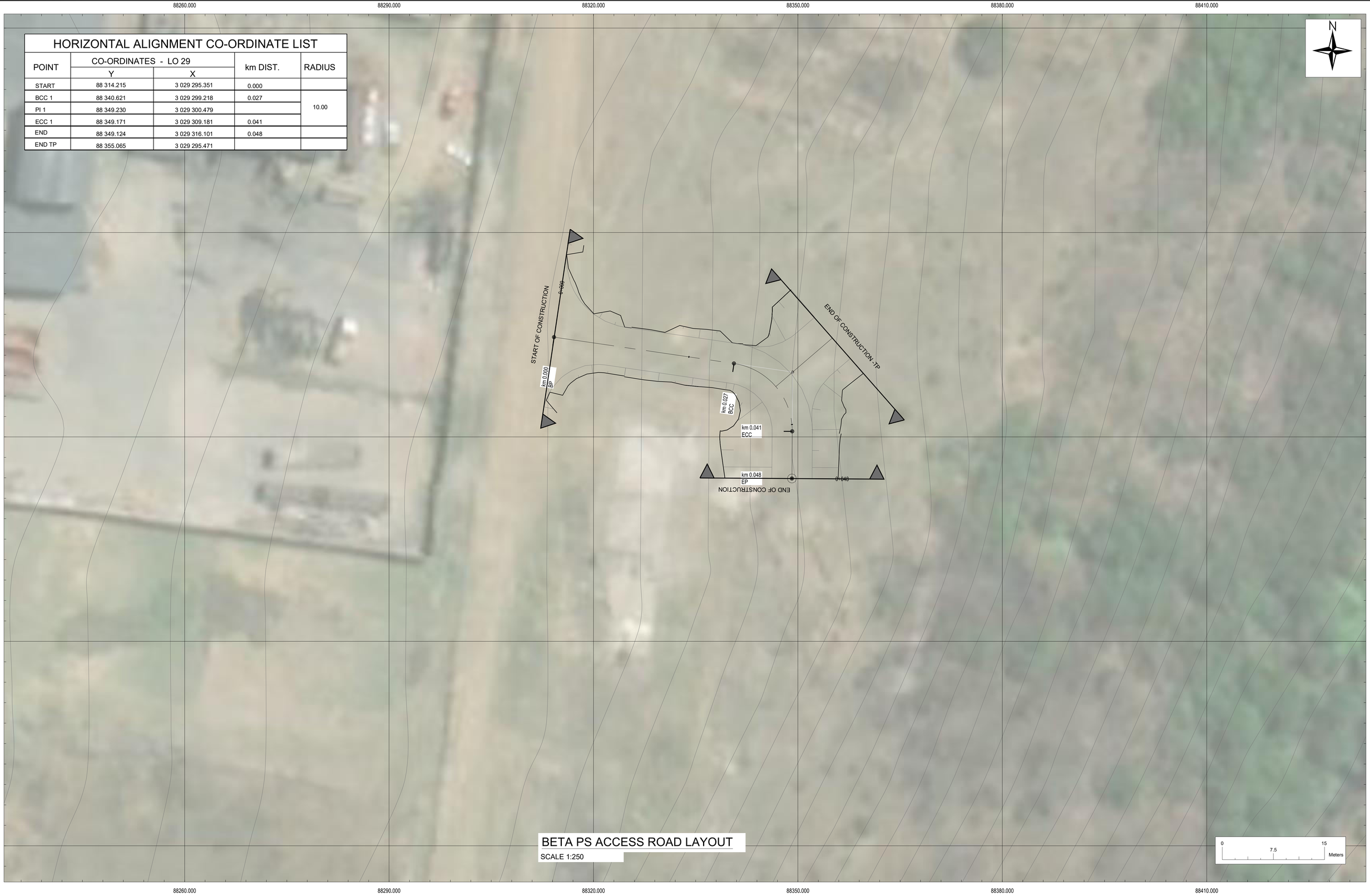
Drawing description

LOCALITY PLAN

Drawn:	Date:
ZULU LLP	**SEPTEMBER 2025**
Scale(s):	Sheet No.:
AS SHOWN	**Sheet 1 OF 1**
Consultant Drawing number	Drawing Size
V62-02-03-001-LP-T-00	**A0**
Client Drawing number	

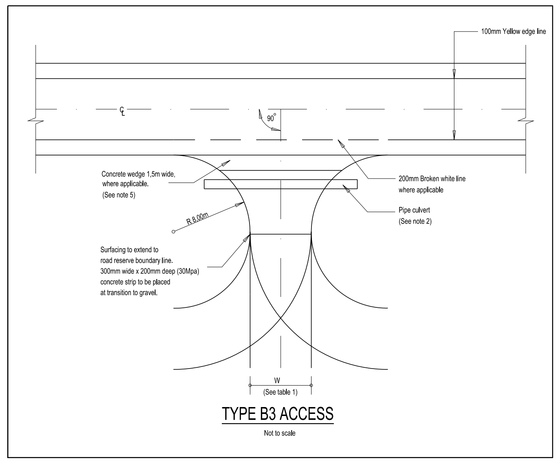
HORIZONTAL ALIGNMENT CO-ORDINATE LIST

POINT	CO-ORDINATES - LO 29		km DIST.	RADIUS
	Y	X		
START	88 314.215	3 029 295.351	0.000	
BCC 1	88 340.621	3 029 299.218	0.027	10.00
PI 1	88 349.230	3 029 300.479		
ECC 1	88 349.171	3 029 309.181	0.041	
END	88 349.124	3 029 316.101	0.048	
END TP	88 355.065	3 029 295.471		



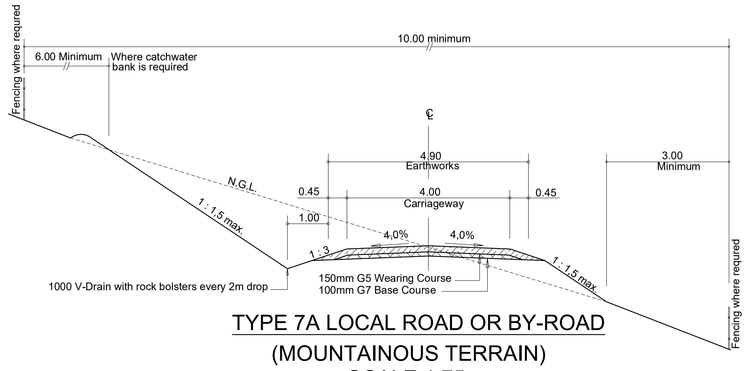
BETA PS ACCESS ROAD LAYOUT

SCALE 1:250



TYPE B3 ACCESS

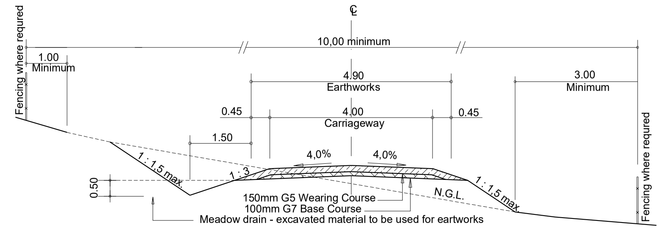
Not to scale



TYPE 7A LOCAL ROAD OR BY-ROAD

(MOUNTAINOUS TERRAIN)

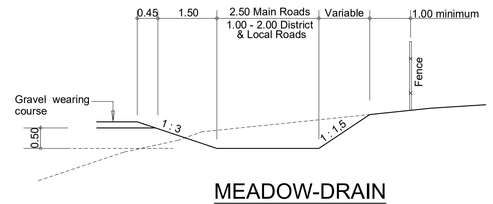
SCALE 1:75



TYPE 7A LOCAL ROAD OR BY-ROAD

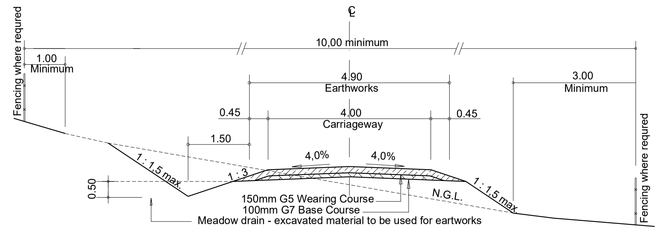
(ROLLING TERRAIN)

SCALE 1:75



MEADOW-DRAIN

SCALE 1:75



TYPE 7A LOCAL ROAD OR BY-ROAD

(ROLLING TERRAIN)

SCALE 1:75

MATERIAL LEGEND

Soil Survey Sample Pits — SP1

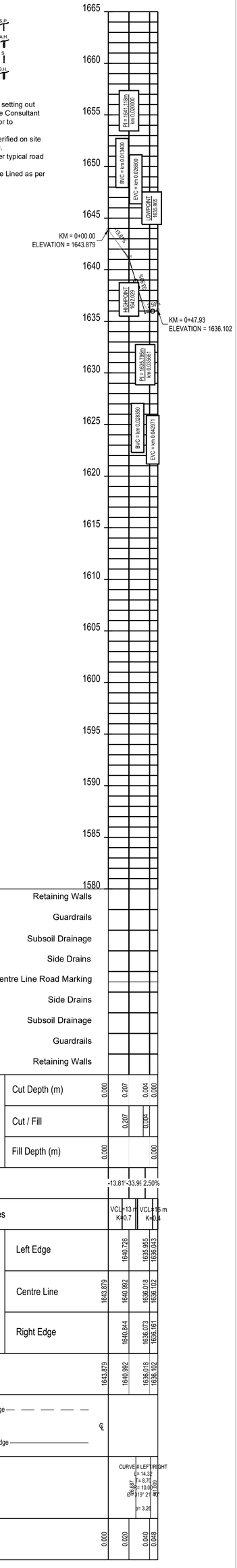
Soil Survey Auger Holes — A+1

Seismic Probes — S

Boreholes — B+1

NOTES:

1. All levels, dimensions and setting out details to be verified by the Consultant and Contractor on site prior to construction.
2. All roadmarking is to be verified on site according to the SARTSM.
3. Pavement layerance as per typical road sections detail.
4. All V-drains to be Concrete Lined as per Typical Section



Earthworks Quantities	Cut Depth (m)	0.000	0.207	0.004 0.000
	Cut / Fill		0.207	0.004
	Fill Depth (m)	0.000		0.000
Vertical Alignment	Grades %		-13.81°	-33.9° 2.50%
	Vertical Curves		VCL=13 m K=0.7	VCL=15 m K=0.6
Final Road Levels	Left Edge		1640.726	1636.665 1636.423
	Centre Line		1643.879	1640.992 1636.618 1636.102
	Right Edge		1640.844	1640.073 1636.611
C/L Ground Levels		1643.879	1640.992	1636.618 1636.102
Superelevation	Left Hand Edge — — — — ℄ Right Hand Edge ———			
Horizontal Alignment				CURVE R LEFT RIGHT L = 14.32 = 8.76 = 10.82 Deg 19° 21' 49"
Chainage Distance (km)		0.000	0.020	0.040 0.0448

LONGSECTION BETA PS

SCALE 1:250

PRELIMINARY DRAWING

NOTES

1. All levels, dimensions and setting out details to be verified on site prior to construction.
2. All existing drainage culverts are to be inspected , and any found in unservicable condition are to be replaced unless shown otherwise.
4. Existing road signs, services and fencing affected by construction are to be removed/relocated where necessary.
5. Underground service crossings and markers are to be in accordance with SD1001 - 3.
6. Signage schedule to be issued to TBC and revision issued.
7. All new road signs and road marking requirements are to conform to the South African Road Traffic Signs Manual (SARTSM).
8. All work is to be carried out in accordance with "COLTO Specifications for Road and Bridge Works for State Road Authorities."
9. All survey and setting out data provided is based on (WGS 84)(LO 31)
10. All road levels and setting out to be confirmed by Resident Engineer prior to construction
11. All stormwater infrastucture levels to be determined onsite by Resident Engineer. Prior to comencement of construction.
12. Driveway Access - Stormwater Concrete Pipe crossings and headwall will be confirmed on site by Resident Engineer. Drawings will be revised accordingly

REV. NO.	DATE	DESCRIPTION

CLIENT DEPARTMENT SIGNATURES

APPROVED BY

SIGNATURE

Checked by Professional Consultant

Signature: Date:

Consultant

DLV PROJECT MANAGERS AND ENGINEERS (Pty) Ltd

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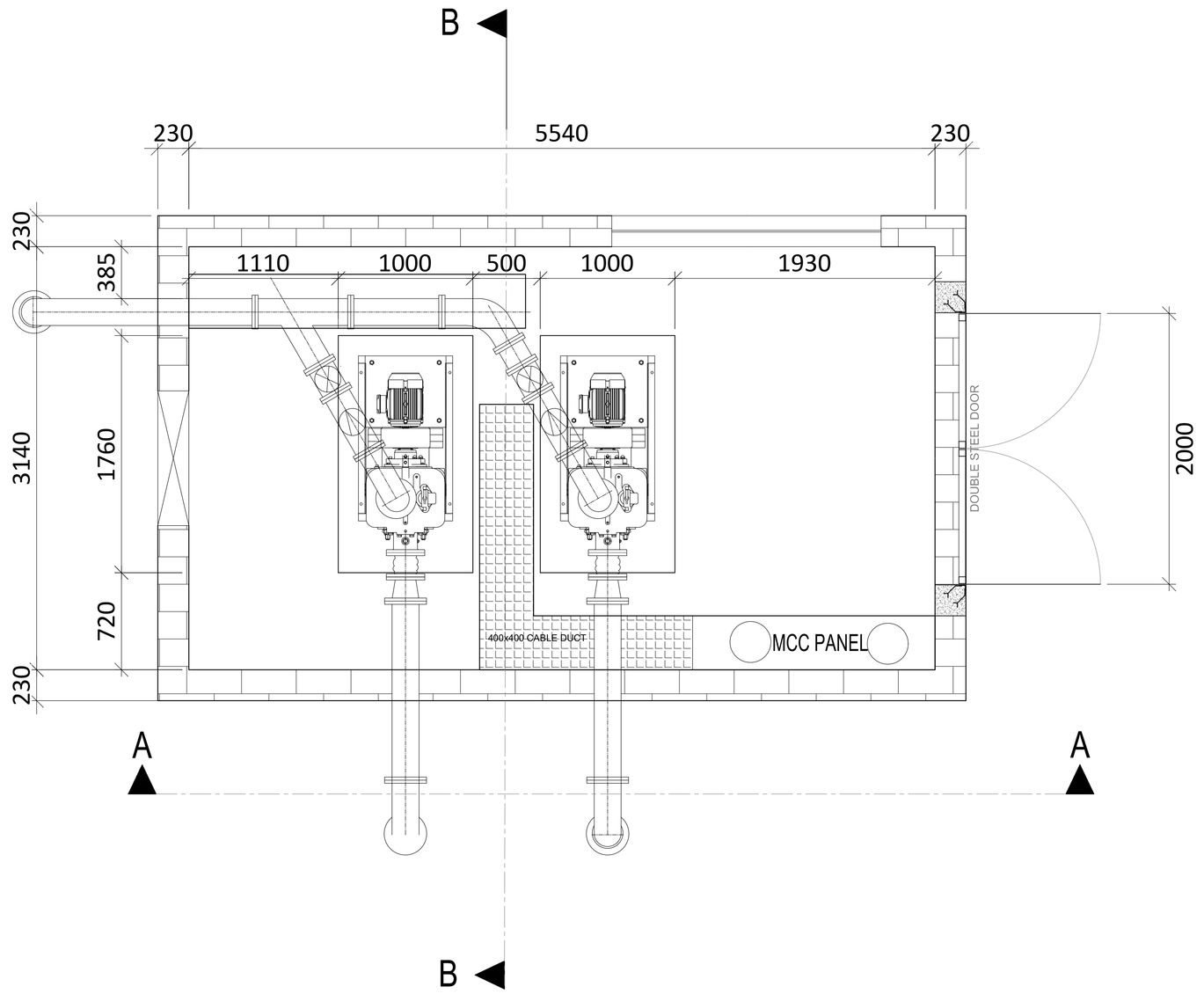
Project

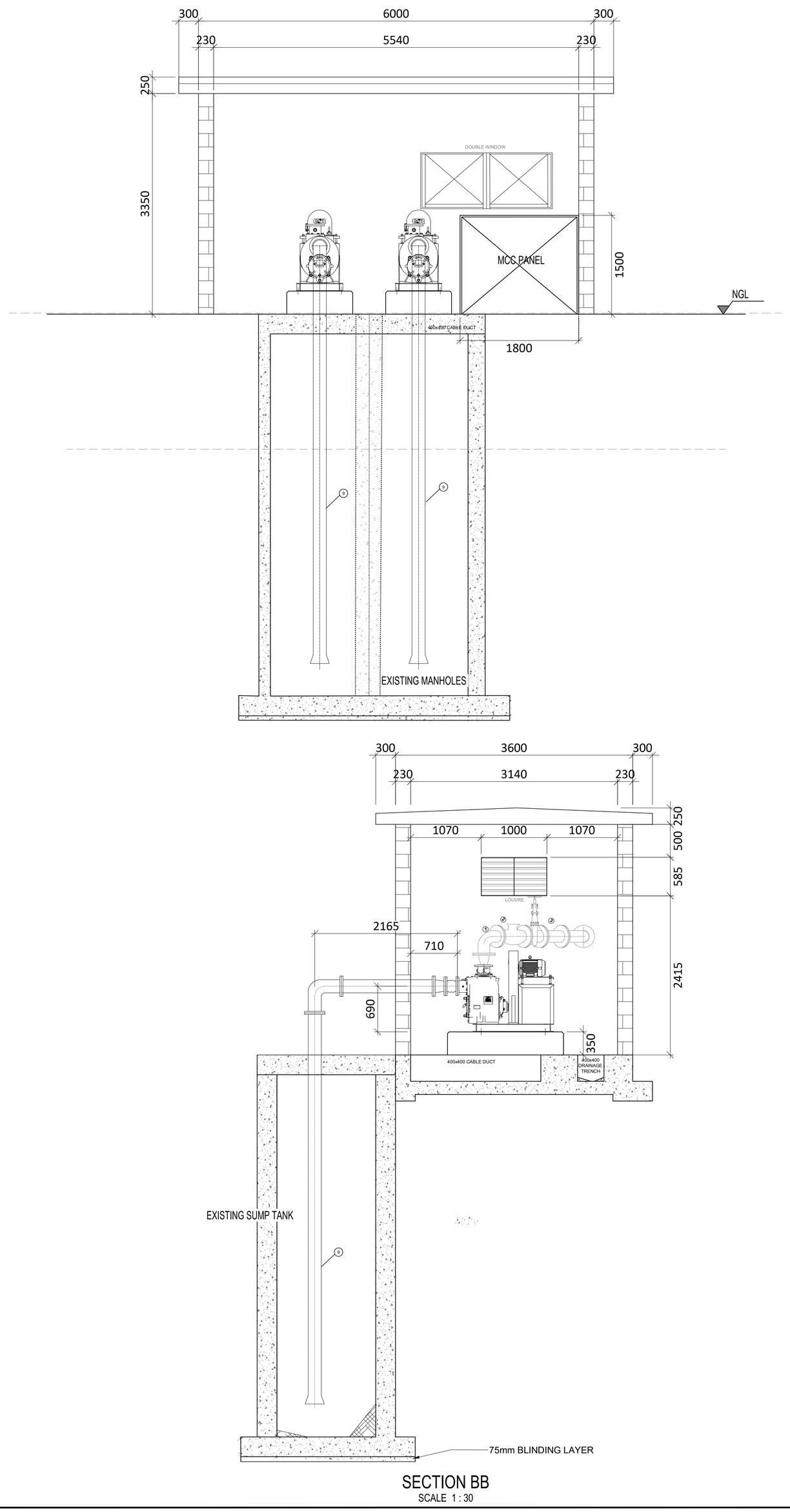
REFURBISHMENT OF BETA SEWER PUMP STATION

Drawing description

BETA PS ACCESS ROAD LAYOUT (0,000km - 0,048km)

Drawn: **J RAMGHULAM**	Date: **SEPTEMBER 2025**
Scale(s): **AS SHOWN**	Sheet No.: **Sheet 1 OF 1**
Consultant Drawing number **V62-02-05-002-LAY-T-00**	Drawing Size **A0**
Client Drawing number	





SECTION BB
SCALE 1 : 30

NOTES

Revisions

REV. NO.	DATE	DESCRIPTION
00	2023.03.XX	ISSUED FOR CONSTRUCTION

Client Department Signatures:

Approved by: .....

Signature: .....

Checked by Professional Consultant:

E. BOSCH

Signature 2023.03.XX Date

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DR PIXLEY LOCAL MUNICIPALITY

Contract:

REFURBISHMENT OF BETA SEWER PUMP STATION

Drawing description:

PUMP STATION BETA CONCRETE LAYOUT & DETAILS

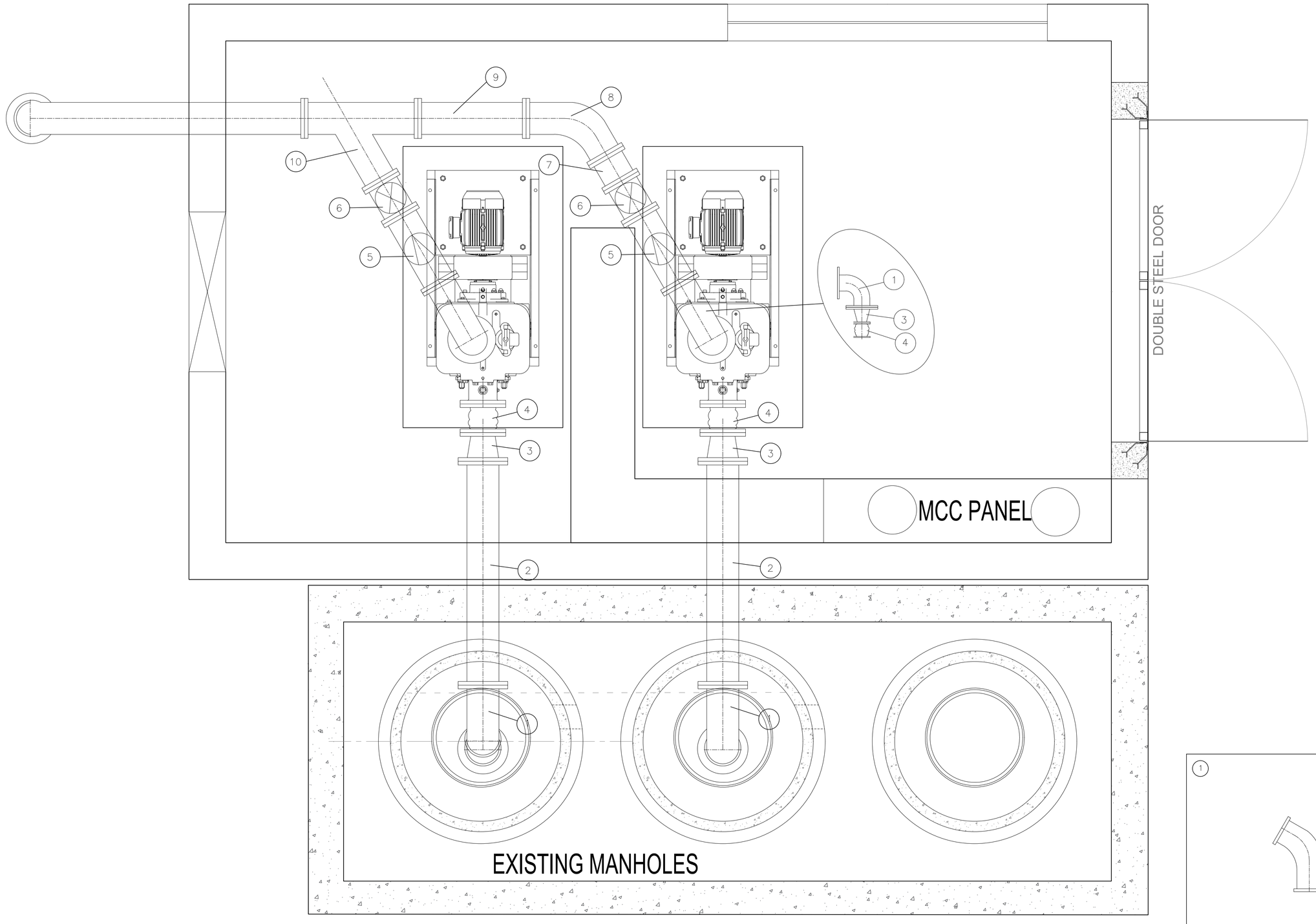
Drawn: S HLABISA **Date:** 2025/09/15

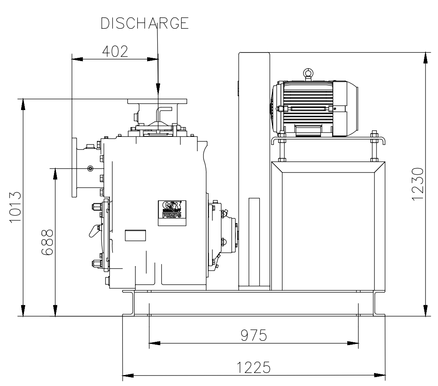
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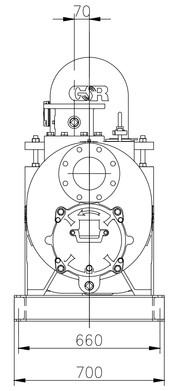
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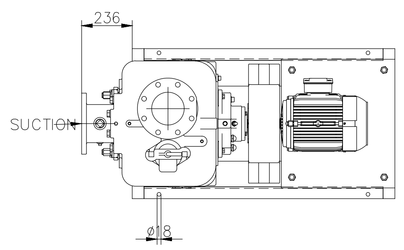
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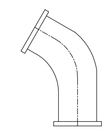
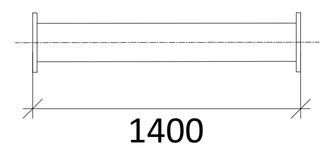
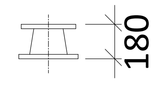
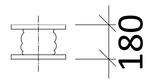
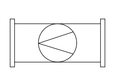
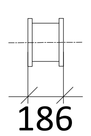
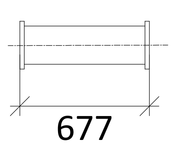
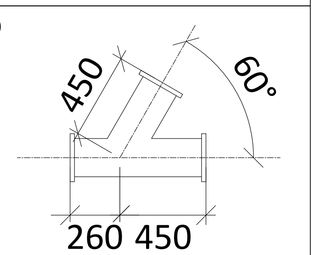
Client Drawing number:









1  Ø200mm 60° MEDIUM SEGMENT BEND STANDARD	2  Ø200mm FLANGED PIPE SPECIAL	3  150/200mm ECCENTRIC REDUCER STANDARD
4  Ø50mm FLEXIBLE COUPLING STANDARD	5  Ø200mm NON-RETURN VALVE STANDARD	6  Ø200mm WEDGE GATE VALVE STANDARD
7  Ø200mm FLANGED PIPE SPECIAL	8  Ø200mm FLANGED PIPE STANDARD	9  Ø200mm SPECIAL TEE

NOTES

Revisions

REV. NO.	DATE	DESCRIPTION
00	2023.03.XX	ISSUED FOR CONSTRUCTION

Client Department Signatures:

Approved by: .....

Signature: .....

Checked by Professional Consultant:

E. BOSCH

Signature ..... 2023.03.XX Date

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DR PIXLEY LOCAL MUNICIPALITY

Contract:

REFURBISHMENT OF BETA SEWER PUMP STATION

Drawing description:

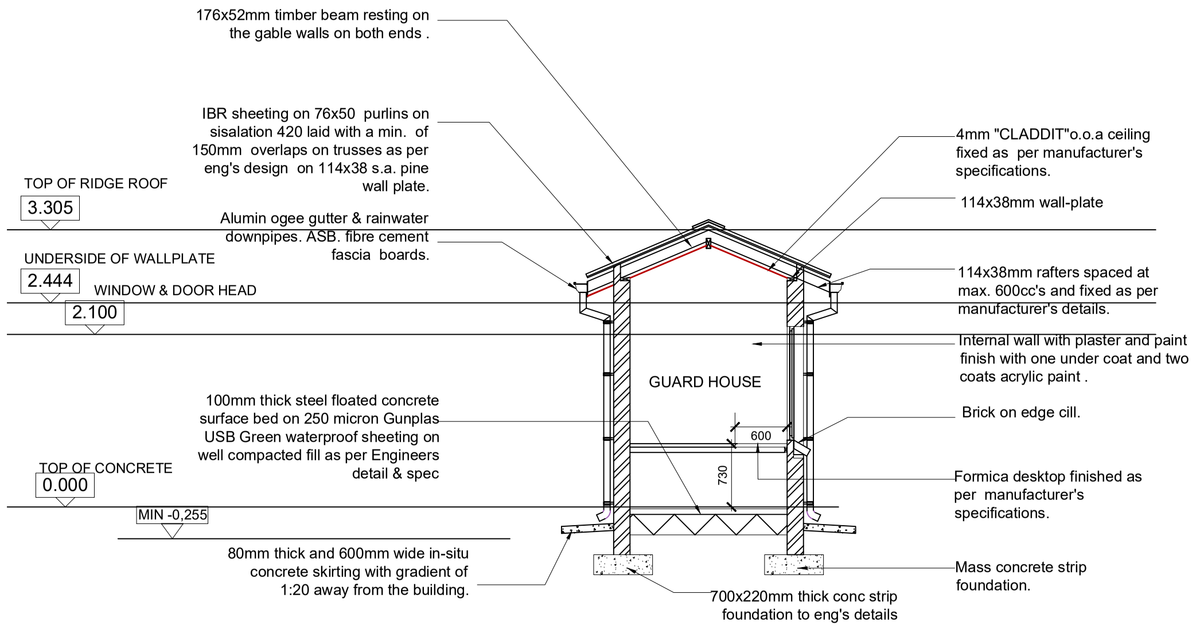
PUMP STATION BETA PUMP FITTINGS DETAILS

Drawn:	S HLABISA	**Date:**	2025/09/15
Scale(s):	AS SHOWN		

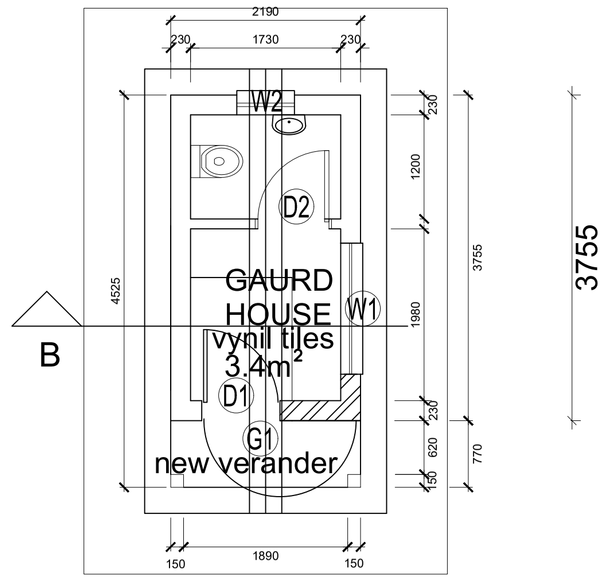
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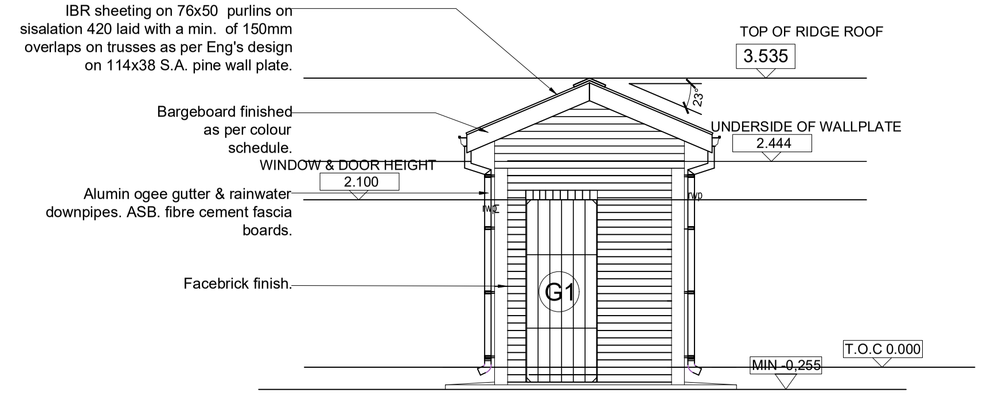
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Client Drawing number:



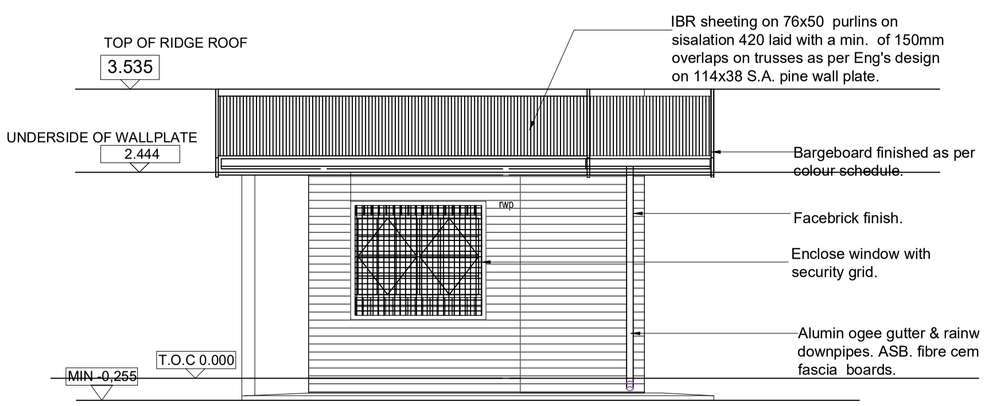
SECTION A-A SCALE 1:50



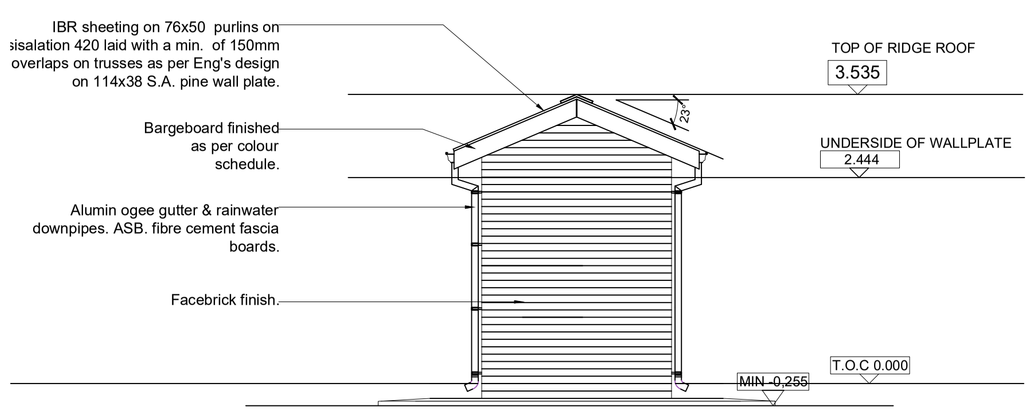


FRONT ELEVATION SCALE 1:50

FRONT ELEVATION SCALE 1:50

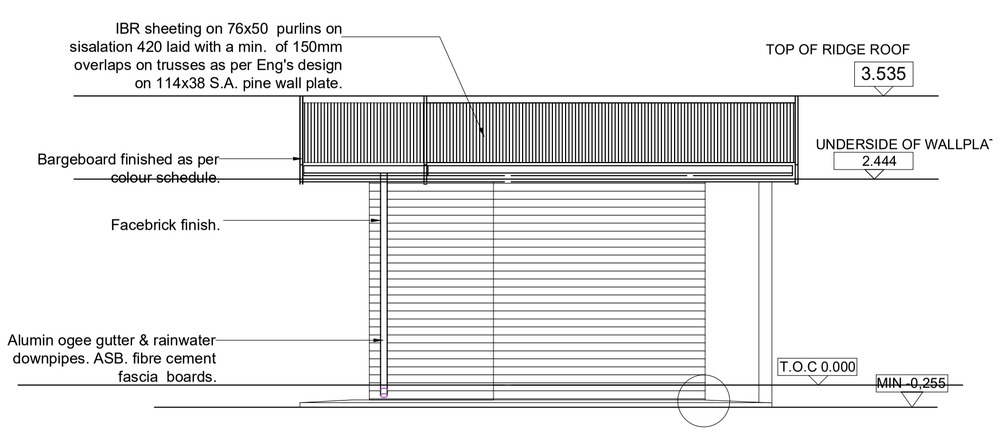


SIDE ELEVATION SCALE 1:50



BACK ELEVATION SCALE 1:50

SIDE ELEVATION S



NOTES

Revisions

REV. NO.	DATE	DESCRIPTION

Checked by Professional Consultant

Signature Date

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DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

Contract

REFURBISHMENT OF BETA SEWER PUMP STATION

Drawing description

GUARD HOUSE PLANS, SECTIONS & ELEVATION (WITH ABLUTION)

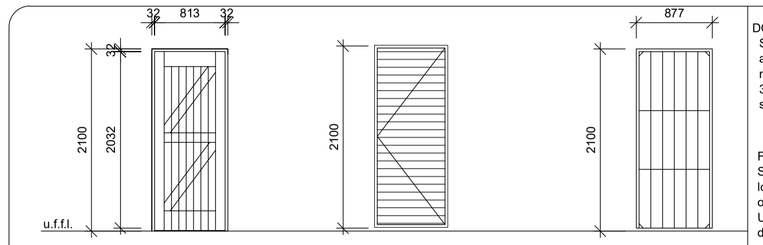
Drawn: A NGWENYA Date: 09- 2025

Scale(s): AS SHOWN

Consultant Drawing number

V62-02-04-005-GHPSE-T-00

Client Drawing number



DOOR SET 2:
SOLID ART 294 WC
anodised aluminium
mortice indicator bolt
38mm diameter door
stop screwed to wall

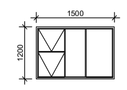
FOR DISABLED
Solid paraplegic
lockset and handles
on backplate
UNION ref AL5022-E14
disabled sign

TYPE:	D1	D2	G1 (1required)
FRAME:	Standard 1.2mm thick residential section double rebated frame.	900x2100 MILD STEEL FRAME	as per detail
F.FINISH:	Galvanised. Not painted.	Primed, undercoat and two coats gloss enamel.	Galvanised. Not painted.
DOOR:	2032x813x40mm SA Pine framed, ledged and braced battened door with 40 x 110mm stiles and top rail, 20 x 150mm middle ledge, 20 x 225mm bottom ledge and 20 x 110mm braces.	Solid Horizontal Slatted Meranti Door	gate as per detail
D.FINISH:	Primed, undercoat and two coats gloss enamel.	Primed, undercoat and two coats gloss enamel.	Galvanised. Not painted.
FURNITURE	DOOR SET 2. and 1 red rubber doorstop Applicable signage S1, S2, S3, to doors		see detail

STANDARD DOOR FRAME:
1.2mm galvanised pressed metal double rebated frame for 115mm walls complete with straps for building in. 2x100mm galvanised and welded loose-pin hinges, adjustable chrome striking plate and 2 rubber stops.

DS	SCALE:	DETAIL DESCRIPTION.
	1:50	DOOR AND GATE SCHEDULE

WINDOW SCHEDULE

	WO1	WO2
		
	No OFF REQUIRED: 1 LOCATION: MAIN HALL	No OFF REQUIRED: 1 LOCATION: MAIN HALL
CODE:	PTT 1512	PTT 66
FRAME:	1500x1200 ALUMINIUM WINDOW FRAME	590X590 ALUMINIUM WINDOW FRAME
GLAZING:	6.38mm LAMINATED SAFETY GLASS	6.38mm LAMINATED SAFETY GLASS
FINISHES:	POWDER COATED CASEMENT WINDOW UNITS AS PER APPROVED SYSTEM	POWDER COATED CASEMENT WINDOW UNITS AS PER APPROVED SYSTEM

GENERAL SPECIFICATION NOTES:
This specified drawing to be read in conjunction with the WB20 Standard Preambles.

All TRADE NAMES to be as specified or equal and approved.
ROOF:
Marley Double Roman Standard Slate concrete roof tiles size 332 x 420mm laid in straight bond at a pitch of 17.5º with a minimum head lap of 100mm, fixed with non-corrodible tile nails and/or clips (fixing category C : Each tile) to and including 38 x 38mm sawn softwood battens with galvanised clout nails at 320mm centres on SABS approved underlay with 150mm overlapped joints fixed over trusses and under tiling battens, all fixed to

Prefabricated cleated roof trusses to be to the Engineer's approval - or trusses to be manufactured on site are to be constructed to details as shown of roof plan.
Roof is to be tied down to walls with 30mm x 1.6mm thick and 1.6m long galvanised hoop iron straps built in.
Trusses to be spaced at +/- 760mm(max) c/c (as dimensioned on roof plan) resting on 114 x 38 wall plates.
HURRICANE CLIPS to be used at eaves overhangs.
At all other intersections double wound 2.5mm dia. galv. wire.
All exposed roof timber to be painted with 2 coats ABE PROVONITE, before fixing of roofing sheets, fascias and barge-boards.

Roof pitch to be 17.5 degrees

BARGEBOARD:
EVERITE NUTEC fibre-cement sockettess bargeboards (Product No 521-731) 200mm x 80mm.

Aluminium H-profile barge-board joiners (Product No 685-187). Drill for and fix with hot-dipped galvanised screws and washers. 76 x 50mm trimmer batten fixed underside of purlin ends for barge-board fixing.

WINDOWS:
Hot dipped galvanised " SS Industrial Type " metal windows.
No painting required.
4mm clear glazing with steel putty. No painting necessary.
Refer to window schedule.

DOORS:
Galvanised Stock Steel Single Rebated door frames (1.2mm thick) for 115mm brick walls - not painted with 1 pair of 100mm galvanised steel loose-pin hinges welded in position.
2032 x 813 x 40mm SA Pine framed, braced and ledged battened doors with SOLID ART 294 mortice indicator bolt.
All doors to be primed, undercoat and 2 coats - gloss enamel.

FASCIAS:
EVERITE NUTEC medium density fibre-cement fascia boards (Product no. 041-505),
15mm thick x 225mm with aluminium H-profile fascia joiners (Product no. 685-195). Drill for and fix with hot-dip galvanised drive screws and washers.

CEILINGS:
Ceiling formed of 6mm Everite Nutec plain boards fixed to and including 38 x 38mm sawn softwood brandering at 350mm centres (max) with cross brandering at joints, ends of sheets, cornices and light fittings, at 150mm centers with white PVC H-profile jointing strips over joints with all nail or screw heads stopped and sanded level and fixed to trusses.

FOUNDATIONS:
700 x 230 (25mPa) concrete strip footings under all walls with top of foundation to sit in natural ground with a minimum of 400mm below ground level and to Architect's/Engineer's approval.

GSN	DETAIL DESCRIPTION.
	GENERAL SPECIFICATION NOTES

WALLS:
SABS approved facebicks to comply with SABS 1215.
Brickforce to be built in every 5th course from slab level up.
In walls with door/window openings, brickforce is to be used at every course up.
Facebrick roller-course above all door & window openings.
All walls are to comply with "Part K" of the National Building Regulations.
Walls to be plastered internally and externally 13 - 16mm thick.
Internal plaster is to be 1:5 cement:sand mix.
Facebrick on edge cills at 30 degree slope.
Provide 350 micron and 250mm wide GUNPLAS DPC under surfacebeds.
Walls to be painted with "WALL 'n ALL" emulsion paint internally.
1200mm high Dado (internal) to be painted a darker colour. All colours to be approved by the Architect.
Beam filling to underside of roofing sheets.
Control joints to be provided at every 12m c/c., as per Engineer's details. Sealed with polysulphide sealant on backing strips and softboard insert.

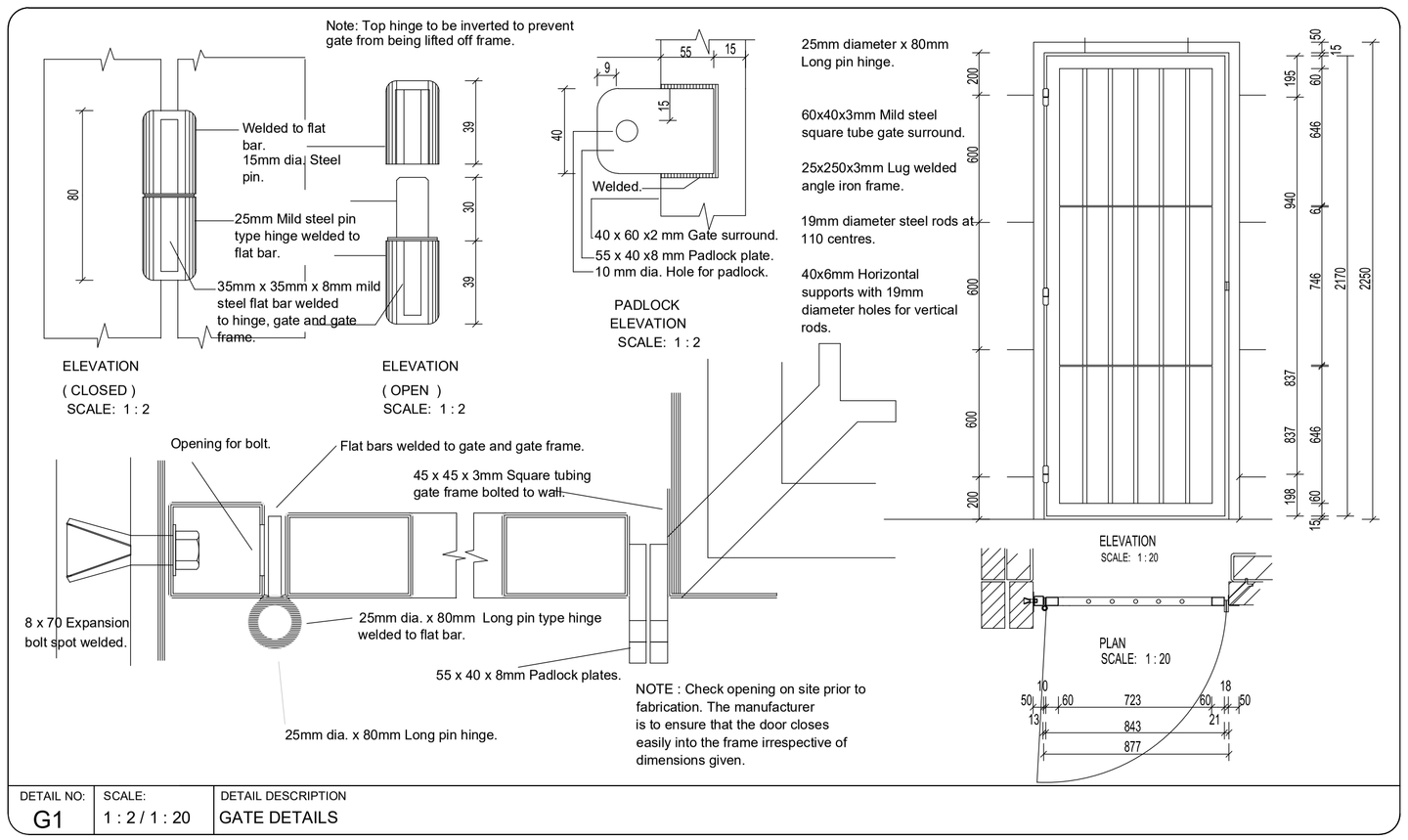
FLOORS:
100mm thick power floated finished concrete slab (25Mpa) reinforced with mesh Ref 193 set 25mm below top on 250 microns GUNPLAS USB GREEN damp-proofing membrane on 25mm riversand bed on fill compacted to MOD AASHTO 95%.
Soil to be poisoned in accordance with SABS 1165.
(Certificate must be provided)

VERANDAH WALKWAY:
100mm thick concrete slab (25Mpa) reinforced with mesh Ref 193 set 25mm below top on 250 microns GUNPLAS USB GREEN dampproofing membrane on 25mm riversand bed on fill compacted to MOD AASHTO 95%. Verandah floor to be graded to fall 50mm and cast in panels at 1850 centres. Control Joints at every 7.4m centres, as per Engineer's detail. Finish to be wood float non-slip. Control joints sealed with Polysulphide sealant with backing strip and softboard.

CONCRETE APRONS / CHANNELS
Concrete aprons laid to a fall of 1:200 and in panels with control joints at every 2m centres on fill compacted to MOD AASHTO 95% as per Engineer's detail.
Control joints sealed with Polysulphide sealant with backing strip and softboard.

BACKFILL:
Filling to be approved clean earth, well watered and rammed in layers not exceeding 150mm in depth and thoroughly consolidated to a density of 95% MOD AASHTO, as per Engineer's detail.

GSN	DETAIL DESCRIPTION.
	GENERAL NOTES CONTINUED



DETAIL NO:	SCALE:	DETAIL DESCRIPTION
G1	1 : 2 / 1 : 20	GATE DETAILS

NOTES

Revisions

REV. NO.	DATE	DESCRIPTION

Checked by Professional Consultant

Signature Date

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DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

Contract
REFURBISHMENT OF BETA SEWER PUMP STATION

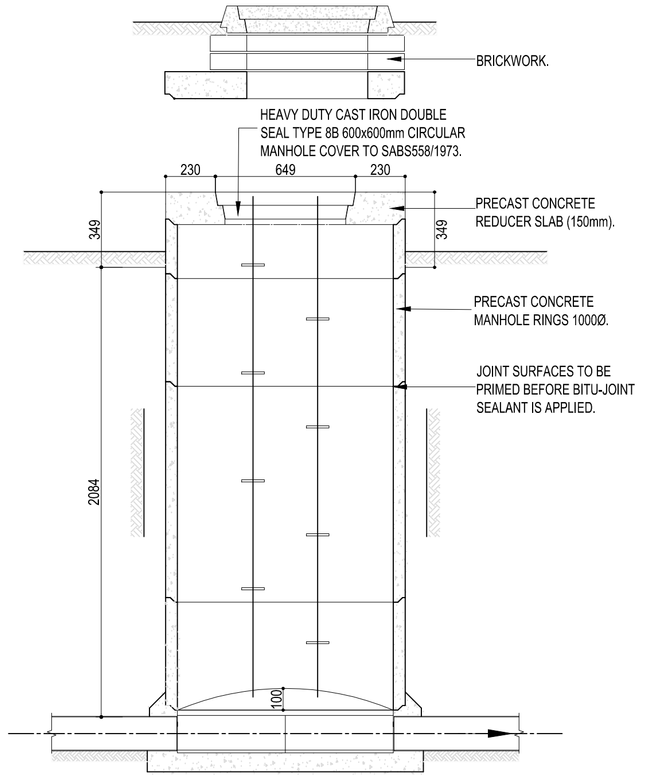
Drawing description
DOORS, WINDOW, GATE SCHEDULE AND DETAILS

Drawn: A NGWENYA Date: 09- 2025

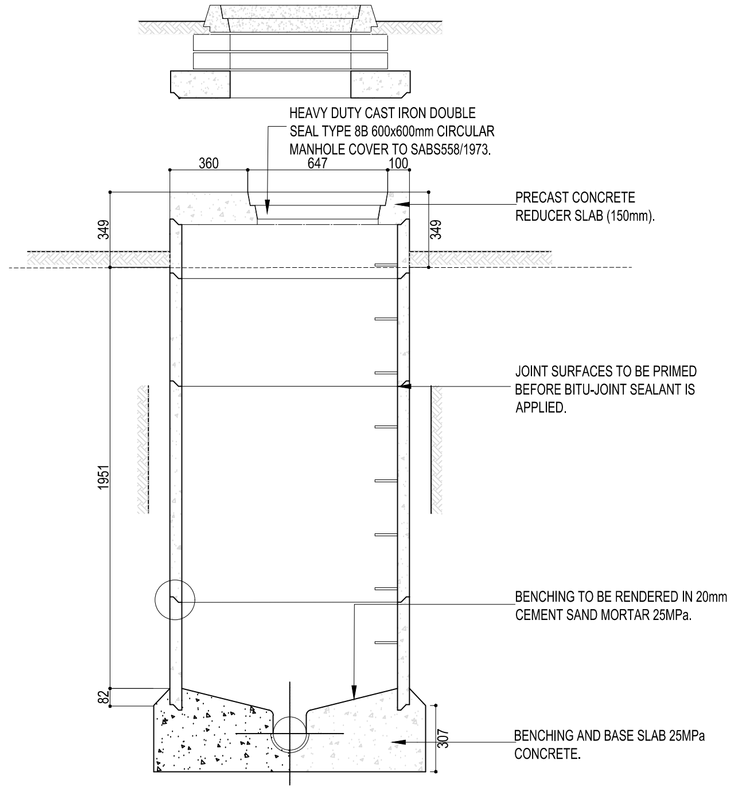
Scale(s): AS SHOWN

Consultant Drawing number
V62-02-04-006-DET-T-00

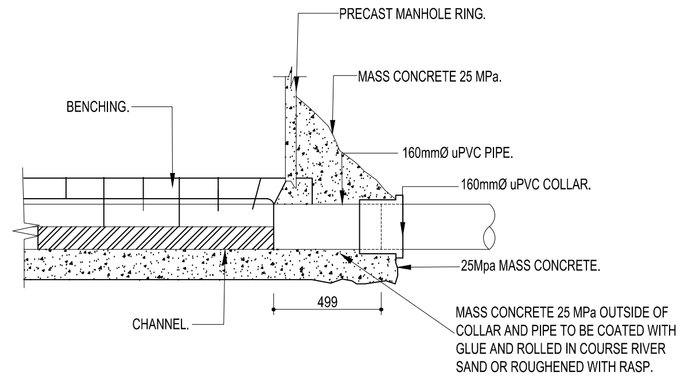
Client Drawing number



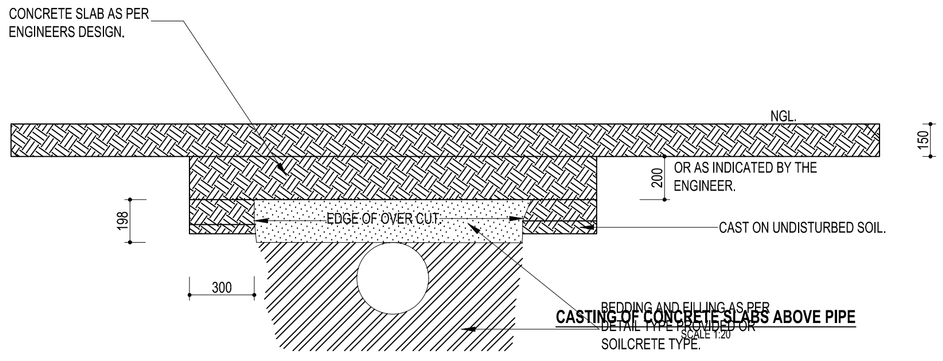
MANHOLE SECTION
SCALE 1:20



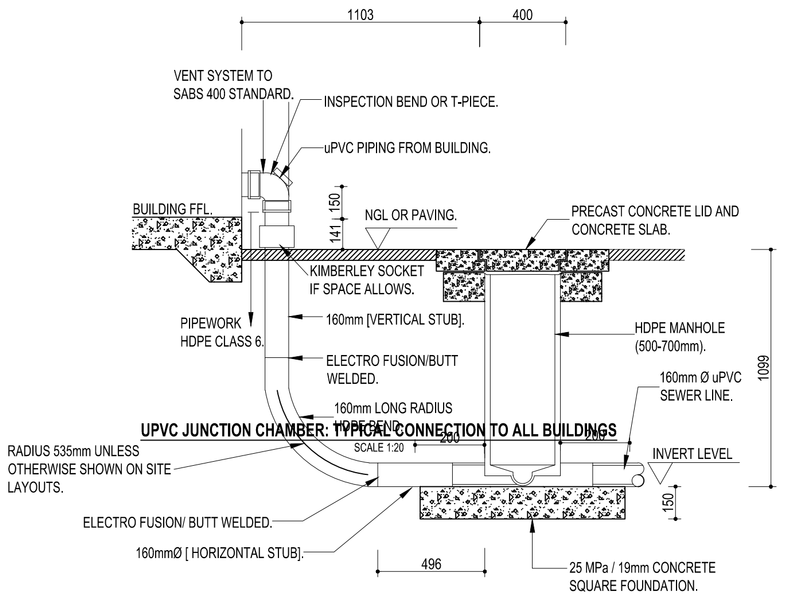
MANHOLE SECTION
SCALE 1:20



FLEXIBLE CONNECTION TO MANHOLES(INLET AND OUTLET)
SCALE 1:20



CASTING OF CONCRETE SLABS ABOVE PIPE
SCALE 1:20



UPVC JUNCTION CHAMBER: TYPICAL CONNECTION TO ALL BUILDINGS
SCALE 1:20

NOTES

LEGENDS

Revisions

REV. NO.	DATE	DESCRIPTION

Checked by Professional Consultant: SM

Signature: 04-2025 Date

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DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

Contract

CONSTRUCTION OF BETA SEWER PUMP STATION

Drawing description

SEWER MANHOLE AND CONNECTION DETAILS

Drawn: A NGWENYA Date: 04- 2025

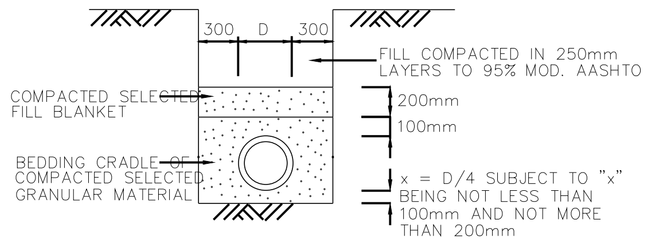
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Consultant Drawing number

V62-02-03-008-SWMDET-T-00

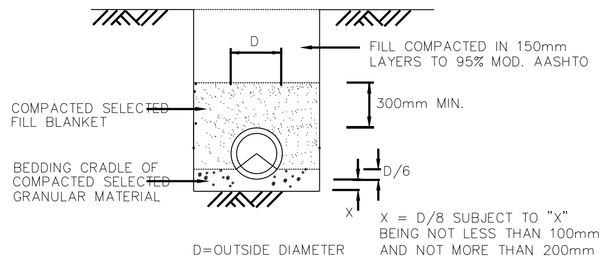
Client Drawing number

PIPE BEDDING DETAILS FOR RIGID AND FLEXIBLE SEWER PIPES



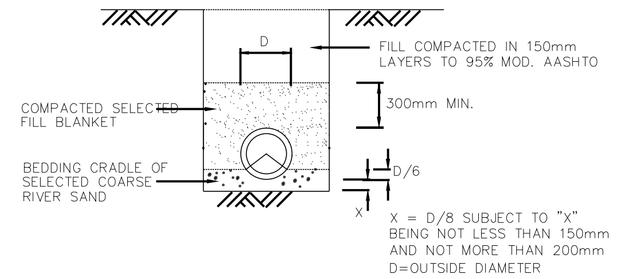
FLEXIBLE PIPE BEDDING

SCALE 1 : 10



RIGID PIPE BEDDING TYPE A

SCALE 1 : 10

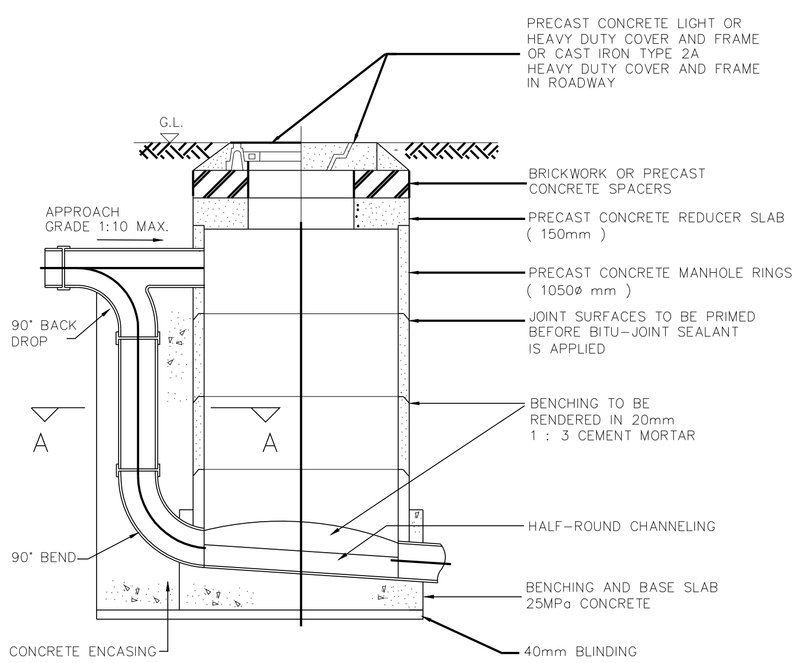


RIGID PIPE BEDDING TYPE B

SCALE 1 : 10

NOTES:
ALLOW 1/3 OF ALL SEWER BEDDING TO BE TYPE B BEDDING
REMAINING 2/3 OF SEWER BEDDING TO BE TYPE A BEDDING

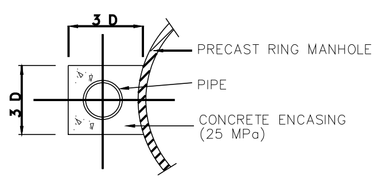
SEWERAGE – DROP INLET MANHOLE



TYPICAL SECTION

SCALE 1 : 25

● FOR DROPS GREATER THAN 1000mm.

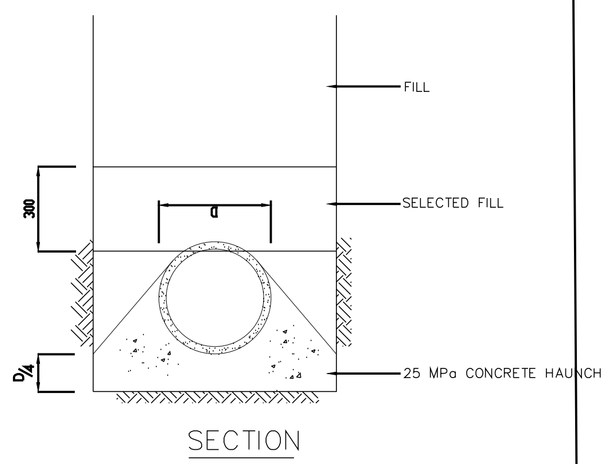


SECTION A–A

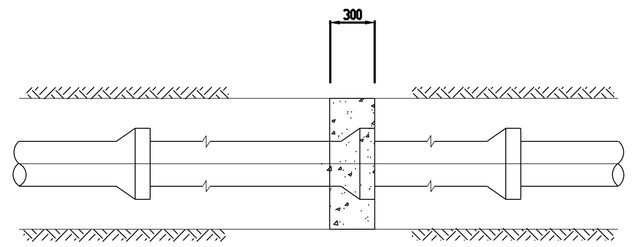
SCALE 1 : 25

● CONCRETE ENCASING 3 x ø OF PIPE

TYPICAL ANCHOR BLOCK DETAIL

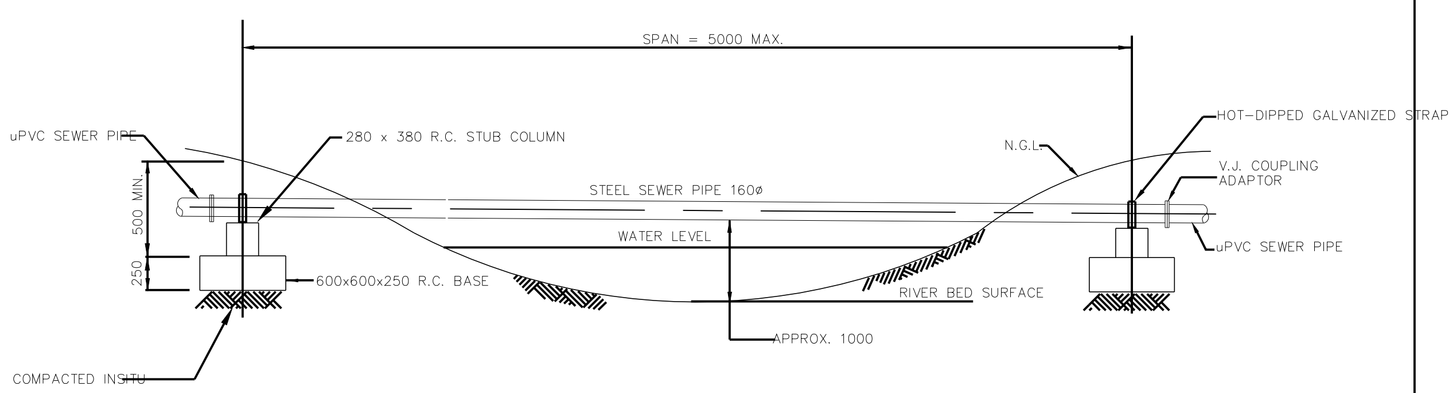


SECTION



PLAN

TYPICAL PIPE BRIDGE



SECTION PIPE BRIDGE

SCALE 1 : 25

NOTES

LEGENDS

a. LANDSCAPE AROUND ALL CHAMBERS, SO THAT FINISHED GROUND LEVEL IS 200mm BELOW TOP OF CHAMBER, 1m AROUND EACH CHAMBER, WHERE CHAMBERS ARE LOCATED IN ROADS, ROOF SLAB TO PROTRUDE MAX. 20mm ABOVE SURROUNDING ROAD.

b. VENTILATION TO BE FABRICATED FROM 3CR12 AND VENTILATOR TO BE CAST IN TOP SLAB.

c. MASS CONCRETE BASE REQUIRED IN WET AREAS.

d. STRUCTURAL CONCRETE TO BE CLASS 30/19.

e. ALL FITTINGS , FLANGES, ETC TO BE ORDERED TO THE FOLLOWING TABLE:
PN16 PIPES: SANS 1123, TABLE 1600/3
PN25 PIPES: ≤ 600 DNSANS 1123, TABLE 2500/3
> 600 DN SABS 4504

f. ALL MILD STEEL PIPES AND FITTINGS SHOULD BE HOT-DIPPED GALVANIZED.

g. ALL PIPES AND FITTINGS SHALL BE SUPPLIED COMPLETE WITH COUPLINGS AND JOINTING MATERIAL.

h. BRICKS SHALL BE OBTAINED FROM THE APPROVED MANUFACTURER AND THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE SAMPLES OF BRICKS HE INTENDS TO USING IN THE CONSTRUCTION OF WORKS.

i. CONCRETE SHALL COMPLY WITH REQUIREMENTS OF SABS 1200G/ 1200GA.

j. ALL FITTINGS DIMENSIONS TO BE CONFIRMED ON SITE BEFORE FABRICATION.

Revisions

REV. NO.	DATE	DESCRIPTION
00	30/06/2025	ISSUED FOR CONSTRUCTION

Checked by Professional Consultant: SM

Signature

Date: 06-2025

PROJECT MANAGERS & ENGINEERS
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DR. PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY

Contract

CONSTRUCTION OF BETA SEWER PUMP STATION

Drawing description

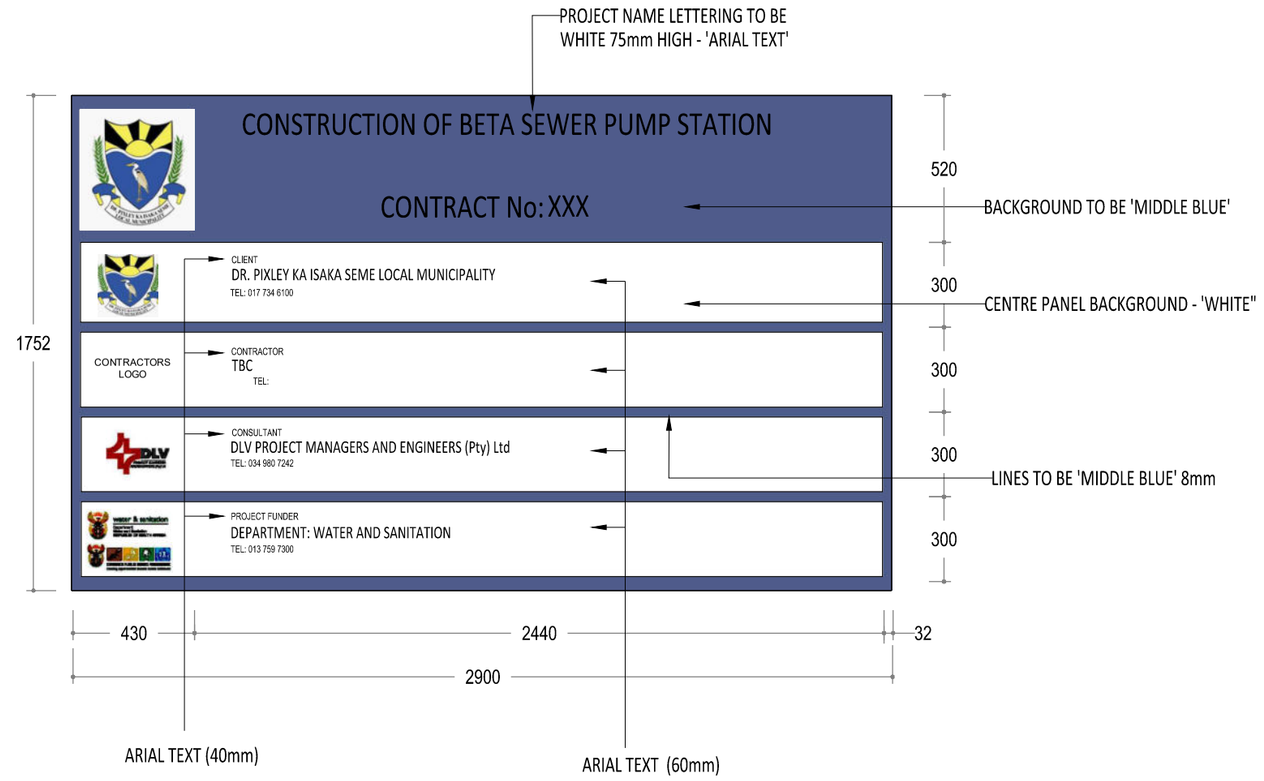
STANDARD SEWER DETAILS

Drawn: A NGWENYA Date: 06- 2025

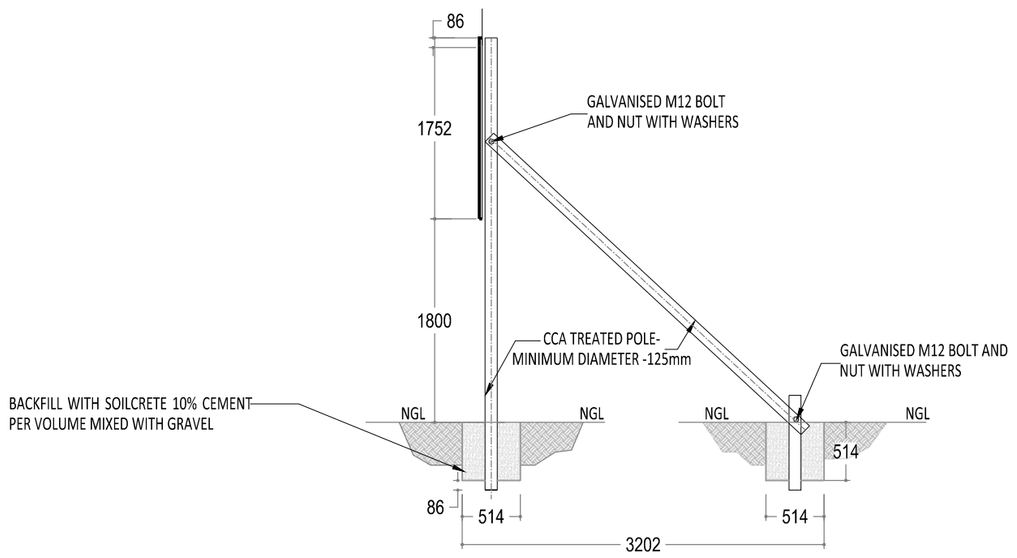
Scale(s): AS SHOWN

Consultant Drawing number: **V62-02-03-009-DET-C-00**

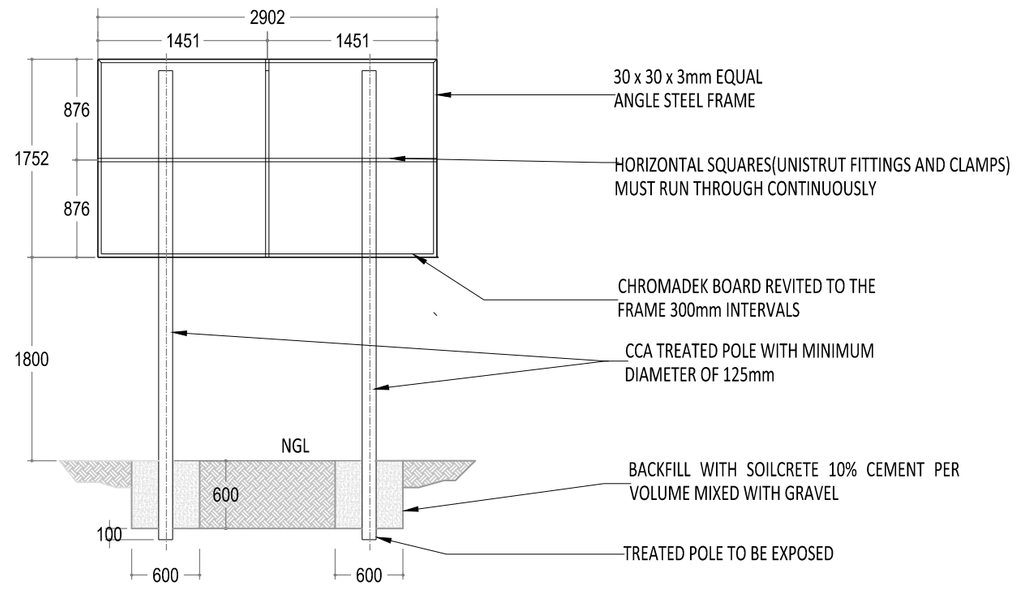
Client Drawing number



NAME BOARD
SCALE 1:20



SIDE VIEW
SCALE 1:50



FRONT VIEW
SCALE 1:50

LEGENDS

a. COLOURS IN ACCORDANCE WITH SANS 1091 : 2004
   B11: DARK EARTH
   F07: MIDDLE BLUE
   G04: BLUE GREY
   G80: CLOUD WHITE

b. SUPPORTS TO BE CCA TREATED POLES WITH A MINIMUM DIAMETER OF 125mm.

c. SOILCRETE BACKFILL TO BE WELL COMPACTED.

d. UNISTRUT FITTINGS AND CLAMPS TO BE USED.

e. ALL DIMENSIONS IN MILLIMETERS (mm) UNLESS STATED OTHERWISE.

Revisions

REV. NO.	DATE	DESCRIPTION

Checked by Professional Consultant — SM

Signature — 06-2025 Date

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Contract

CONSTRUCTION OF HOOF SEWER PUMP STATION

Drawing description

PROJECT SIGNBOARD

Drawn: ZULU LLP Date: 06- 2025

Scale(s): AS SHOWN

Consultant Drawing number
V62-02-03-010-SB-C-00

Client Drawing number