



METSIMAHOLO LOCAL MUNICIPALITY

UPGRADING OF SASOLBURG WATER PUMP STATION

BID NO.: MLM 21/2022/23

**CIDB GRADING: 6 ME OR HIGHER
(VOLUME 3)**

ISSUED BY:

Metsimaholo Local Municipality
Municipal Building
10 Fichardt Street
Sasolburg
4800



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Name of Company	:
Contact Name	:
Contact No	:
Email Address	:
CSD Supplier Number	:
CIDB: CRS Number	:
Tender Amount (VAT incl.):		R

TENDER NUMBER: MLM 21/2022/23

UPGRADING OF SASOLBURG WATER PUMP STATION

LIST OF CONTRACT DOCUMENTS

The following documents form part of this contract:

- Volume 1: The General Conditions of Contract for Construction Works, Second Edition (GCC 2015), published by the South African Institute of Civil Engineers, which the Tenderer shall purchase himself (see note 1 below).
- Volume 2: SANS 1200 The Standard Specifications for Civil Engineering Construction
- Volume 3: The Project Document containing the Tender Notice, Conditions of Tender, Tender Data, Returnable Schedules, Form of Offer, General and Particular Conditions of Contract, Pricing Schedule, Project Specifications and Site Information, issued by the Employer (see note 4 below). The Employer's Form of Acceptance and any correspondence from the selected Tenderer, performance security-demand guarantee and all addenda issued during the period of tender will also form part of this volume once a Tenderer has been appointed.
- Volume 4: The civil, mechanical, and electrical drawings are part of Volume 3

Notes to Tenderer

1. **Volume 1 is obtainable from SAICE, Private Bag X200, Halfway House, 1685.**
Tel: +27 11 805 5947 Fax: +27 11 805 5971, email: civilinfo@saice.org.za.
Website: <http://www.saice.org.za>
2. **Volume 2 is obtainable from SA Bureau of Standards Dr Lategan Road; Groenkloof; Pretoria; 0001. Private Bag X191, Pretoria, 0001.**
3. **Volume 3 is obtainable from SAICE, Private Bag X200, Halfway House, 1685.**
Tel: +27 11 805 5947 Fax: +27 11 805 5971, email: civilinfo@saice.org.za.
Website: <http://www.saice.org.za>
4. **Volume 3 is issued at tender stage as per tender advertisement. The pricing data is available on request in Excel format**

At contract stage Volume 3 will be a bound signed paper copy containing the following documents:
 - Returnable schedules relevant to the project
 - Agreements and Contract Data
 - Pricing Data
 - Scope of Work
 - Site Information
5. **SUBMISSION OF TENDER – Refer to clause F2 in the Tender Data**

Information provided by a Tenderer over and above the above elements of Volume 3 shall be treated as information only and will only be bound into the document if the tenderer

notes on Form A4: Schedule of Variations or deviations that the information has a bearing on the tender price.

- 6. For alternative offers, the Tenderer shall refer to clause F2.12 in the Tender Data**

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UPGRADING OF SASOLBURG WATER PUMP STATION

PART T1: TENDERING PROCEDURES

PART T2: RETURNABLE DOCUMENTS

T.1.1 TENDER NOTICE AND INVITATION TO TENDER



TENDER NOTICE

BID NO: MLM 21/2022/23

METSIMAHOLO LOCAL MUNICIPALITY invites tenders for the **UPGRADING OF SASOLBURG WATER PUMP STATION**.

Tenderers should have a CIDB Contractor grading designation of **6ME** or higher.

Bid documents will be available during working hours upon payment of R1000.00 at The Municipal Building, 10 Fichardt Street, Sasolburg. Documents can also be downloaded for the e-tender portal www.e-tenders.gov.za for free.

No clarification meeting will be required.

It is a pre-requisite that Bidders must be in good standing with SARS, have the requisite CIDB certificate, and must be registered on the Central Supplier Database (CSD).

The closing time and date for receipt of tenders is **31 March 2023, 11H00**. Bid documents, clearly marked BID MLM 21/2022/23; UPGRADING OF SASOLBURG WATER PUMP STATION must be deposited in the bid box at the Municipal Building, 10 Fichardt Street, Sasolburg before the closing time. Bid documents will be opened in public soon after the closing time. Telegraphic, telephonic, telex, e-mail, facsimile and late tenders will not be accepted. Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the Tender Data.

Service providers will be adjudicated according to the Supply Chain Management Policy using the 80/20 point system, based on the Preferential Procurement Policy Framework Act 5 of 2005 and MFMA, Act 56 of 2003 as well as the Broad-Based Black Economic Empowerment Act, Act 53 of 2003.

Queries relating to the issues of these documents may be addressed to:

Administrative:

Sibusiso Bila

Tel No. +27 16 973 8487

E-mail: sibusiso.bila@metsimaholo.gov.za

Technical:

Mr P. Ramasimong

Tel No. +27 18 462 1575

E-mail: pule@prdcon.co.za

T1.2 CONDITIONS OF TENDER

T1.2 CONDITIONS OF TENDER

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 of tender, 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) in compatibility 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, *or any official in the public service or in the employ of an Organ of State*, 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
- g) **tenderer** means *any organisation who is represented by a duly authorised employee, partner, shareholder or director that responds to the Tender Notice by drawing tender documents*
- h) **these conditions of tender** mean *the Standard Conditions of Tender (as published and amended from time to time by the Construction Industry Development Board) and the employer's Special Conditions of Tender, the latter are demonstrated by appearing in italics.*

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 readily read, copied and recorded. Communications shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a 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 *does not bind itself to accept the lowest or any other tender, and may, in addition*, accept or reject any variation, deviation, tender offer, or alternative tender offer, and may cancel the tender process and reject all tender offers at any time before the formation of a contract. The employer shall not accept or incur any liability to a tenderer for such cancellation and rejection, but will give written reasons for such action upon written request to do so.

F.1.5.2 The employer may not subsequent to the cancellation or abandonment of a tender process or the rejection of all responsive tender offers re-issue a tender covering substantially the same scope of work within a period of six months (*measured between the relevant closing dates of the abandoned tender and the re-issued tender*) unless only one tender was received and such tender was returned unopened to the tenderer, *or if there is agreement by the participating tenderers.*

F.2 Tenderer's obligations

F.2.1 Eligibility

F.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with the 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 *attending any clarification meeting*) and 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, *regardless whether or not a tender offer is submitted*, 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, *in person or designate a suitably qualified person in the direct employ of the tenderer*, 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. *Any variation or deviation based on a point for which clarity should have been requested may render a tenderer's offer non-responsive in terms of F.3.8.*

F.2.9 Insurance

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

F.2.10 Pricing the tender offer

F.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all *costs prescribed as being applicable to the specified pay items as well as 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.*

F.2.10.2 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 otherwise stated in the tender data, submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted as well as a schedule that compares the requirements of the tender documents with the alternative requirements that are proposed. *Alternative tender offers shall not alter any contingency pay items provided in the tender documents, or offer fixed prices (except where such are provided in the postulated pricing schedule) or a fixed price contract.*

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.2.12.3 *Qualify a tender offer (except that no qualifications shall be in conflict with F.2.8) but undertake to do so by submitting such qualification in terms of F.2.12.1 and F.2.12.2.*

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 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 in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.

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

F.2.13.9 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 *modified, corrected*, withdrawn or substituted by giving the employer written notice before the closing time for tenders that a tender is to be *modified, corrected*, 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 the packages clearly marked as "SUBSTITUTE".

F.2.17 Clarification or withdrawal of tender offer after submission

F.2.17.1 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 or *adjusting of imbalanced rates*, by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

F.2.17.2 *Accept that the employer may, at its sole discretion, accept a less favourable tender from those already received or invite fresh tenders if a tenderer, at any time after the opening of his tender offer but prior to the signing of a contract based on his tender offer:*

- a) *withdraws his tender; or*
- b) *gives notice of his inability to execute the contract in terms of his tender; or*
- c) *fails to sign a contract or furnish the performance security within the period fixed in the letter of award or any extended period fixed by the employer; or*
- d) *fails to comply with a request made in terms of F.2.17.1 or F.2.18.1,*

in which case such tenderer shall be automatically barred from tendering on any of the employer's future tenders for a period to be determined by the employer, but not less than twelve (12) months, from the date of tender closure. The employer may fully or partly exempt a tenderer from the provisions of this condition if he is of the opinion that the circumstances justify the exemption.

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 *and may invoke the same remedy as provided for under F.2.17.2.*

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

F.2.18.3 *Accept the employer's right, at its sole discretion, to appoint suitably qualified persons to report on the financial resources, standing with the South African Revenue Service regarding all taxes, management structure and ownership details of any tenderer and/or to verify the correctness of any information furnished to the employer in terms of F.2.17.1. Comply with the employer's request within the time stated in the request. Failure on the part of the tenderer to cooperate with such an inquiry shall entitle the employer to declare such tender offer as non-responsive and may invoke the same remedy as provided for under F.2.17.2.*

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 *tender* 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 prequalify 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 a 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 prequalified 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 that tender documents are available until three working 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 *tender* documents.

F.3.3 Return late tender offers

Return tender offers *withdrawn in terms of F.2.16.3* or 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 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 *equal to or more than* the minimum number of points for quality stated in the tender data, and announce the total price. 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

F.3.7.1 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. *In addition, any such disqualification shall entitle the employer, at its sole discretion, to impose a specified period during which tender offers will not be accepted from the offending tenderer.*

F.3.7.2 *Communicate to other state tender boards, provincial tender boards or parastatal tender boards any tenderer disqualified in terms of special condition F.3.7.1.*

F.3.7.3 *Consider rejecting any tender offers received from tenderers who are involved in any form of litigation or legal proceedings by or against the Employer.*

F.3.7.4 *Reject any offer from a tenderer who has not purchased the tender documents in his own name or in the name of a fellow member of a joint venture.*

F.3.7.5 *Reject any offer from a tenderer that contains information or data that is not in compliance with the minimum key staff qualification requirements.*

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 *unless it can be subsequently rendered responsive by correction of non-material deviations.*

F.3.9 Arithmetical errors, omissions, discrepancies and imbalanced unit rates

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

F.3.9.2 Check *responsive* tender offers for:

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

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 total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the unit rate shall be corrected.
- b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall be *corrected*.
- c) *Where the unit rates are imbalanced request tenderers to amend and adjust any rates declared imbalanced by the employer while retaining the total of the prices derived after any adjustment made.*

F.3.9.5 Consider the rejection of a tender offer if the tenderer does not correct or accept the correction of his arithmetical errors or amend/adjust an imbalanced unit rate in the manner described above.

F.3.10 Clarification of a tender offer

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

F.3.11 Evaluation of tender offers

F.3.11.1 General

Appoint an evaluation panel of not less than three persons. Reduce each responsive tender offer to a comparative offer and evaluate 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 this sub clause 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 tender 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 this 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 tender evaluation points to the lowest.
- d) Recommend tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
- 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 this 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, preference claimed, if any, and the quality offered in accordance with the provisions of F.3.11.7 to 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, unless otherwise stated in the tender data:

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

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 preferences 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 tender 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 this 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	$A = (1 + \frac{P - P_m}{P_m})$	$A = P_m / P$
2	Lowest price or percentage commission / fee	$A = (1 - \frac{P - P_m}{P_m})$	$A = P_m / P$
P_m is the comparative offer of the most favourable comparative offer (<i>excluding all Provisional and Prime Cost Sums and the associated VAT</i>). P is the comparative offer of the tender offer under consideration (<i>excluding all Provisional and Prime Cost Sums and the associated VAT</i>).			

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

F.3.12 Insurance provided by the employer

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

F.3.14.1 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.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

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 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 stated in the tender data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

F.3.18 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.

F.3.19 Delegation of authority

The Employer may delegate any power vested in him by virtue of these Conditions of Tender to an officer or employee of the Employer.

T1.3 TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in Annex F of the CIDB Standard for Uniformity in Construction Procurement (May 2010) as published in Government Gazette No 33239, Board Notice 86 of 2010.

The Standard Conditions of Tender make several references to the tender data for details that apply specifically to this tender. The tender data shall have precedence in the interpretation of any ambiguity of inconsistency between it and the Standard Conditions of Tender.

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

Sub- clause	Data
F.1.1	The Employer is Metsimaholo Local Municipality.
F.1.2	<p>The Project Document issued by the Employer consists of the following:</p> <p>THE TENDER</p> <p>Part T1: Tendering procedures:</p> <p style="padding-left: 40px;">T1.1 Tender notice and invitation to tender</p> <p style="padding-left: 40px;">T1.2 Tender Data</p> <p>Part T2: Returnable documents</p> <p style="padding-left: 40px;">T2.1 Returnable Schedules required for Tender Evaluation</p> <p style="padding-left: 40px;">T2.2 Other Documents required for Tender Evaluation</p> <p style="padding-left: 40px;">T2.3 Returnable Schedules that will be incorporated into the Contract</p> <p>THE CONTRACT</p> <p>Part C1: Agreements and contract data</p> <p style="padding-left: 40px;">C1.1 Form of Offer and Acceptance</p> <p style="padding-left: 40px;">C1.2 Agreement in terms of Occupation Health and Safety Act</p> <p style="padding-left: 40px;">C1.3 Form of Guarantee</p> <p style="padding-left: 40px;">C.1.4 Contract Data</p> <p>Part C2: Pricing data</p> <p style="padding-left: 40px;">C2.1 Pricing instructions</p> <p style="padding-left: 40px;">C2.2 Bills of quantities</p> <p>Part C3: Scope of work</p> <p>Part C4: Site information</p> <p style="padding-left: 40px;">Drawings</p>

Tender data contd.

Sub-clause	Data
F.1.3	The Tender Document is available upon payment of R1000.00 or can be downloaded free of charge from the e tender website.
F.1.4	<p>Name: Pule Ramasimong Development Consultant</p> <p>Address: 06 De La Harpe Street, Kleksdorp, 2570</p> <p>Contact person: Pule Ramasimong</p> <p>Tel: +27 18 462 1575</p> <p>Cell: +27 83 745 8693</p> <p>E-mail: pule@prdcon.co.za</p>
	Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to 6 ME or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for an 6ME class of construction work, are eligible to have their tenders evaluated.
	<p>a) Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to 6 ME or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for an 6ME class of construction work, are eligible to have their tenders evaluated.</p> <ol style="list-style-type: none"> every member of the joint venture is registered with the CIDB; the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for an 6ME class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

Tender data contd.

Sub-clause	Data
F.1.4	<p>b) The following tenderers who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated:</p> <ol style="list-style-type: none"> 1. contractors who have a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) of 25(7A) of the Construction Industry Development Regulations, for an 6 ME class of construction work; and <ul style="list-style-type: none"> • the employer is satisfied that such a contractor has the potential to develop and qualify to be registered in that higher grade as determined in accordance with the provisions of the CIDB Specification for Social and Economic Deliverables in Construction Works Contracts; and • the employer agrees to provide the financial, management or other support that is considered appropriate to enable the contractor to successfully execute that contract. <p>c) No clarification meeting will be required.</p>
F.2.1	<p>Eligibility</p> <p>Only those tenderers who satisfy the following eligibility criteria and who provide the required evidence in their tender submissions are eligible to submit tenders and have their tenders evaluated:</p> <ol style="list-style-type: none"> a) Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to 6 ME or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations, for a 6ME class of construction work, are eligible to have their tenders evaluated. <p>Joint ventures are eligible to submit tenders provided that:</p> <ul style="list-style-type: none"> - every member of the joint venture is registered with the CIDB; - the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for an 6 ME class of construction work or a value determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations.

Tender data contd.

Sub-clause	Data
F.2.1	<p>b) The following tenderers who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated:</p> <ol style="list-style-type: none"> I. contractors who have a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25 (1B) of 25(7A) of the Construction Industry Development Regulations, for an 6 ME class of construction work; and <ul style="list-style-type: none"> • the employer is satisfied that such a contractor has the potential to develop and qualify to be registered in that higher grade as determined in accordance with the provisions of the CIDB Specification for Social and Economic Deliverables in Construction Works Contracts; and • the employer agrees to provide the financial, management or other support that is considered appropriate to enable the contractor to successfully execute that contract. <p>c) No clarification meeting will be required.</p>
F.2.10	<p>a) The Valued Added Tax (VAT) rate shall be 15% or as otherwise provided for by legislation.</p> <p>b) The successful Tenderer shall be required to produce a VAT invoice that shall only be prepared once measurements and valuations for work done in terms of the contract offer have been agreed with the Employers agent and a certificate of payment issued.</p> <p>Payment of VAT to previously non-VAT vendors shall be processed from the month in which the Tenderers liability with the South African Revenue Services is effective.</p>
F.2.11	<p>A Tender offer shall not be considered if alterations have been made to the forms of tender data or contract data (unless such alterations have been duly authenticated by the Tenderer) or if any particulars required therein have not been completed in all respects.</p>
F.2.12	<p>No alternative tender offers will be considered</p>
F.2.13.1	<p>The Tenderer may not make an offer for only part of the services as defined in the Scope of Work.</p>

Tender data contd.

Sub-clause	Data																				
F.2.13.3	Parts of each tender offer communicated on paper shall be submitted as original, plus 0 copies. Under no circumstances whatsoever may the tender forms be retyped or redrafted.																				
F.2.13.5	The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package is: Municipal Building, 10 Fichardt Street, Sasolburg Location of tender box: As mentioned on the tender advertisement																				
F.2.15	The closing time for submission of Tender Offers is: 11:00 Hrs on 31 March 2023 Telephonic, telegraphic, telex, electronic or emailed tenders will not be accepted.																				
F.2.16	The tender offer validity period is 90 days																				
F.2.23	<table border="1"> <thead> <tr> <th colspan="2">Returnables</th></tr> <tr> <th>RETURNABLES</th><th>NOTES</th></tr> </thead> <tbody> <tr> <td>Form of Offer</td><td> <ul style="list-style-type: none"> Fully completed in handwriting and signed in black ink pen. </td></tr> <tr> <td>A copy of a CSD summary report OR CSD number.</td><td> <ul style="list-style-type: none"> CSD full report or summary report OR CSD number. Municipality may not make any award to a person whose tax matters are not complaint with SARS, please note that tax compliance will be verified before any award. </td></tr> <tr> <td>Proof of company registration documents with the Director's details must be attached.</td><td> <ul style="list-style-type: none"> The company registration documents must indicate the company and Director's details. In a case where the Director has changed names, proof of name change must be attached. </td></tr> <tr> <td>Fully completed and signed MBD forms</td><td> <ul style="list-style-type: none"> Fully Completed and signed in handwriting and in black ink pen. </td></tr> <tr> <td>Fully completed Bill Of Quantity (BOQ)</td><td> <ul style="list-style-type: none"> Fully completed in handwriting and in black ink pen </td></tr> <tr> <td>Fully Completed and signed MBD 5 form for Bidders quoted over R10 Million (Submitted Annual Financial Statements must clearly stating that they are Audited, Reviewed AFS won't be expected)</td><td> <ul style="list-style-type: none"> If required by law submit Audited Financial Statements for the past 3 years or since the date of establishment if established within the past 3 years. Audited Financial Statements signed by the CA/RA/PR Accountant & Director of the company (MBD 5 form) </td></tr> <tr> <td>Joint Venture Agreement (Must indicate the lead partner, if the bidders grading is not the same the lead partner must have the higher grading)</td><td> <ul style="list-style-type: none"> If applicable submit a complete and signed JV agreement. JV agreement stating who the lead partner is with the shared percentages. Note: JV agreement must be as per CIDB regulation of 2001 regulation 25 (5)(a),(b) and (6) </td></tr> <tr> <td>Latest Municipal rates and taxes account for the COMPANY AND DIRECTORS/TRUSTEES/</td><td> <ul style="list-style-type: none"> Submit strictly February 2023 or March 2023 municipal rates & taxes statement must be attached The submitted account must not be in arrears for </td></tr> </tbody> </table>	Returnables		RETURNABLES	NOTES	Form of Offer	<ul style="list-style-type: none"> Fully completed in handwriting and signed in black ink pen. 	A copy of a CSD summary report OR CSD number.	<ul style="list-style-type: none"> CSD full report or summary report OR CSD number. Municipality may not make any award to a person whose tax matters are not complaint with SARS, please note that tax compliance will be verified before any award. 	Proof of company registration documents with the Director's details must be attached.	<ul style="list-style-type: none"> The company registration documents must indicate the company and Director's details. In a case where the Director has changed names, proof of name change must be attached. 	Fully completed and signed MBD forms	<ul style="list-style-type: none"> Fully Completed and signed in handwriting and in black ink pen. 	Fully completed Bill Of Quantity (BOQ)	<ul style="list-style-type: none"> Fully completed in handwriting and in black ink pen 	Fully Completed and signed MBD 5 form for Bidders quoted over R10 Million (Submitted Annual Financial Statements must clearly stating that they are Audited, Reviewed AFS won't be expected)	<ul style="list-style-type: none"> If required by law submit Audited Financial Statements for the past 3 years or since the date of establishment if established within the past 3 years. Audited Financial Statements signed by the CA/RA/PR Accountant & Director of the company (MBD 5 form) 	Joint Venture Agreement (Must indicate the lead partner, if the bidders grading is not the same the lead partner must have the higher grading)	<ul style="list-style-type: none"> If applicable submit a complete and signed JV agreement. JV agreement stating who the lead partner is with the shared percentages. Note: JV agreement must be as per CIDB regulation of 2001 regulation 25 (5)(a),(b) and (6) 	Latest Municipal rates and taxes account for the COMPANY AND DIRECTORS/TRUSTEES/	<ul style="list-style-type: none"> Submit strictly February 2023 or March 2023 municipal rates & taxes statement must be attached The submitted account must not be in arrears for
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	MEMBERS/ SHAREHOLDERS.	<p>more than 3 months.</p> <ul style="list-style-type: none"> In a case of Rates & Taxes Account being in a family member's name, ONLY MUNICIPAL Account where the address of the Account matches the address on the company registration documents will be accepted) if not in arrears for more than 3 months.
	In the event of a tenant renting a lease agreement MUST be attached for the COMPANY AND DIRECTORS/TRUSTEES/ MEMBERS/ SHAREHOLDERS.	<p>The lease agreement must include the following:</p> <ul style="list-style-type: none"> A valid copy of the lease agreement must be signed by (both Lessor and lessee). The lease agreement must indicate dates of commencement and expiry or duration. In a case where the lease agreement has expired and there is a clause indicating an automatic renewal the original lease agreement and a confirmation letter signed by Lessor must be attached. In the occasion where the lease agreement has expired the original lease agreement AND extension must be attached with commencement and expiry dates or duration. In a case of lease agreement being in a family member's name, the lease agreement will be accepted if the address on the lease matches the address on the company registration documents, AND ONLY if the lease agreement is valid.
	<i>Note: If the company registration document's physical address on lease agreement or the municipal rates and taxes statement is the same as the Director's physical address, we will accept for both Company & Director.</i>	
	Municipal rates and taxes for bidders who are from the rural areas for the COMPANY AND DIRECTORS/TRUSTEES/ MEMBERS/ SHAREHOLDERS.	<ul style="list-style-type: none"> In the event that the bidder is from the rural area a letter from the municipality that the area is not liable to pay municipal rates and taxes OR a signed letter from the chief indicating that the bidder is from that particular rural/tribal area.
	CIDB Grading	<ul style="list-style-type: none"> Copy of Company CIDB Grading designation 6 ME or Higher
	<p><u>Failure to comply with the above mentioned terms and conditions will deem your bid to be disqualified.</u></p> <p><u>Bidders must keep a copy of a completed excel spreadsheet BOQ which may be required during the evaluation processes</u></p>	
	<p>Functionality Returnable</p> <p>1 Completion certificates of similar projects 2 Company Equipment and registrations 3 Key Staff / Personnel CV 4 Financial Stability</p>	
F.3.4	Opening of Tender Submissions	

F.3.4.2	Tenders will be opened in public soon after closing time and recording of received documents but not later than 11:00 at the Tender office. Tenderers' names and total prices where practical will be read out														
F.3.5	A two-envelope procedure will not be followed														
F.3.8.2	The Employer shall reject a non-responsive tender offer and not allow it to be subsequently made responsive by correction or withdrawal of non-conforming deviation or reservation.														
F.3.11	<p>Tenders will be evaluated for Functionality. Tenderers who qualify for Functionality will be evaluated further for Price and Preference only. Points for Functionality will not contribute to further evaluation. Tenderers who do not qualify will not be evaluated further. Functionality will be scored out of 100 points. A Tenderer who scores less than 75 points will automatically be disqualified.</p> <p>The 80/20 evaluation criteria will be used where Price will be allocated 80 points and Preference will be scored out of 20 points.</p>														
F.3.11.1	The procedure for evaluation of responsive Tender Offers will be Method 4: Financial Offer, Functionality and Preferences. The responsive tender with the highest total points as defined below is the preferred tender														
F.3.11.2	<p>The financial offer will be scored in terms of Formula 2, Option 1 of Table F.1 of SANS 294:2004, which reads as follows:</p> $Nfo = W1 \times A$ <p>Where: Nfo = number of tender evaluation points awarded for the financial offer;</p> <p>W180 points for rand value less than R50 000 000;</p>														
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A. PROJECT EXPERIENCE AND PERFORMANCE	40														
B. CONSTRUCTION PLANT	35														
C. COMPANY KEY PERSONNEL	15														
D. FINANCIAL STABILITY	10														
Total	100														
Minimum Threshold	75														

Criteria	Evaluation Indicators	Points Allocated	Weight
A. PROJECT EXPERIENCE AND PERFORMANCE			MAX. 40 POINTS
Company experience with regards to Water/ Sewer pump station projects	<p>Required submission to claim points:</p> <p>1. Project signed Appointment letter (letter must be within the past 10 years and the value of the project must be above R6 000 000.00) & corresponding reference letter or Completion certificate/ letter as a main contractor.</p> <p>2. A minimum of one project must be submitted from a State/Government/ SOE. Non-submission of a state project will render any submission for experience as nonresponsive and Zero (00) point will be allocated for Company experience.</p>	10 points per project	40
B. COMPANY EQUIPMENT			MAX. 35 POINTS
Ownership of Mechanical/ Electrical workshop. For equipment to be hired attach rental confirmation	<p>Attach list confirming workshop equipped with the following tools and equipment, but is not limited to,</p> <p>3-phase electrical power, standby generator power, welding equipment, adequate tools and material manufacturing equipment, work benches and the necessary lifting equipment to safely handle the mechanical and electrical equipment.</p>	<p>15 points if owned</p> <p>10 points if rented</p>	Max 15 Points
OHS Compliance	Attach Letter/ Certificate confirming Workshop complies with OHS ACT	10 points	Max 10 points
4 Ton Truck or higher	Vehicle Registration Certificates in a company or directors name/ Signed letter from Rental Company on rental company letterhead	<p>10 points if owned</p> <p>05 point if rented</p>	Max 10 Points
C. COMPANY KEY PERSONNEL	BIDDERS MUST SUBMIT CVs OR COMPLETE ANNEXURE A TO CLAIM POINTS		MAX. 15 POINTS

Contracts Manager	Personnel 1- is required to attach a National Diploma qualification or higher in the Built environment/ Project management and have project construction experience. NB: Submit CV and Qualifications. If no CV is attached complete personnel form on ANNEXURE A To claim points	10 years or more	Max 5 points
Installation Manager	Personnel 2- National Diploma (Mechanical or Electrical Engineering) with minimum 10 years' experience NB: Submit CV and Qualifications. If no CV is attached complete personnel form on ANNEXURE A To claim points	10 years or more	Max 4 points
Mechanical Fitter	Qualifications in Mechanical with minimum 8 years experience NB: Submit CV and Qualifications. If no CV is attached complete personnel form on ANNEXURE A To claim points	8 Years or more	Max 3 points
Electrician	Minimum 8 years' experience in MV and LV, with WIREMAN'S LICENSE NB: Submit CV and Qualifications. If no CV is attached complete personnel form on ANNEXURE A To claim points	8 Years or more	Max 3 points
D. FINANCIAL STABILITY			MAX 10 POINTS
Bank Rating Letter	Submit bank rating letter not older than 3 months of rating of A, B or C	10 Points	Max 10 POINTS
MINIMUM SCORE			75
TOTAL			100

In order to qualify for the second round of evaluation the tenders must score a minimum of 75 functionality points.

For points calculation, submit the following:

RETURNABLE	NOTES
BBBE Certificate or Affidavit	Valid Certified copy of SANAS only accredited BBEE certificate OR valid copy of BBEE Sworn Affidavit must be attached.

The recommended bidders company personnel and completed projects may be verified before appointments can be finalised. Misrepresentation of information will lead to the disqualification of the bidder.

NB: THE MUNICIPALITY RESERVES THE RIGHT TO VERIFY THE SUBMITTED FUNCTIONALITY DOCUMENTS

Tender data contd.

Sub-clause	Data
F.3.13	Acceptance of Tender Offer
F.3.13.1	<p>Tender offers will only be accepted if:</p> <ul style="list-style-type: none"> a) the tenderer is registered on the Central Supplier Database (CSD) for the South African government (see https://secure.csd.gov.za/) b) the tenderer is in good standing with SARS according to the Central Supplier Database; c) the tenderer submits a letter of intent from an approved insurer undertaking to provide the Performance Bond to the format included in Part C1.3 of this procurement document d) the tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation; e) the tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; f) the tenderer has not: <ul style="list-style-type: none"> i. abused the Employer's Supply Chain Management System; or ii. failed to perform on any previous contract and has been given a written notice to this effect; g) the tenderer has completed the Compulsory Declaration and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process; h) the tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer; i) the employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely.
F.3.17	The number of paper copies of signed contract to be provided by the Engineer is one (1).

ANNEXURE A-Site Agent

NB: Attach: Copy of qualification (Failure to fully complete may lead to no point scoring for functionality)

Name & Surname	ID/Passport Number	Highest Qualification	Employer & Contact reference No.	Project	Project Duration (Year)

ANNEXURE A-Foreman

NB: Attach: NON (Failure to fully complete may lead to no point scoring for functionality)

Name & Surname	ID/Passport Number	Highest Qualification	Employer & Contact reference No.	Project	Project Duration (Year)

ANNEXURE A- SAFETY OFFICER

NB: Attach copy of qualification (Failure to fully complete may lead to no point scoring for functionality)

Name & Surname	ID/Passport Number	Highest Qualification	Employer & Contact Reference No.	Project	Project Duration (Year)



METSIMAHOLO LOCAL MUNICIPALITY

BID NO: MLM 21/2022/23

UPGRADING OF SASOLBURG WATER PUMP STATION

PART T2 : RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS

The Tender Document must be submitted as a whole. All forms must be properly completed as required, and the document shall not be taken apart or altered in any way whatsoever.

All the certificates and forms to be provided with the tender are listed in the Tender Data under F2.23: Certificates, and under the returnable schedules and forms in T2.2 hereafter.

The list of returnable documents comprises the following:

1. All the certificates listed in the Tender Data under F2.23: Certificates;
2. All the returnable schedules and forms listed in T2.2.1: Returnable Schedules Required for Tender Evaluation Purposes;
3. All the returnable documents listed in T2.2.2: Preferential Procurement Schedules and Affidavits that will be incorporated into the Contract;
4. All the agreements and forms listed in T2.2.3: Forms to be completed by Successful Tenderer;
5. All the forms and agreements in the Contract Data in C1.2, where some of the forms (agreements) need to be completed only by successful Tenderer;
6. Pricing Data in C2.2: Bill of Quantities.

T2.2 RETURNABLE SCHEDULES

NOTE: The Tenderer is required to complete each and every schedule and form listed above to the best of his ability, as the evaluation of tenders and the eventual contract will be based on the information provided by the Tenderer. Failure of a Tenderer to complete the schedules and forms to the satisfaction of the Employer will inevitably prejudice the tender and may lead to rejection on the grounds that the tender is not responsive.

SCHEDULE A: MUNICIPAL BIDDING DOCUMENTS

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PART A
INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE METSIMAHOLO LOCAL MUNICIPALITY					
BID NUMBER	MLM 21/2022/23	CLOSING DATE:	31 March 2023	CLOSING TIME	11H00
DESCRIPTION	UPGRADING OF SASOLBURG WATER PUMP STATION				
THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT (MBD7).					
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN					
BOX SITUATED AT (STREET ADDRESS)					
Metsimaholo Local Municipality					
No 10 Fichardt Street					
Finance Building					
Ground Floor					
SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
TAX COMPLIANCE STATUS	TCS PIN		OR	CSD No:	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	<input type="checkbox"/> Yes		B-BBEE STATUS LEVEL SWORN		<input type="checkbox"/> Yes <input type="checkbox"/> No

[TICK APPLICABLE BOX]	<input type="checkbox"/> No	AFFIDAVIT	
[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?	<input type="checkbox"/> Yes No <input type="checkbox"/> [IF YES ENCLOSE PROOF]	ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES, ANSWER PART B:3]
TOTAL NUMBER OF ITEMS OFFERED		N/A	N/A
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		CONTACT PERSON	MR S BILA
CONTACT PERSON		TELEPHONE NUMBER	016 973 8487
TELEPHONE NUMBER		FACSIMILE NUMBER	
FACSIMILE NUMBER		E-MAIL ADDRESS	sibusiso.bila@metsimaholo.gov.za
E-MAIL ADDRESS			

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, 2017, 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)? <input type="checkbox"/> YES <input type="checkbox"/> NO 3.2. DOES THE ENTITY HAVE A BRANCH IN THE RSA? <input type="checkbox"/> YES <input type="checkbox"/> NO 3.3. DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA? <input type="checkbox"/> YES <input type="checkbox"/> NO 3.4. DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA? <input type="checkbox"/> YES <input type="checkbox"/> NO 3.5. IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION? <input type="checkbox"/> YES <input type="checkbox"/> NO IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 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:

DECLARATION OF INTEREST

1. No bid will be accepted from persons in the service of the state¹.
2. Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.

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

3.1 Full Name of bidder or his or her representative:

3.2 Identity Number:

3.3 Position occupied in the Company (director, trustee, hareholder²):

3.4 Company Registration Number:

3.5 Tax Reference Number:

3.6 VAT Registration Number:

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

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

3.8.1 If yes, furnish particulars.

.....

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

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

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

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

3.9.1 If yes, furnish particulars.....

.....

3.10 Do you have any relationship (family, friend, other) with persons?

in the service of the state and who may be involved with the evaluation and or

adjudication of this bid? YES / NO

3.10.1 If yes, furnish particulars.

.....

.....

3.11 Are you, aware of any relationship (family, friend, other) between any other bidder

and any persons in the service of the state who may be involved with the evaluation

and or adjudication of this bid.....YES / NO

3.11.1 If yes, furnish particulars

.....

.....

3.12 Are any of the company's directors, trustees, managers, principle shareholders or

stakeholders in service of the state.....YES / NO

3.12.1 If yes, furnish particulars.

.....

.....

3.13 Are any spouse, child or parent of the company's directors, trustees, managers,

principle shareholders or stakeholders in service of the state? YES / NO

3.13.1 If yes, furnish particulars.

.....

.....

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

3.14.1 If yes, furnish particulars:

.....

Full details of directors / trustees / members / shareholders.

Full Name	Identity Number	State Number	Employee

.....
Signature

.....
Date

.....
Capacity

.....
Name of Bidder

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

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

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

***YES / NO**

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

.....
.....

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

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

2.2 If yes, provide particulars.

.....
.....

* Delete if not applicable

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

- 3.1 If yes, furnish particulars

.....
.....

4. Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic?

***YES / NO**

4.1 If yes, furnish particulars

.....

.....

CERTIFICATION

I, **THE** **UNDERSIGNED** **(NAME)**

.....

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

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

FALSE.

.....

Signature

Date

.....

Position

.....

Name of Bidder

MBD 6.1

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022

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

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

1. GENERAL CONDITIONS

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

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

1.2 To be completed by the organ of state

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

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

Where

- Ps = Points scored for price of tender under consideration
- Pt = Price of tender under consideration
- Pmin = Price of lowest acceptable tender

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

3.2.1. POINTS AWARDED FOR PRICE

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

$$P_s = 80 \left(1 + \frac{P_t - P_{max}}{P_{max}} \right) \quad \text{or} \quad P_s = 90 \left(1 + \frac{P_t - P_{max}}{P_{max}} \right)$$

Where

P_s = Points scored for price of tender under consideration
 P_t = Price of tender under consideration
 P_{max} = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

- 4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:
- 4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—
- (a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or
 - (b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,
- then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

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

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

The specific goals allocated points in terms of this tender	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (80/20 system) (To be completed by the tenderer)
BBBEE	80/20	

Black economic empowerment in terms of the B-BBEE

Points will be allocated in terms of the B-BBEE scorecard as follows: B-BBEE Status Level of Contributor	Number of points (90/10 system)	Number of points (80/20 system)
1	10	20
2	9	18
3	8	16
4	5	12
5	4	8
6	3	6
7	2	4
8	1	2
Non-compliant contributor	0	0

A bidder must submit proof of its B-BBEE status level contributor [scorecard] or B-BBEE sworn affidavit

Proof of B-BBEE status level of contributor

- the B-BBEE status level certificate issued by an authorised body or person
- a sworn affidavit as prescribed by the B-BBEE Codes of Good Practice; or
- any other requirement prescribed in terms of the Broad-Based Black Economic Empowerment Act.

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm.....

4.4. Company registration number:

4.5. TYPE OF COMPANY/ FIRM

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

[TICK APPLICABLE BOX]

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

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
- iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –

- (a) disqualify the person from the tendering process;
- (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
- (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
- (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
- (e) forward the matter for criminal prosecution, if deemed necessary.

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

SURNAME AND NAME:

DATE:

ADDRESS:

.....

.....

.....

MBD 8

DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

- 1 This Municipal Bidding Document must form part of all bids invited.
- 2 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.
- 3 The bid of any bidder may be rejected if that bidder, or any of its directors have:
 - a. abused the municipality's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;
 - b. been convicted for fraud or corruption during the past five years;
 - c. willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
 - d. been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).
- 4 **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**

Item	Question	Yes	No
4.1	<p>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?</p> <p>(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 <i>audi alteram partem</i> rule was applied).</p> <p>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.</p>	<p>Yes</p> <input type="checkbox"/>	<p>No</p> <input type="checkbox"/>
4.1.1	<p>If so, furnish particulars:</p> 		

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 <input type="checkbox"/>	No <input type="checkbox"/>
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 <input type="checkbox"/>	No <input type="checkbox"/>
4.3.1	If so, furnish particulars:		
Item	Question	Yes	No
4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
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 <input type="checkbox"/>	No <input type="checkbox"/>

4.7.1	If so, furnish particulars:
-------	-----------------------------

CERTIFICATION

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

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

.....

Signature

.....

Date

.....

Position

.....

Name of Bidder

MBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

- 1 This Municipal Bidding Document (MBD) must form part of all bids¹ 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. takes all reasonable steps to prevent such abuse;
 - b. rejects the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
 - c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.
- 4 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.
- 5 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid:

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

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

MBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

(Bid Number and Description)

in response to the invitation for the bid made by:

(Name of Municipality / Municipal Entity)

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

I certify, on behalf

Of: _____ that:

(Name of Bidder)

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

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

MBD 9

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 consortium³ will not be construed as collusive bidding.
7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - (a) prices;
 - (b) geographical area where product or service will be rendered (market allocation)
 - (c) methods, factors or formulas used to calculate prices;
 - (d) the intention or decision to submit or not to submit, a bid;
 - (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
 - (f) bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

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.

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

SCHEDULE B: RECORD OF ADDENDA TO TENDER DOCUMENTS

I / We confirm that the following communication/s, amending the tender documents, received from the Employer or his representative before the closing date for submission of this tender offer, have been taken into account in this tender offer.

ADD. No	DATE	TITLE OR DETAILS
1		
2		
3		
4		
5		
6		
7		
8		

SIGNATURE:

SCHEDULE C: CERTIFICATE OF AUTHORITY

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

Managing Director:

(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 this tender and any contract resulting from it, on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

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

(iii) CERTIFICATE FOR PARTNERSHIP

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

.....

hereby authorize Mr/Ms acting in the capacity of to sign all documents in connection with this tender and any contract resulting from it, on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

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

(iv) CERTIFICATE FOR JOINT VENTURE

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 this tender offer 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.

NAME OF FIRM	ADDRESS	AUTHORIZING SIGNATURE, NAME AND CAPACITY
(Lead partner)		

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

(v) CERTIFICATE FOR SOLE PROPRIETOR

I,, hereby confirm that I am the sole owner of the
business trading as

Signature of Sole owner:

REGISTRATION CERTIFICATE / AGREEMENT / ID DOCUMENT***Important note to Tenderer:***

Registration Certificates for Companies, Close Corporations and Partnerships, or Agreements and Powers of Attorney for Joint Ventures, or ID documents for Sole Proprietors, all as referred to in the foregoing forms and in T2.1, must form part of this submission either separately as separate bunch of supporting documents or at the end of the this bid document and must be properly referenced.

SCHEDULE D: COMPULSORY ENTERPRISE QUESTIONNAIRE

The following particulars must be furnished. **In the case of a Joint Venture, separate enterprise questionnaires in respect of each partner must be completed and submitted. The questionnaires for the other partners must be inserted after this questionnaire.**

Section 1: Name of enterprise:

Section 2: VAT registration number:

Section 3: CIDB registration number:.....

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

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

Section 5: Particulars of companies and close corporations

Company registration number

Close corporation number

Tax reference number

Section 6: Record of service of the state

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

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

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

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

Insert separate page if necessary

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

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

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

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

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

Insert separate page if necessary

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

- i) confirms that neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;
- ii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;
- iii) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the Tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest;
- iv) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed _____ Date _____

Name _____ Position _____

Enterprise Name _____



METSIMAHOLO LOCAL MUNICIPALITY

BID NO MLM 21/2022/23

UPGRADING OF SASOLBURG WATER PUMP STATION

THE CONTRACT

- PART C1 : AGREEMENTS AND CONTRACT DATA**
- PART C2 : PRICING DATA**
- PART C3 : SCOPE OF WORK**
- PART C4 : SITE INFORMATION**

PART 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 in respect of the following works:

BID NUMBER MLM 21/2022/23: UPGRADING OF SASOLBURG WATER PUMP STATION

The Tenderer, identified in the Offer signature block below, has examined the documents listed in the Tender Data and addenda thereto as listed in the 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:

R

(In words)

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:**

Cell phone number:

Witness:

Signature:

Name: (in capitals):

Date:

ACCEPTANCE

By signing this part of the Form of Offer and Acceptance, the Employer identified below accepts the Tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the Conditions of Contract as set out in the General and Special Conditions of Contract, and identified in the Contract Data. Acceptance of the Tenderer's Offer shall form an agreement between the Employer and the Tenderer upon the terms and conditions contained in this Agreement and in the Contract that is the subject of this Agreement.

The terms of the contract are contained in

Part 1 Agreement and Contract Data, (which includes this Agreement)

Part 2 Pricing Data, including the Bill of Quantities

Part 3 Scope of Work

Part 4 Site Information

and the schedules, forms, drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

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

The Tenderer shall deliver the Guarantee in terms of Clause 7 of the General Conditions of Contract 2004 within the period stated in the Contract Data, and he shall, immediately 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 other bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data, within 14 days of the date on which this Agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Tenderer receives the fully completed original 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.

Signature:

Name:

Capacity: Municipal Manager

For: METSIMAHOLO LOCAL MUNICIPALITY
10 FICHARDT STREET, SASOLBURG, 4800

Witness:Name:

Date:

SCHEDULE OF DEVIATIONS

The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Tender Data and the Conditions of Tender.

A Tenderer's covering letter will not necessarily 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.

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.

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

1. Subject:

Details:

2. Subject:

Details:

3. Subject:

Details:

4. Subject:

Details:

5. Subject:

Details:

6. Subject:

Details:

By the duly authorised representatives signing this Schedule of Deviations, the Employer and the Tenderer agree to and accept the foregoing Schedule of Deviations as the only deviations from and

amendments to the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Tenderer and the Employer during this process of offer and acceptance.

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

FOR THE TENDERER:**Signature:****Name:****Capacity:****Witness:..****Name:****Date:****FOR THE EMPLOYER:****Signature:****Name:****Capacity:****Witness:..****Name:****Date:**

C1.2 CONTRACT DATA

C1.2.1 CONDITIONS OF CONTRACT

GENERAL CONDITIONS OF CONTRACT

This Contract will be based on the "General Conditions of Contract for Construction Works –3Ed Edition 2015, Third print", issued by the South African Institution of Civil Engineering. (Short title: "General Conditions of Contract 2015").

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

CONTRACT SPECIFIC CONDITIONS

1. GENERAL

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

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

2. AMENDMENTS TO THE GENERAL CONDITIONS OF CONTRACT

CSC 1.1.25 DEFINITIONS, INTERPRETATIONS AND GENERAL PROVISIONS

Add the following definitions:

"Labour-based Construction" means the effective employment of appropriate technologies and labour-intensive construction methods on projects specifically designed to maximize the workforce with limited use of machines.

"Community" shall mean all persons deemed to reside in the immediate vicinity of the project.

"Materials Provided by Client (MPC)" shall mean the materials provided to the Contractor by the Client as set out later in the technical specifications, preamble to the BoQ and the BoQ.

CSC1.10 Add the following Sub-Clause 1.10:

Training will be provided by the employer through various training providers. Training will be theoretical and practical and will be conducted in class rooms and on site. No separate payment of any nature will be made to the contractor for attendance of training sessions by the contractor or the contractor's staff. The Construction Project Manager will program and manage all training to ensure limited disruption to the contractors and the overall project.

CSC 2.3 Specific Approval of the Employer required

The Engineer has to obtain specific approval or consent from the Employer for the decisions in the following clauses:

Clauses 6.2, 6.6, 3.2.1, 3.2.4, 4.7, 8.2.2.2, 6.3.2, 6.4.1.4, 5.8.1, 5.11.1, 5.11.3, 6.6.1, 2.2.3, 6.10, 6.11, 5.14.1, 5.16.1, 7.8.2.2, 5.7.3 and 7.8.2.

CSC 4.5 Compliance with applicable laws

CSC 4.5.2 Health and Safety

Add the following:

"The Occupational Health and Safety Act No. 85 and Amendment Act No 181 of 1993 and the Construction Regulations 2003 will in all respects be applicable to this contract."

CSC 6.6.2 Payment to subcontractor

Add the following:

"The above-mentioned procedure shall adhere to the **Preferential procurement regulations, 2011, pertaining to the Preferential Procurement Policy Framework Act, Act No. 5 of 2000, published by National Treasury on 1 December 2011** and to any prescribed regulations of the FREESTATE Provincial Government pertaining to procurement.

CSC 40 PROGRESS OF THE WORKS

Add the following to Sub-Clause 40.1 :

Delete the last sentence and add the following:

The contractor shall within 3 days of receipt of notification submit to the Engineer in writing the action(s) the contractor intends to take to expedite the rate of progress, and within 7 days of receipt of notification implement such steps. The contractor shall as part of his actions submit to the Engineer a detailed revised program accommodating the agreed steps to meet the Due Completion date.

CSC 49.6 GUARANTEE IN LIEU OF RETENTION

Add to all references to a "Bank" also "*or an accredited Insurance Company*"

Add the following sub-clause

CSC 46: CONTRACT PRICE ADJUSTMENT SCHEDULE

Paragraph 1

Adjust the definitions of "L", "P", "M" and "F" in the 4th to the 7th subparagraphs with the following:

Definition of "L":

Insert "(Consumer Price Index)" after "P0141.1" in the third line

Insert "(Consumer Price Index and Percentage Change according to Urban Area)" after "Table 21" in the third line

Definition of "P":

Insert "(Production Price Index)" after "P0142.1" in the second line

Insert "(Production Price Index for Selected Materials, item 'Civil Engineering Plant')" after "Table 16" in the second line

Definition of "M":

Insert "(Production Price Index)" after "P0142.1" in the second line

Insert "(Production Price Index for Materials used in Certain Industries, item 'Civil Engineering Plant')" after "Table 15" in the second line

Definition of "F": *Insert "(Production Price Index)" after "P0142.1" in the second line*

Insert "(Production Price Index for Selected Materials, item Diesel Oil – Coast and Witwatersrand)" after "Table 16" in the second line

[Note: The indices are obtainable in www.statssa.gov.za. The latest indices for L (certain urban areas only), P, M and F, are more readily obtainable in www.safcec.org.za under "CPAF Indices"]

Paragraph 2 : Assessment of Amount subject to Adjustment: *Add the following to the paragraph defining "E":*

"Where the amount is based on current costs de-escalated to the base month, or where daywork is calculated at rates tendered in a daywork schedule, the costs shall not be included in the value of "E".

C1.2.2 CONTRACT SPECIFIC DATA

General

This section contains the Contract Specifications Data referred to under Clause 1(1) of the General Conditions of Contract. Electrical and Mechanical Engineering Work (1985)

Should any requirements of the Specific Data conflict with the requirements of the General Conditions of Contract, then the requirements of the Specific Data shall prevail.

Clause

1 Definitions and interpretation

The “**Employer**” as defined under Clause 1(1) of the General Conditions shall be the METSIMAHOLO LOCAL MUNICIPALITY

MUNICIPAL BUILDING
10 FICHARDT
SASOLBURG
4800

The “**Engineer**” as defined under Clause 1(1)(d) of the General Conditions shall be PULE RAMASIMONG DEVELOPMENT CONSULTANT.

06 De La Harpe Street
Wilkoppies
KLERKSDORP
2570

Tel: + 27 18 462 1575

4.1 Language

English

4.2 Law

The governing law shall be that of the Republic of South Africa.

5.13.1 Penalty for delay

The penalty applicable to and be applied to the completion of the Permanent Works as may be specified in terms of the requirements of the Contract Data and Scope of Work.

R 5 000 per calendar day

Add the following at the end of Clause 5.13.1:

For non-compliance with submitting EPWP Reports And Labour sheets and ID's, the penalty will be as follows :

If the Contractor shall, in terms of Clause 4.10.2, fail to deliver the information (monthly EPWP Report and Labour sheets and ID's) timeously and adequately, the Contractor shall be liable to the Employer for the sum calculated by the Engineer as a penalty for every

calendar day which shall lapse between the monthly due date and the actual date of receiving such information.

The penalty shall be R 5000 per calendar day.

For non-compliance with OHS requirements, the penalty will be as follows :

Per occurrence – R 5000-00

Per day after the occurrence until satisfactory remedied in order to meet compliance - R 1000-00 per day

For non-compliance with Micro Enterprises (SMME) targets, the penalty will be as follows :

For non compliance with Local Labour targets, the penalty will be as follows :

Should the contractor fail to meet the minimum requirement of creating 10 employment opportunities on site for the duration of the contact, a penalty of 1,5 * the value of the amount of employment that was not created, calculated at R200-00 per day per person, will be calculated and imposed. This amount will be deducted from the Contractor's payment certificate.

7.1 Time for Completion

..... * (months). To be completed by Tenderer*.

9.1 Performance Board or Surety

10 % of Contract amount.

12.1 Programme

The limit for submission of programme – one week.

14.3 Electricity, water and gas

Contractor to arrange and pay for.

16.4 Limitation of liability

Contractor's liability shall not exceed 100 % of the Contract Sum.

The contractor's liability shall expire on the date of issue of the Final Certificate.

17.1 Insurance of Works

Amount of insurance during Defects Liability Period: 100 % of the Contract Sum.

17.2 Minimum Amount of Third Party Insurance

R1 000 000 for any single claim, number of claims unlimited.

20.6 Import permits and licenses

The Contractor shall obtain and provide all necessary import permits and licenses required.

31.1 Amount of Reduction for delay

R5 000,00 per Calendar Day of delay.

Maximum Reduction

15 % of Contract Price.

32.1 Bonus

No bonus will apply.

33.1 Defects liability period

12 Months with use of works assumed 24 hours per day.

33.4 Maximum permitted extension: **12 months**

34.1 Variations

The total variation shall not be more than 20 % of the Contract Sum for any single Contract.

37.3 Certificates and Payment

Payment certificates shall be paid within 28 days of submission of the approved invoice by the engineer to the PMU. 10 % Retention retained up to Completion Certificate.

Builders lien is not applicable in this contract.

40. Payment Conditions

For Mechanical and Electrical Work ninety-five percent (95 %) of the quoted price will be payable on completion of delivery, installation and commissioning. A further 5 % will be payable at the end of the defect liability period. For Civil and Structural Work payment up to the Completion Certificate will be @ 90 % of tendered rates with 10 % retention held back, 5 % retention paid on issue of Completion Certificate and 5 % after the Defects Liability period.

41.4 Payment in foreign currencies

No payment will be made in foreign currencies.

52.1 Changes in Cost and Legislation

(Labour, Materials and Transport)

Prices to be fixed if award is made within 90 days of closing of date of tender.

53.1 Customs and import duties

All customs and import duties shall be paid for by the Contractor.

.....
SIGNATURE

C1.2.3 DATA PROVIDED BY THE TENDERER

Clause 6.8.3 of the GCC 2015:

Special materials	Unit on which variation will be determined *	Rate or price for the base Month (Excl. VAT) **
Not applicable		

Notes:

- * Indicate whether the material will be delivered in bulk or in containers.
- ** The price for special materials is only the price for the material and does not include the cost of transport, labour or any other costs. When called upon to do so, the Tenderer shall substantiate the above prices with acceptable documentary evidence.

.....
SIGNATURE

C1.3 FORM OF GUARANTEE

BID NO MLM 21/2022/23

WHEREAS **METSIMAHOLO LOCAL MUNICIPALITY** (hereinafter referred to as the Employer") entered into, a Contract with:

.....
(hereinafter called "the Contactor") on the day of20.....,
for **UPGRADING OF SASOLBURG WATER PUMP STATION.**

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

AND WHEREAS has / have at the request of the Contractor, agreed to give such guarantee;

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

1. The Employer shall, without reference and / or notice to us, have complete liberty of action to act in any manner authorized and/or contemplated by the terms of the said Contract, and/or to agree to any modifications, variations, alterations, directions or extensions of the completion date of the works under the said Contract, and that its rights under this guarantee shall in no way be prejudiced nor our liability hereunder be affected by reason of any steps which the Employer may take under such Contract, or of any modification, variation, alterations of the completion date which the Employer may make, give, concede or agree to under the said Contract.
2. This guarantee shall be limited to the payment of a sum of money.
3. The Employer shall be entitled, without reference to us, to release any guarantee held by it, and to give time to or compound or make any other arrangement with the Contractor.
4. This guarantee shall remain in full force and effect until the issue of the Certificate of Completion in terms of the Contract, unless we are advised in writing by the Employer before the issue of the said Certificate of his intention to institute claims, and the particulars thereof, in which event this guarantee shall remain in full force and effect until all such claims have been paid or liquidated.
5. Our total liability hereunder shall not exceed the Guaranteed Sum of Rand (in words); R (in figures)
6. The Guarantor reserves the right to withdraw from this guarantee by depositing the Guaranteed Sum with the beneficiary, whereupon our liability hereunder shall cease.
7. We hereby choose our address for the serving of all notices for all purposes arising here from as

.....
.....
.....
.....



IN WITNESS WHEREOF this guarantee has been executed by us at
on this day of 20

Signature

Duly authorized to sign on behalf of

Address
.....
.....

As witnesses:

1

2

C1.4 ADJUDICATOR'S AGREEMENT

(Pro Forma only)

To be entered into when required

This agreement is made on the day of between:

. (name of company / organisation)

of

. (address) and

. (name of company / organization)

of

. (address)

(the Parties) and

. (name)

of

. (address)

(the Adjudicator).

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

. and known as.

and these disputes or differences shall be/have been* referred to adjudication in accordance with GCC 2004, Clause 58.3, and the Adjudicator may be / has been* requested to act.

* Delete as necessary

IT IS NOW AGREED as follows:

1. The adjudication shall be conducted in accordance with the rights and obligations of the Adjudicator and the Parties as set out in the Procedure as per Clause 58.3.1 of the GCC 04.
2. The Adjudicator hereby accepts the appointment and agrees to conduct the adjudication in accordance with the Procedure.
3. The Parties bind themselves jointly and severally to pay the Adjudicator's fees and expenses in accordance with the Procedure.
4. The Parties and the Adjudicator shall at all times maintain the confidentiality of the adjudication and shall endeavour to ensure that anyone acting on their behalf or through them will do likewise, save with the consent of the other Parties which consent shall not be unreasonably refused.
5. The Adjudicator shall inform the Parties if he intends to destroy the documents which have been sent to him in relation to the adjudication and he shall retain documents for a further period at the request of either Party.
6. The Adjudicator shall be paid at the hourly rate of R. in respect of all time spent upon, or in connection with, the adjudication including time spent travelling.
7. The Adjudicator shall be reimbursed in respect of all disbursements properly made including, but not restricted to:

- (a) Printing, reproduction and purchase of documents, drawings, maps, records and photographs.
 - (b) Telegrams, telex, faxes, and telephone calls.
 - (c) Postage and similar delivery charges.
 - (d) Travelling, hotel expenses and other similar disbursements.
 - (e) Room charges.
 - (f) Charges for legal or technical advice obtained in accordance with the Procedure.
8. The Adjudicator shall be paid an appointment fee of R This fee shall become payable in equal amounts by each Party within 14 days of the appointment of the Adjudicator, subject to an Invoice being provided. This fee will be deducted from the final statement of any sums which shall become payable under item 6 and/or item 7. If the final statement is less than the appointment fee the balance shall be refunded to the Parties.
9. The Adjudicator is/is not* currently registered for VAT.
10. Where the Adjudicator is registered for VAT it shall be charged additionally in accordance with the rates current at the date of invoice.
11. All payments, other than the appointment fee (item 8) shall become due 7 days after receipt of invoice, thereafter interest shall be payable at 5% per annum above the Reserve Bank base rate for every day the amount remains outstanding.

SIGNED

by: _____

Name:

who warrants that he / she is duly authorized to sign for and on behalf of the first Party in the presence of

Witness

Name: _____

Address: _____

Date: _____

SIGNED

by: _____

Name:

who warrants that he / she is duly authorized to sign for and on behalf of the second Party in the presence of

Witness:

Name _____

Address: _____

Date: _____

SIGNED

by: _____

Name:

the Adjudicator in the presence of

Witness:

Name: _____

Address: _____

Date: _____

* Delete as necessary



METSIMAHOLO LOCAL MUNICIPALITY

BID NO. MLM 21/2022/23

UPGRADING OF SASOLBURG WATER PUMP STATION

PART C2: PRICING DATA

C2.1 PRICING INSTRUCTIONS – CIVIL AND STRUCTURAL, MECHANICAL AND ELECTRICAL WORK

1. Measurement and payment shall be in accordance to SANS 1200.
2. The units of measurement described in the Bill of Quantities are metric units. Abbreviations used in the Bill of Quantities are as follows:

%	=	percent
h	=	hour
ha	=	hectare
kg	=	kilogram
kl	=	kiloliter
km	=	kilometer
km-pass	=	kilometer-pass
kPa	=	kilopascal
kW	=	kilowatt
ℓ	=	liter
m	=	meter
mm	=	millimeter
m ²	=	square meter
m ² -pass	=	square meter-pass
m ³	=	cubic meter
m ³ .km	=	cubic meter-kilometer
MN	=	mega newton
MN.m	=	mega newton-meter
MPa	=	megapascal
No.	=	number
Prov sum	=	Provisional Sum
PC sum	=	Prime Cost Sum
R/only	=	rate only
Sum	=	lump sum
t	=	ton (1000 kg)
W/day	=	work day
3. For the purpose of the Bill of Quantities, the following words shall have the meanings hereby assigned to them:

Unit:	The unit of measurement for each item of work as defined in the SANS 1200
Quantity:	The number of units of work for each item.
Rate:	The agreed payment per unit of measurement.
Amount:	The product of the quantity and the agreed rate for an item.
Lump sum:	An agreed amount for an item, the extent of which is described in the Bill of Quantities but the quantity of work of which is not measured in any units.
4. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.
5. It will be assumed that prices included in the Bill of Quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.stanza.org.za or www.iso.org for information on standards).

6. The prices and rates in the Bill of Quantities are fully inclusive prices for the work described under the items. Such prices and rates cover all costs and expenses that may be required in and for the execution of the Works described in accordance with the provisions of the Scope of Work, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the Contract Data, as well as overhead charges and profit. These prices will be used as a basis for assessment of payment for additional work that may have to be carried out.
7. Where the Scope of Work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amounts tendered under such items.
8. An item against which no price is entered will be considered to be covered by the other prices or rates in the Bill of Quantities. A single lump sum will apply should a number of items be grouped together for pricing purposes.
9. The quantities set out in the Bill of Quantities are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in the Bill of Quantities.
10. The short descriptions of the items of payment given in the Bill of Quantities are only for the purposes of identifying the items. More details regarding the extent of the work entailed under each item appear in the Scope of Work.
11. The item numbers appearing in the Bill of Quantities refer to the corresponding item numbers in the "SANS 1200 as prepared by South African National Roads Agency Limited" and additional Project Specifications as per the Scope of Work.
12. Those parts of the contract to be constructed using labour-intensive methods have been marked in the Bill of Quantities with the letters LI in a separate column filled in against every item so designated. The works, or parts of the Works so designated are to be constructed using labour-intensive methods only. The use of plant to provide such Works, other than plant specifically provided for in the Scope of Work, is a variation to the contract. The items marked with the letters LI are not necessarily an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any of the requirements in the generic labour intensive specification in the Scope of Works.
13. 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 unauthorized 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.
14. The General Conditions of Contract, the Contract Data, the Scope of Works (including the Standardized Specifications) and the Drawings shall be read in conjunction with the Bill of Quantities.
15. Bill of Quantities should be filled out in black ink and no correctional fluid will be used. Tenders not adhering to these requirements will not be considered.

C2.3

BILL OF QUANTITIES

Project no. : 21/2022/23						
<u>METSIMAHOLO LOCAL MUNICIPALITY</u>						
<u>BILL A: Upgrading of Sasolburg water pump station P & G,s</u>						
Item number	Payment reference	Item Description	Unit	Quantities	Rate	Amount Rands.cents
	SANS	Schedule 1				
	1200	Preliminary and general				
1.1		Fixed charge items				
1.1.1	A8.3.1	Contractual requirements affecting the Contractor	sum	1		
	A8.3.2	<u>The Contractor to provide the following items or as amended in the Tender Document :</u>				
1.1.2	PSAB 3.1	Name board (2 number) as specified in the Tender Document	sum	1		
1.1.3	PSA8.3.2.1	Furnished office for the Engineer's use	sum	1		
	PSAB3.2					
1.1.4	PSAB 5.5	Survey assistant as & when required by the Engineer	sum	1		
1.1.5	PSAB 5.6	Survey equipments as & when required by the Engineer	sum	1		
1.1.6	PSAB4	Telephone facilities for the Engineer	Prov	1	26,000.00	26,000.00
1.1.7	PSAB5.7	Personnel computer & digital camera	sum	1		
1.1.8	A8.3.2.2a	Offices & storage facilities for the Contractor	sum	1		
1.1.9	A8.3.2.2b	Workshops for the Contractor as required by The Contract	sum	1		
1.1.10	A8.3.2.2d	Living accommodations for the Contractor's personnel	sum	1		
1.1.11	A8.3.2.2e	Ablution & latrine facilities for the Contractor's personnel	sum	1		
1.1.12	A8.3.2.2f	Supply tools & equipment's as required by The Contract	sum	1		
1.1.13	A8.3.2.2g	Water, electricity & communications as required by The Contract	sum	1		
		<u>Other obligations by the Contractor :</u>				
1.1.14	A8.3.2.2h	Deal with <u>rain and/or ground water</u> in all type of excavations on site	sum	1		
		as described in SANS 1 200 A section 5.5				
1.1.15	A8.8.1	Establish access road to site where it is necessary	sum	1		

1.1.16	A8.3.3	Fixed charge obligations by the Contractor	sum	1		
1.1.17	A8.3.4	Removal of site establishment	sum	1		
1.2		Time related items				
1.2.1	A8.4.1	Contractual requirements on a monthly bases affecting the Contractor	sum	1		
		<u>The Contractor to maintain the following items or as amended in the</u>				
		<u>Tender Document - for the duration of the Contract :</u>				
1.2.2	A8.4.2.2	All facilities on the site for the Engineer & for the Contractor	sum	1		
		<u>Other obligations by the Contractor on a time bases for the duration</u>				
		<u>of the Contract :</u>				
1.2.3	A8.4.3	Full time supervision of the site as specified in the Tender Document	sum	1		
1.2.4	A8.4.4	Company & head office administration costs pertaining to the Contract	sum	1		
1.2.5	A8.4.5	Other time related obligations by the Contractor	sum	1		
1.3		Provisional sums by the Engineer				
1.3.1	PSA5.10.1	Provisional sum for various tests requested by the Engineer	Prov	1	200,000.00	200,000.00
1.3.2	A8.8.2	Provision for traffic control as requested by the Engineer	Prov	1	30,000.00	30,000.00
1.3.3	PSA5.10.1	Provisional sum for community involvement/CLO payment	Prov	1	120,000.00	120,000.00
13.4	PSA5.10.1	Provisional sum for Training of two (2) Students	Prov	1	100,000.00	100,000.00
1.3.5	A8.5b	Contractor's overhead and profit on Item 1.3.3	%			
SUB-TOTAL BILL A TO MAIN SUMMARY PAGE						

BILL B: MECHANICAL						
Ite	Pay Ref.	Description	Unit	Qt	Rate	Amount
1.		Distribution Pump Sets (Option 1)				
! The Contractor must include for the following; Design, G.A. drawings, manufacture/supply, deliver/store, install, commission, up-hold during the 12-month defects liability period and training, of the equipment listed below. All work and equipment must comply with the specifications forming part of the contract document.						
1.1		Design & G.A. Drawings.	Sum	1		
1.2		Supply/ Manufacture Of Pump Sets Complete.	Each	4		
1.3		Supply/ Manufacture of Pipe Work Sets Complete.	Each	4		
1.4		Install Pump Sets Complete.	Each	4		
1.5		Install Pipe Work Sets Complete.	Each	4		
1.6		Commission Pump & Pipe Work Sets.	Each	4		
		TOTAL CARRIED TO MECHANICAL SUMMARY PAGE				
2.		Distribution Pump Sets (Option 2)				
! The Contractor must include for the following; Design, G.A. drawings, manufacture/supply, deliver/store, install, commission, up-hold during the 12-month defects liability period and training, of the equipment listed below. All work and equipment must comply with the specifications forming part of the contract document.						
2.1		Design & G.A. Drawings.	Sum	1		Rate Only
2.2		Supply/ Manufacture of Pump Sets Complete.	Each	4		Rate Only
2.3		Supply/ Manufacture of Pipe Work Sets Complete.	Each	4		Rate Only

Ite	Pay Ref.	Description	Unit	Qt	Rate	Amount
2.4		Install Pump Sets Complete.	Each	4		Rate Only
2.5		Install Pipe Work Sets Complete.	Each	4		Rate Only
2.6		Commission Pump & Pipe Work Sets.	Each	4		Rate Only
		TOTAL CARRIED TO MECHANICAL SUMMARY PAGE				
3.		Suction Actuated Isolation Valves				
! The Contractor must include for the following; Design, G.A. drawings, manufacture/supply, deliver/store, install, commission, up-hold during the 12-month defects liability period and training, of the equipment listed below. All work and equipment must comply with the specifications forming part of the contract document.						
3.1		Design & G.A. Drawings.	Sum	1		
3.2		Supply/ Manufacture of Metal Seat Gate Valves Complete.	Each	4		
3.3		Supply/ Manufacture of Valve Actuator Complete.	Each	4		
3.4		Install Valves Complete.	Each	4		
3.5		Install Actuators Complete.	Each	4		
3.6		Commission Actuated Valves.	Each	4		
		TOTAL CARRIED TO MECHANICAL SUMMARY PAGE				

4.		Delivery Actuated Isolation Valves				
! The Contractor must include for the following; Design, G.A. drawings, manufacture/supply, deliver/store, install, commission, up-hold during the 12-month defects liability period and training, of the equipment listed below. All work and equipment must comply with the specifications forming part of the contract document.						
It	Pay Ref.	Description	Unit	Qt	Rate	Amount
4.1		Design & G.A. Drawings.	Sum	1		
4.2		Supply/ Manufacture of Metal Seat Gate Valves Complete.	Each	4		
4.3		Supply/ Manufacture of Valve Actuator Complete.	Each	4		
4.4		Install Valves Complete.	Each	4		
4.5		Install Actuators Complete.	Each	4		
4.6		Commission Actuated Valves.	Each	4		
		TOTAL CARRIED TO SUMMARY PAGE				
5.		Delivery Check Valves				
! The Contractor must include for the following; Design, G.A. drawings, manufacture/supply, deliver/store, install, commission, up-hold during the 12-month defects liability period and training, of the equipment listed below. All work and equipment must comply with the specifications forming part of the contract document.						
5.1		Design & G.A. Drawings.	Sum	1		
5.2		Supply/ Manufacture of Nozzle Check Valves Complete.	Each	4		
5.3		Install Valves Complete.	Each	4		
5.4		Commission Valves.	Each	4		
		TOTAL CARRIED TO MECHANICAL SUMMARY PAGE				

Ite	Pay Ref.	Description	Unit	Qt	Rate	Amount
6.		Drainage Pump Sets				
! The Contractor must include for the following; Design, G.A. drawings, manufacture/supply, deliver/store, install, commission, up-hold during the 12-month defects liability period and training, of the equipment listed below. All work and equipment must comply with the specifications forming part of the contract document.						
6.1		Design & G.A. Drawings.	Sum	1		
6.2		Supply/ Manufacture of Pump Sets Complete.	Each	2		
6.3		Supply/ Manufacture of Pipe Work Sets Complete.	Sum	1		
6.4		Install Pump Sets Complete.	Each	2		
6.5		Install Pipe Work Sets Complete.	Sum	1		
6.6		Commission Pump & Pipe Work Sets.	Sum	1		
		TOTAL CARRIED TO MECHANICAL SUMMARY PAGE				
7.		Ventilation				
! The Contractor must include for the following; Design, G.A. drawings, manufacture/supply, deliver/store, install, commission, up-hold during the 12-month defects liability period and training, of the equipment listed below. All work and equipment must comply with the specifications forming part of the contract document.						
7.1		Design & G.A. Drawings.	Sum	1		
7.2		Supply/ Manufacture of Ventilation System Complete.	Sum	1		
7.3		Install of Ventilation System Complete.	Sum	1		
7.4		Commission of Ventilation System Complete.	Sum	1		
		TOTAL CARRIED TO MECHANICAL SUMMARY PAGE				

8.		Lifting Equipment				
! The Contractor must include for the following; Design, G.A. drawings, manufacture/supply, deliver/store, install, commission, up-hold during the 12-month defects liability period and training, of the equipment listed below. All work and equipment must comply with the specifications forming part of the contract document.						
It	Pay Ref.	Description	Unit	Qt	Rate	Amount
8.1		Design & G.A. Drawings.	Sum	1		
8.2		Supply/ Manufacture of Electrical Hoists Complete.	Each	2		
8.3		Install of Electrical Hoists Complete.	Each	2		
8.4		Commission of Electrical Hoists Complete.	Each	2		
		TOTAL CARRIED TO MECHANICAL SUMMARY PAGE				
9.		Inflow Meter				
! The Contractor must include for the following; Design, G.A. drawings, manufacture/supply, deliver/store, install, commission, up-hold during the 12-month defects liability period and training, of the equipment listed below. All work and equipment must comply with the specifications forming part of the contract document.						
9.1		Design & G.A. Drawings.	Sum	1		
9.2		Supply/ Manufacture of Electromagnetic Flow Meter Complete.	Each	1		
9.3		Install of Electromagnetic Flow Meter Complete.	Each	1		
9.4		Commission of Electromagnetic Flow Meter Complete.	Each	1		
9.5		Provisional sum for modification to existing pipe work to fit flow meter.	PC Sum	1	550,000.00	550,000.00

Ite	Pay Ref.	Description	Unit	Qt	Rate	Amount
9.6		Provisional sum for modification to existing chamber to fit flow meter.	PC Sum	1	150,000.00	150,000.00
		TOTAL CARRIED TO MECHANICAL SUMMARY PAGE				

BILL B: Total Summary Page for Mechanical Works			
1	Distribution Pump Sets (Option 1)		R
2	Distribution Pump Sets (Option 2)		R
3	Suction Actuated Isolation Valves		R
4	Delivery Actuated Isolation Valves		R
5	Delivery Check Valves		R
6	Drainage Pump Sets		R
7	Ventilation		R
8	Lifting Equipment		R
9	Inflow Meter		
	SUB-TOTAL BILL B TO MAIN SUMMARY PAGE		R

BILL C: ELECTRICAL				
DISTRIBUTION TRANSFORMER				
Items	Description	Unit	Specified	Offered
			Minimum Requirements	To Be Completed By Contractor
1	Manufacturer		Stipulate	
2	Country of manufacture		Stipulate	
3	Delivery period	Weeks	Stipulate	
4	Number of units required	No	2	
5	Ambient temperature: Min/Max	°C	+5/+50	
6	Rating	kVA	500	
7	Nominal system voltage and rated voltage on principal tapping: MV/LV	kV rms	11/0.4	
8	Type		Outdoor	
9	Tank Type		Sealed	
10	Separate winding or auto-transformer		Separate winding	
11	Number of Phases		3	
12	Connection symbol (vector group) and neutral terminal		Dyn11	
13	Winding tapped		LV	
14	Parallel operation with other transformer matching impedance and tapings under same contract		Not Required	
15	System fault current level	kA	20	
16	Designed Short-circuit current: MV/LV	kA	20	
17	Impedance on principal tapping	%		
18	Tap-changer type (OLTC or OCTS)		OCTS	
19	Number of tapping positions (including transition positions)	No		
20	Lightning impulse insulation level (1,2/50 μ s full wave) of tap-changer	kV		
21	Zero sequence impedance measurement required		Not Required	
22	Automatic and remote control panels and equipment for the OLTC		Not Required	
23	Tap local/remote switch		Local	
24	Type of tap position indicator		Required	
25	LV outdoor bushing rated for voltage	kV	1	
26	Creepage distance for line terminals (min)	kV/mm	31	
27	Primary connections		185 mm ² x 3c Cu PILC / XLPE	
28	Secondary connections		2 x 630 mm ² x 1c Cu PVC	
29	Disconnecting chamber		Not required	
30	Drilling and bolting of flanges to comply with BS 4504 or DIN 2631		Required	
31	Welded main tank cover joint		Required	

Items	Description	Unit	Specified	Offered
32	Earthing connections to earth mat		Required	
33	Brackets for surge arresters		Not Required	
34	Bag in the main tank of the conservator		Not Required	
35	Remote temperature indication		Not Required	
36	Cooling		ONAN	
37	OLTC control to be wired to the marshalling box		Not Required	
38	Cables between the marshalling box and the control room		Not Required	
39	Built- current transformers		Not Required	
40	Winding-temperature thermometer(s)		Not Required	
41	Oil-temperature thermometer		Required	
42	Oil-actuated and gas-actuated relay		Not Required	
43	Pressure-relief device		Required	
44	Buchholz relay		Not Required	
45	Tap-changer protective device		Not Required	
46	Dehydrating breathers		Not Required	
47	Conservator bag		Not Required	
48	Oil filler plug		Required	
49	Oil-level indicators		Not Required	
50	Spares: 1 x MV bushing		Required	
51	Spares: 1 x LV bushing		Required	
52	Spares: 1 x cooling fan motor		Not Required	
53	Spares: 1 x three-phase set of diverter switch contacts		Not Required	
54	Spares: 1 x tap-changer drive motor		Not Required	
55	Spares: 1 x contactor of each type		Not Required	
56	Overall dimensions of tank: Width / Depth / Height	mm	Stipulate	
57	Height over MV bushings	mm	Stipulate	
58	Mass: Transport/Filled	kg	Stipulate	
59	Three-ply malthoid on plinth		Required	
60	Bushings type		Stipulate	
61	Training programme	Prov	Required	R 200 000.00
61.1	Contractor's overhead and profit on Item 61	%		
62	Drawings and manuals in an electronic medium		dwg & pdf format	
63	No-load loss on principal tapping at 1,00 Un	kW	Stipulate	
64	Load loss (I ² R + stray) at 75 °C and on principal tapping with LV unloaded:	kW	Stipulate	
65	Fans (total)	kW	Not Required	
66	Tolerance applicable to guaranteed impedances on principal tapping	%	Stipulate	
67	Maximum acoustic sound level	dB(A)	Stipulate	

99

BILL C: ELECTRICAL
VARIABLE FREQUENCY CONVERTERS

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	GENERAL			
1.1	Manufacturer			
1.2	Model			
1.3	Place of manufacture			
1.4	Expected life (for spares availability)	Years		
2	ELECTRICAL SERVICE CONDITIONS			
2.1	Normal service conditions varied in Project Specification	Yes/No	No	
2.2	Unusual electrical service conditions specified	Yes/No	No	
2.3	Supply network characteristics			
2.3.1	Voltage (nominal)	V	400	
2.3.2	Frequency	Hz	50	
2.3.3	Source impedance (at minimum fault level) at PCC	Ohms	TBC	
2.3.4	Fault level (maximum) at PCC	MVA	TBC	
2.3.5	Fault level (n-1 contingency/minimum) at PCC	MVA	TBC	
2.3.6	Voltage total harmonic distortion limit at PCC	%	1%	
2.4	VFC input current harmonic limits and actual			
2.4.1	5th	%		
2.4.2	7th	%		
2.4.3	11th	%		
2.4.4	13th	%		
2.4.5	17th	%		
2.4.6	19th	%		
2.4.7	23rd	%		
2.4.8	25th	%		
2.4.9	29th	%		
2.4.10	31st	%		

Items	Description	Unit	Specified	Offered
2.4.11	THD	%		
3	ENVIRONMENTAL SERVICE CONDITIONS			
3.1	Standard climatic conditions varied in Project	Yes/No	No	
3.2	Forced ventilation or air conditioning in VFC room	FV/AC	AC	
3.3	Unusual mechanical installation conditions specified	Yes/No	No	
3.4	Unusual environmental service conditions specified	Yes/No	No	
3.5	Airflow required per VFC	m³/s		
4	LOAD DETAILS			
4.1	Type of motor-driven load		Pump	
4.2	Load torque characteristic		Quadratic	
4.3	Number of operation quadrants		1	
4.4	Dynamic braking required		No	
4.5	Operating speed range		As per mechanical specification	
5	CONVERTER TRANSFORMER			
5.1	Type (oil-filled or dry)			
5.2	Number of secondary windings			
5.3	Primary rated voltage	V		
5.4	Secondary rated voltage	V		
5.5	Rated power	kVA		
5.6	Free-standing (FS) or integral (I) to VFC	FS/I		
5.7	No-load losses	W		
5.8	Load losses	W		

Items	Description	Unit	Specified	Offered
6	CONVERTER CONFIGURATION			
6.1	Form of converter (package/chassis/cabinet unit)		Package	
6.2	Rectifier type: diode- or active front end (DFE/AFE)		DFE	
6.3	Rectifier pulse number		6	
6.4	Bypass/redundancy arrangement specified	Yes/No	No	
6.5	Input air circuit-breaker	Yes/No	No	
6.6	Input switch-disconnector	Yes/No	No	
6.7	Input semi-conductor fuses	Yes/No	Yes	
6.8	Input contactor	Yes/No	Yes	
6.9	Input earthing switch	Yes/No	No	
7	CONVERTER FILTERS			
7.1	Line-side reactor	Yes/No	Yes	
7.2	Line-side reactor relative short-circuit voltage	%		
7.3	Line harmonic filters (LHF)	Yes/No		
7.4	LHF free-standing (FS) or integral to VFC (I)	FS/I		
7.5	Motor-side reactor	Yes/No		
7.6	Motor-side dv/dt filter	Yes/No		
7.7	Motor-side sine filter	Yes/No		
7.8	Motor-side common-mode filter	Yes/No		
8	CONVERTER PROTECTION			
8.1	Overcurrent and overload	Yes/No	Yes	
8.2	Undervoltage and overvoltage	Yes/No	Yes	
8.3	Phase loss and unbalance	Yes/No	Yes	
8.4	Earth fault	Yes/No	Yes	
8.5	Over-temperature	Yes/No	Yes	
8.6	DC link overvoltage and overcurrent	Yes/No	Yes	
8.7	Over-temperature of DC link reactor (if installed)	Yes/No	Yes	

Items	Description	Unit	Specified	Offered
9	MOTOR PROTECTION			Indicate if provided by VFC or MPR
9.1	Short-circuit	Yes/No	Yes	
9.2	Start(max starting time)/Stall	Yes/No	Yes	
9.3	Earth fault	Yes/No	Yes	
9.4	Overload	Yes/No	Yes	
9.5	Number of starts	Yes/No	Yes	
9.6	Loss of phase	Yes/No	Yes	
9.7	Unbalance	Yes/No	Yes	
9.8	Loss of load/undercurrent	Yes/No	Yes	
9.9	Thermal by means of motor thermistors/RTDs	Yes/No	Yes	
10	CONVERTER RATINGS			
10.1	Rated system voltage	V	400	
10.2	Line-side rated current	A		
10.3	Input total power factor	pu		
10.4	Line-side displacement power factor	pu		
10.5	Rated continuous output current	A		
10.6	Overload capability and time	A & s		
10.7	Efficiency of complete drive module	%		
10.8	Total losses of complete drive module	W		
11	CONTROL PERFORMANCE REQUIREMENTS			
11.1	Open loop speed control	Yes/No	Yes	
11.2	Steady state deviation band	%	±1 to ±2	
11.3	Closed loop speed control with indirect feedback	Yes/No	No	
11.4	Steady state deviation band	%		
11.5	Closed loop speed control with direct feedback	Yes/No	No	
11.6	Steady state deviation band	%		

Items	Description	Unit	Specified	Offered
12	PROCESS CONTROL INTERFACE			
12.1	Compliant with SANS 61800-7	No/Yes	Yes	
12.2	Communications Interface Quantity	No.		
12.3	Communications Interface Type(s) and Connector(s)	No.		
12.4	Communications Interface Protocol(s)	No.		
12.5	Communications Interface Power Drive System Profile	Process / Drive / Motion Control	Process	
12.6	Communications Interface Message Structure to SANS 61800-7		Yes	
13	SPECIAL CONTROL FEATURES			
13.1	Automatic restart facility	Yes/No	Yes	
13.2	Flying restart facility	Yes/No	Yes	
13.3	Adjustable ramp times (acceleration/deceleration)	Yes/No	Yes	
13.4	Dip ride-through using load kinetic energy	Yes/No	Yes	
14	TESTING			
	Where indicated the following tests shall be carried out in addition to the specified mandatory tests.			
14.1	Special Tests for Converter			
14.1.1	Overcurrent capability	Yes/No	No	
14.1.2	Measurement of ripple voltage and current	Yes/No	No	
14.1.3	Power factor measurement	Yes/No	No	
14.1.4	Measurement of inherent voltage regulation	Yes/No	No	
14.1.5	Audible noise	Yes/No	No	
14.1.6	Additional tests	Yes/No	No	
14.2	Drive System Site Tests			
14.2.1	Load duty	Yes/No	No	

Items	Description	Unit	Specified	Offered
14.2.2	Allowable full load current versus speed	Yes/No	No	
14.2.3	Temperature rise	Yes/No	No	
14.2.4	Efficiency	Yes/No	No	
14.2.5	Current sharing	Yes/No	No	
14.2.6	Voltage division	Yes/No	No	
14.2.7	Shaft current - bearing insulation	Yes/No	No	
14.2.8	Audible noise	Yes/No	No	
14.2.9	Motor vibration	Yes/No	No	
14.2.10	EMC tests	Yes/No	No	
14.2.11	Harmonic content of CDM output	Yes/No	No	
14.2.12	Current limit and current loop	Yes/No	No	
14.2.13	Speed loop	Yes/No	No	
14.2.14	Torque pulsation	Yes/No	No	
14.2.15	Automatic restart	Yes/No	No	
14.2.16	System full load test	Yes/No	No	
14.2.17	Overall drive system efficiency	Yes/No	No	
14.3	Witnessed factory acceptance test	Yes/No	No	
<p>Regardless of any information provided in this technical data sheet, the equipment to be provided will comply with the specified requirements</p>				
Name (Print):		Signature: .		

BILL C: ELECTRICAL				
PROGRAMMABLE LOGIC CONTROLLERS				
	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	PROGRAMMABLE LOGIC CONTROLLERS/Programmable RTU			
1.1	Manufacturer			
1.2	Model			
1.3	CPU			
1.4	CPU configuration			
1.5	Digital Inputs	No.		
1.6	Digital Outputs	No.		
1.7	Analogue Inputs	No.		
1.8	Analogue Outputs	No.		
1.9	Spare I/O	%	30%	
1.10	Ports			
1.10.1	Ethernet	No.		
1.10.2	Serial	No.		
1.10.3	Other	No.		
1.11	Software			
1.12	All engineering software included with PLC	Yes / No	Yes	
1.13	Annual Software License renewal required	Yes / No	No, should be once off fee	
1.14	Programming Language		IEC 61131	
2	REMOTE IO			
2.1	Manufacturer			
2.2	Model			
2.3	CPU			
2.4	CPU configuration			
2.5	Digital Inputs	No.		
2.6	Digital Outputs	No.		
2.7	Analogue Inputs	No.		
2.8	Analogue Outputs	No.		
2.9	Spare I/O	%	30%	
2.10	Ports			
2.10.1	Ethernet	No.		
2.10.2	Serial	No.		
2.10.3	Other	No.		
3	PLC, RTU AND RIO PANELS			
3.1	Enclosure Material		as per MCC	
3.2	Enclosure Colour		as per MCC	
3.3	Enclosure Rating	IP	42	
3.4	Enclosure Mounting	Floor Standing / wall mounted	Floor Standing	
3.5	Supply and Control Circuit Voltages	V	24V DC	
3.6	Wire Colours		as per spec	
3.7	Glass door - viewing panel	Yes / No	Yes	

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
3.8	Termination			
3.9	Glanding			
3.10	Power Supply Unit vendor preferences			
3.11	Uninterruptible Power Supply requirement	Yes / No	Yes	
3.12	Panel light required	Yes / No	Yes, LED	
3.13	Socket outlet required	Yes / No	Yes	
3.14	Physical Spare space	%	30	
4	HUMAN MACHINE INTERFACE (HMI)			
4.1	Manufacturer			
4.2	Model			
4.3	Screen Size	Inches	15"	
4.4	Screen Type		Colour LCD Display, 18 bit	
4.5	Resolution	Pixels		
4.6	Touch Screen	Yes / No	Yes	
4.7	Type of Touch Screen	Capacitive / Resistive		
4.8	Enclosure Rating	IP	65	
4.9	Position of Installation	Panel / Flush Fronted / Front	Flush Fronted	
4.10	Software			
4.11	Datasheets included with tender	Yes / No	Yes	
5	UPS			
5.1	Manufacturer			
5.2	Model			
5.3	Place of manufacture			
5.4	Type		Industrial online double conversion with full static bypass	
5.5	Power	W	Load + 30%	
5.6	Backup Time	min	30	
5.7	Output Voltage	V	230V +-5%	
5.8	Nominal Frequency	Hz	50	
5.9	Output Waveform		Pure sine wave	
5.10	Number of Phases	1 or 3	1	
5.11	Communication		Serial/Ethernet	
5.12	Battery Life	Years	Min 10.	
5.13	Battery Type		Sealed, maintenance free, Lead acid contained in UPS	
5.14	Battery Charger			
5.15	Datasheets included with tender	Yes / No	Yes	

6	SUPPLEMENTARY DETAILS			

Regardless of any information provided in this technical data sheet, the equipment to be provided will comply with the specified requirements

Name (Print): _____ **Signature:** _____.

BILL C: ELECTRICAL				
LOW VOLTAGE SOFT STARTERS				
	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	MAKES AND MODELS			
1.1	Manufacturer			
1.2	Rated power up to 15 kW	kW		
1.3	Rated power over 15 kW up to 30 kW	kW		
1.4	Rated power over 30 kW up to 55 kW	kW		
1.5	Rated power over 55 kW	kW		
2	CHARACTERISTICS OF SOFT STARTERS			
2.1	Type of Equipment			
2.1.1	Two phase control allowed up to 15 kW	Yes/No	Yes	
2.1.2	Controlled phases fully controlled			
2.1.3	In-delta connection allowed	Yes/No	No	
2.2	Ratings			
2.2.1	Rated operational voltage	V	400	
2.2.2	Rated insulation voltage	V		
2.2.3	Rated impulse withstand voltage	kV		
2.2.4	Rated frequency	Hz	50	
2.3	Utilization category		AC-53a	
2.4	Protection Functions			
2.4.1	Overtemperature/thermal protection	Yes/No	Yes	
2.4.2	Electronic motor overload	Yes/No	Yes	
2.4.3	Phase loss	Yes/No	Yes	
2.4.4	Phase unbalance	Yes/No	Yes	
2.4.5	Phase sequence	Yes/No	Yes	
2.4.6	Overcurrent/short-circuit	Yes/No	Motors >55 kW	
2.4.7	Earth fault	Yes/No	Motors >55 kW	
2.4.8	Starts per hour	Yes/No	Motors >55 kW	
2.4.9	Stall (locked rotor under starting conditions)	Yes/No	Motors >55 kW	
2.4.10	Thermistor/RTD input	Yes/No	Motors >55 kW	
2.4.11	Underload (undercurrent)	Yes/No	Yes	
2.4.12	Over- and undervoltage	Yes/No	Yes	
2.4.13	Jam (locked rotor under running conditions)	Yes/No	Yes	
2.4.14	Type 2 co-ordination with upstream SCPD	Yes/No	Yes	
2.5	Control Settings			
2.5.1	Initial start voltage	Yes/No	Yes	
2.5.2	Start ramp time	Yes/No	Yes	
2.5.3	Motor full load current	Yes/No	Yes	
2.5.4	Current limit	Yes/No	Yes	
2.5.5	Kickstart (voltage/current boost)	Yes/No	Yes	
2.5.6	Torque control	Yes/No	Yes	

[illegible]

**BILL C: ELECTRICAL
CABLE SUPPORTS**

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	WIRE MESH TRAY			
1.1	Manufacturer			
1.2	Type			
1.3	Material		HDG indoors, Stainless Steel 316 Outdoors	
1.4	Duty	Heavy/ Medium	Medium	
1.5	Application			
2	CABLE LADDER			
2.1	Manufacturer			
2.2	Type			
2.3	Material		HDG indoors, Stainless Steel 316 Outdoors	
2.4	Duty	Heavy/ Medium	Heavy	
2.5	Application		MV and LV cables	
3	SUPPLEMENTARY DETAILS			

Regardless of any information provided in this technical data sheet, the equipment to be provided will comply with the specified requirements

Name (Print): _____ **Signature:** _____.

BILL C: ELECTRICAL
LV CABLES

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	LOW VOLTAGE CABLES			
1.1	Manufacturer			
1.2	Operating Voltage	V	600/1000	
1.3	Number of Cores	No	See Specificati onsand SLDs	
1.4	Size	mm ²		
1.5	Conductor Type	Cu/Al		
1.6	Cable Type			
1.7	Full Load Current	A		
1.8	Armouring	Yes/No	Yes, SWA or AWA for singlecore	
1.9	Depth of installation	mm (to cable centre)	650	
1.10	Outdoor Cable Markers	Yes/No	No	
2	SUPPLEMENTARY DETAILS			

Regardless of any information provided in this technical data sheet, the equipment to be provided will comply with the specified requirements

Name (Print): _____ **Signature:** _____.

BILL C: ELECTRICAL				
CONTROL, INSTRUMENTATION AND DATA CABLES				
	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	CONTROL CABLES			
1.1	Manufacturer			
1.2	Size	mm ²	1.5	
1.3	Operating Voltage	V	24VDC/230V AC	
1.4	Number of Cores	No	Refer to Instrumentation and Control cable schedule and drawings.	
1.5	Size	mm ²		
1.6	Conductor Type	Cu/Al		
1.7	Cable Type			
1.8	Full Load Current	A		
1.9	Armouring	Yes/No	Yes, SWA	
2	INSTRUMENTATION CABLES			
2.1	Manufacturer			
2.2	Operating Voltage	V	24VDC/230V AC	
2.3	Size	mm ²	1.5	
2.4	Cable Type		Twisted Pair	
2.5	Screened		Individually and Overall	
2.6	Armouring	Yes/No	Yes, SWA	
3	FIBRE OPTIC			N/A
3.1	Manufacturer			
3.2	Type		Multimode	
3.3	Armouring	Yes/No	Yes, for outdoor and exposed cables.	
3.4	Armouring Type		Steel Tape Armoured	
3.5	Termination preference type		ST	
3.6	Cores	No	min 12	
3.7	Cable Category		min OM 2	
3.8	Modal Bandwidth	MHz.km	min 500 / 500	
4	ETHERNET CABLES			
4.1	Manufacturer			
4.2	Type		CAT5 STP	
4.3	Armouring	Yes/No	No	
4.4	Termination Type		RJ 45 (Moulded case type)	

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
5	FIELD BUS CABLE			
5.1	Manufacturer			
5.2	Type		CAT5 STP	
5.3	Armouring	Yes/No	No	
5.4	Termination Type		RJ 45 (Moulded case type)	
6	SUPPLEMENTARY DETAILS			
Regardless of any information provided in this technical data sheet, the equipment to be provided will comply with the specified requirements.				
Name (Print): _____ Signature: _____.				

BILL C: ELECTRICAL				
LV ELECTRICAL MOTORS				
	DESCRIPTION	UNIT	SPECIFIED	OFFERED
1	ELECTRICAL OPERATING CONDITIONS			
1.1	Supply voltage (nominal)	V	400	
1.2	Number of phases		3	
1.3	Frequency	Hz	50	
1.4	Voltage and frequency variations	%	As per SANS 1804-2	
1.5	Supply voltage harmonic voltage factor		As per SANS 60034-1	
1.6	Supply voltage negative sequence component	%	2	
1.7	Supply neutral earthed directly/resistively (high/low)		Directly	
2	SITE OPERATING CONDITIONS			
2.1	Altitude a.s.l.	m	As per	
2.2	Maximum ambient temperature	°C	Specification	
2.3	Minimum ambient temperature	°C		
3	MOTOR RATING			
3.1	Rated output	kW	As per Specification	
3.2	Duty type		S1	
3.3	Output margin above load absorbed power	%	15	
3.4	Speed (synchronous)	rpm	1500	
3.5	Speed at rated output, voltage and frequency	rpm		
3.6	Rated voltage	V	400	
3.7	Full load current	A		
3.8	Efficiency class (IE1/2/3)		IE2	
3.9	Rated torque	Nm		
4	ENCLOSURE, CONSTRUCTION & MOUNTING			
4.1	Ingress protection rating		IP55, IP68 for submersible	
4.2	Cooling method		IC411	
4.3	Construction and mounting arrangement		IM B3	
4.4	Terminal box location (R/B/L/T)		as per Contractor's design	
4.5	Cable entry location		Below	
4.6	Cable type and size		As per SLD	
4.7	Corrosion protection (standard/corrosive environment)		Corrosive	
5	WINDINGS TYPE, INSULATION & TEMPERATURE RISE			
5.1	Stator winding type (random/formed diamond coil)		Formed	
5.2	Insulation and impregnation system		VPI	

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
5.3	Insulation thermal class	(F/H)	F	
5.4	Temperature rise class	(B/F)	B	
5.5	Maximum temperature rise at rated output (Zone K A supply)			
5.6	Maximum temperature rise at rated output (Zone K C supply)			
5.7	Windings thermal protection (thermistor/PT100)		Yes	
6	GENERAL PERFORMANCE			
6.1	Efficiency at rated output	%		
6.2	Efficiency at rated 75% output	%		
6.3	Efficiency at rated 50% output	%		
6.4	Power factor at rated output	pu		
6.5	Power factor at 75% rated output	pu		
6.6	Power factor at 50% rated output	pu		
6.7	Sound power level at rated load	dBA		
6.8	Silencer required		No	
7	STARTING PERFORMANCE			
7.1	Starting method		As per SLDs	
7.2	Motor moment of inertia	kg.m ²		
7.3	Number of starts per hour (cold/hot)		6/2	
7.4	Starting current (x full load current)	A		
7.5	Starting torque (x rated torque)	N m		
7.6	Pull-up torque (x rated torque)	N m		
7.7	Breakdown torque (x rated torque)	N m		
7.8	Starting power factor	pu		
7.9	Run up time of driven load (state pu startings current)			
8	DRIVEN LOAD AND COUPLING			
8.1	Load type		Various	
8.2	Load moment of inertia at motor speed	kg.m ²		
8.3	Coupling method (direct/gearbox/v-belt)			
9	BEARINGS			
9.1	Manufacturer			
9.2	DE bearing type (ball/roller/sleeve)		Ball/roller	
9.3	DE bearing lubrication type (sealed/regreasable)			
9.4	DE bearing life (L10)	h		
9.5	DE bearing regrease interval	h		
9.6	NDE bearing type (ball/roller/sleeve)		Ball/roller	
9.7	NDE bearing lubrication type (sealed/regreasable)			
9.8	NDE bearing life (L10)	h		
9.9	NDE bearing regrease interval	h		
9.10	Bearing thermal protection (thermistor/PT100)			
10	DIMENSIONS AND WEIGHT			
10.1	Motor frame number			

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
10.2	Motor weight	kg		
11	VARIABLE SPEED APPLICATIONS			
11.1	Operating speed range	rpm	As per load	
11.2	Maximum safe operating speed	rpm		
11.3	Peak voltage withstand level	V		
11.4	Voltage gradient withstand level	V/s		
11.5	Separately-powered cooling fan			
12	OPTIONAL ITEMS			
12.1	Anti-condensation heaters		Yes	
12.2	Slide rails (for v-belt drives)		No	
12.3	Surge protection devices		No	
12.4	Adjusting bolts required		Yes	
13	FACTORY TESTS			
13.1	Routine tests in addition to SANS 1804-2 requirements			
13.1.1	Insulation resistance check		Yes	
13.1.2	Vibration velocity measurement		No	
13.2	Type tests in addition to SANS 1804-2 requirements			
13.2.1	Current vs speed curve		Yes	
13.2.2	Torque vs speed curve		Yes	
14	DRAWINGS / CURVES TO BE PROVIDED WITH TENDER			
14.1	Motor general arrangement with dimensions		Yes	
14.2	Main terminal box with fault rating indicated		Yes	
14.3	Current vs speed curve		Yes for ≥30kW	
14.4	Torque vs speed curve		Yes for ≥30kW	
<p>Regardless of any information provided in this technical data sheet, the equipment to be provided will comply with the specified requirements</p>				
<p>Name (Print): _____ Signature:. _____</p>				

BILL C: ELECTRICAL				
LV SWITCHGEAR AND CONTROLGEAR ASSEMBLIES - MOTOR CONTROL CENTRES				
	DESCRIPTION	UNIT	SPECIFIED	OFFERED
	This data sheet is applicable to the following Motor Control Centres			
1	GENERAL			
1.1	MCC Manufacturer			
1.2	Tested with Stated Deviations to SANS 1973-1	Yes/No	Yes	
1.3	Type Test Certificate Required	Yes / No	Yes	
1.4	Control Voltage	230V/ 24VDC		
1.5	Compartment type	pattern/ withdrawable	Fixed pattern	
2	CONSTRUCTION REQUIREMENTS			
2.1	Steel Work Manufacturer			
2.2	Form of Internal Separation		3b/4a	
2.3	Material of Construction		3CR12	
2.4	Ingress Protection (doors closed)	IP	42	
2.5	Method of Installation		Floor Standing	
2.6	Epoxy Powder Coated	Yes / No	Yes	
2.7	Colour of Assembly		Electric Orange	
2.8	Size of Panel	HxWxD	H <2100	
2.9	Spare Space Required	%	>=20	
2.10	Access	Back / Front/ Side	Front & Rear	
2.11	Cable Entry	Top/ Bottom	Bottom	
2.12	Doors / Removable Panels		Doors	
2.13	Door Locks	Yes / No	Yes	
2.14	Door Locks - Type		Square key	
2.15	Door Locks - Material			
2.16	Incomer Section Required	Yes / No	Yes	
2.17	Corrosion protection		Epoxy coated	
2.18	Gland Plates		Not painted; Alu for single core cables	
3	ELECTRICAL COMPONENTS			
3.1	Busbars			
3.1.1	Material		Copper	
3.1.2	Tinned	Yes / No	Yes	
3.1.3	Current Density	A/mm ²	<2 as per type test	

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
3.2	Air Circuit Breakers			
3.2.1	Manufacturer			
3.2.2	Type		Fixed pattern	
3.2.3	Model			
3.2.4	Rated Current	A	As per SLD	
3.2.5	Service short-circuit breaking capacity (Ics)	kA	As per SLD	
3.2.6			Electronic	
3.2.7	Short-circuit release		Electronic	
3.2.8	Motorised	Yes / No	Yes for MCCs With Generator supply	
3.3	Moulded Case Circuit Breakers			
3.3.1	Manufacturer			
3.3.2	Type		Fixed	
3.3.3	Model			
3.3.4	Rated Current	A	As per SLD	
3.3.5	Service short-circuit breaking capacity (Ics)	kA	As per SLD	
3.3.6	Overload release		Thermal/ electronic	
3.3.7	Short-circuit release		Magnetic/ electronic	
3.4	Miniature Circuit Breakers			
3.4.1	Manufacturer			
3.4.2	Type			
3.4.3	Model			
3.4.4	Tripping Curve		C or as per SLD	
3.5	Fuse Switch-Disconnecter			
3.5.1	Manufacturer			
3.5.2	Model			
3.6	High Rupture Capacity (HRC) Fuse Links			
3.6.1	Manufacturer			
3.6.2	Model			
3.7	Surge Arrestors			
3.7.1	Power Circuits - Manufacturer			
3.7.2	Power Circuits - Model			
3.7.3	Power Circuits - Rating	kA		
3.7.4	Remote Indication to PLC	Yes / No	Yes	
3.7.5	Control Circuits - Manufacturer			
3.7.6	Control Circuits - Model			
3.7.7	Remote Indication to PLC	Yes / No		
3.8	Contactors			

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
3.8.1	Manufacturer			
3.8.2	Model			
3.8.3	Contact rating		AC3	
3.8.4	Coordination		Type 2	
3.9	Overload Relays			
3.9.1	Manufacturer			
3.9.2	Type			
3.9.3	Model			
3.9.4	Rated Current	A	As per SLD	
3.9.5	Resettable from front of MCC	Yes / No	Yes	
3.9.6	LCD	Yes / No	No	
3.10	Miniature Relays			
3.10.1	Manufacturer			
3.10.2	Model			
3.11	Control switches and pushbuttons			
3.11.1	Manufacturer			
3.11.2	Model			
3.12	Indicating Lamps			
3.12.1	Manufacturer			
3.12.2	Model			
3.12.3	Type		LED	
3.13	Power Meter for Incomer(s)			
3.13.1	Manufacturer			
3.13.2	Model			
3.13.3	Communication Protocol		Modbus/ Ethernet	
3.13.4	Harmonics Measurement	Yes / No	No	
3.13.6	Time of use measurement	Yes / No	No	
3.13.7	Bi-directional	Yes / No	No	
3.13.8	Datasheet provided with tender	Yes / No	Yes	
3.13.9	Data logging functionality	Yes / No	Yes	
3.14	Control-Circuit and auxiliary supply transformer			
3.14.1	Manufacturer			
3.15	Capacitors for Individual Power Factor Correction			
3.15.1	Manufacturer			
4	ACTIVE HARMONIC FILTER (if applicable)			N/A
4.1	Manufacturer			
4.2	Model			
4.3	Type			

	DESCRIPTION	UNIT	SPECIFIED	OFFERED
4.4	Datasheets included with tender	Yes / No		
5	FIELD E-STOP/START CONTROL STATIONS			
5.1	Method of Installation		Pedestal	
5.2	Material of Construction		HDG	
5.3	Manufacturer			
5.4	Keyswitch Required	Yes / No	No	
5.5	IP rating	IP	65	
6	SUPPLEMENTARY DETAILS			
Regardless of any information provided in this technical detail sheet, the equipment to be provided will comply with the specified requirements				
Name (Print):		Signature:..		

C: Total Summary Page: Electrical Works		
Item	Description	amount
1	Distribution Transformer	
2	Variable Frequency Converters	
3	Programmable Logic Controllers	
4	Low Voltage Soft Starters	
5	Cable Support	
6	LV Cables	
7	Control Instrumentation and Data Cables	
8	LV Electrical Motors	
9	LV Switchgear and Control gear Assemblies – Motor Control Centres	
	SUB-TOTAL BILL C TO MAIN SUMMARY PAGE	

BILL D: BUILDING & STRUCTURAL (2 Guard Houses)					
2	Earthworks				
Item	Description	unit	quant	rate	amount
2.1	Site clearance	m2	12000		
2.2	Setting out	1	sum		
2.3	Excavations	m3	20		
2.4	Landscape the Site	Prov	1	250 000	250 000.00
2.5	EO for hard rock	m3	50	rate only	
2.6	EO for soft rock	m3	50	rate only	
	Subtotal carried to summary Building Works				
3	Concrete works-foundations				
3.1	Cast strip foundations with 20Mpa concrete	m3	10		
	Subtotal carried to summary Building Works				
4	DPC				
4.1	Dpc under walls	m	60		
	Subtotal carried to summary Building Works				
5	Brickwork sub structure				
5.1	one brickwall	m2	6	rate only	
5.2	Half brickwall	m2	30		
5.3	Brickforce in every course	m	200		
	Subtotal carried to summary Building Works				
6	Filling				
6.1	Use filling from excavations and compact	m3	4		
6.2	Use imported approved gravel filling and compact	m3	12		
	Subtotal carried to summary Building Works				
7	DPM				
7.1	Install 250mm micron damp proof membrane under concrete slab	m2	40		
	Subtotal carried to summary Building Works				
8	Electrical-first installation				
8.1	Allow electrical installation for db sleeves under floor	Pc Sum	1	6000.00	6000.00
8.2	Allow for installation of complete high must light on Site (cabling, Concrete footing, connection, and commission). The light must be both electrical and solar dependant	sum	1		
	Subtotal carried to summary Building Works				

9	Plumbing -first installation				
Item	Description	unit	quant	rate	amount
9.1	Allow sleeves for under floor slab	pc sum	1	6000.00	6000.00
	Subtotal carried to summary Building Works				
10	Concrete works-floor slab				
10.1	Cast floor slab 75mm thick	m3	4		
	Subtotal carried to summary Building Works				
11	Dpc under walls				
11.1	110mm walls	m	12		
11.2	220mm walls	m	40		
	Subtotal carried to summary Building Works				
12	Brickwork superstructure				
12.1	One brickwall	m2	100		
12.2	Half brickwall	m2	30		
	Subtotal carried to summary Building Works				
13	Brickforce				
13.1	110mm brickforce	m	150		
13.2	220mm brickforce	m	200		
13.3	Allow for 6mm double anchor roof wires	each	12		
	Subtotal carried to summary Building Works				
14	Pre-cast lintels				
14.1	SABS Approved concrete lintels	no	12		
	Subtotal carried to summary Building Works				
15	Steel windows				
15.1	Type NC2F windows	no	4		
15.2	Type W1 windows (1.2x1.2m)	no	4		
	Subtotal carried to summary Building Works				
16	Steel door frames				
16.4	Steel door frames	no	2		
16.5	Steel door -Heavy duty bugler door with lock	no	2		
	Subtotal carried to summary Building Works				
17	Timber doors				
17.1	Meranti open braced door	each	2		
17.2	Veneer internal door	each	4		
	Subtotal carried to summary Building Works				

18	Locksets				
Item	Description	unit	quant	rate	amount
18.1	four lever locksets	each	2		
18.2	three lever locksets	each	4		
	Subtotal carried to summary Building Works				
19	Plumbing				
19.1	PC Amount for Plumbing as per plan	Pc Sum	1	70000.00	70000.00
	Subtotal carried to summary Building Works				
20	Electrical				
20.1	PC Amount for electrical as per plan	Pc Sum	1	40000.00	40000.00
	Subtotal carried to summary Building Works				
21	Glazing				
21.1	4mm obscure glass to bathroom windows	m2	10		
21.2	6mm Safety glass to w1 windows	m2	10		
	Subtotal carried to summary Building Works				
22	Windowsills				
22.1	10mm approved fibre cement internal windowsills	m	12		
22.2	Approved concrete external windowsills	m	12		
22.3	Dpc to underside of sills	m	12		
	Subtotal carried to summary Building Works				
23	Ceilings				
23.1	Pvc ceilings on Branderings to supplier's details	m2	32		
23.2	Approved Cornice with Approved glue	m	72		
	Subtotal carried to summary Building Works				
24	Roofing				
24.1	Allow pc sum for trusses and purlins	pc	1	30000.00	30000.00
	Subtotal carried to summary Building Works				
25	Fascia's and Bargeboards				
25.1	230mm Fascia	m	23		
25.2	230mm Bargeboards	m	40		
	Subtotal carried to summary Building Works				
26	Plastering				
26.1	15mm plaster to internal and external walls	m2	180		
26.2	EO for Corners	m	56		
26.3	25mm screed to floors	m2	30		
	Subtotal carried to summary Building Works				

27	Painting				
Item	Description	unit	quant	rate	amount
27.1	Plaster undercoat	m2	180		
27.2	2 layers Dulux Paint to walls	m2	180		
27.3	2 layers enamel paint to steel windows and door frames including primer coat	m2	80		
27.4	Approved Varnish to doors	m2	30		
	Subtotal carried to summary Building Works				
28	Gutters and downpipes				
28.1	Approved gutters on gutter brackets	m	10		
28.2	Approved downpipes with approved holder bats	m	6		
	Subtotal carried to summary Building Works				
29	Tiles				
29.1	Ceramic floor tiles to floors	m2	30		
29.2	150mm white glazed tiles to walls and splash tiles at basins and sinks	m2	4		
	Subtotal carried to summary Building Works				
30	Renovation of Existing Pump Station 1				
30.1	Replacement of the existing roof structure (old trusses and old roof sheets) with steel roof structure and new roof sheets with new gutters and ceiling, paint work, replace existing wooden door with steel door, waterproofing the pump house	Prov	1	500000	500000.00
	Subtotal carried to summary Building Works				
D: Total Summary Page for Building Works					
Item	Description	amount			
2	Earthworks				
3	Concrete works-foundations				
4	DPC				
5	Brickwork sub structure				
6	Filling				
7	DPM				
8	Electrical-first installation				
9	Plumbing -first installation				
10	Concrete works-floor slab				
11	Dpc under walls				
12	Brickwork superstructure				
13	Brickforce				
14	Pre-cast lintels				
15	Steel windows				
16	Steel door frames/Steel door				
17	Timber doors				

18	Locksets	
19	Plumbing	
20	Electrical	
21	Glazing	
22	Window sills	
23	Ceilings	
24	Roofing	
25	Fascias and Bargeboards	
26	Plastering	
27	Painting	
28	Gutters and downpipes	
29	Tiles	
30	Renovation of Pump Station 1	
	SUB-TOTAL BILL D TO MAIN SUMMARY PAGE	

Item	Description	unit	quant	rate	amount
	BILL E - OCCUPATIONAL HEALTH & SAFETY				
1	Notification of Construction Work				
	Allow for the costs on notification of the Provincial Director of construction work Regulation	sum	1		
2	Program				
	Allow for the costs on setting up a Health and Safety Program including File on site Regulation 3 & 5. Include the costs to compile the following documents for the file to be kept on site.				
	Copy of Construction Regulations				
	Copy of tender document				
	Copy of drawings				
	Notification of construction work				
	Letters of appointment				
	Company safety Policy				
	Company organogramme				
	Notice in respect of machinery				
	Ten commandments of safety				
	Emergency telephone numbers				
	List of subcontractors				
	Proof of Registration with COID Insurer				
	Training material				
	Risk Assessments and method statements				
	Registers as specified elsewhere				
	Safe work procedures				
	The file shall be a lever arch file				
	With original colour documents of acceptable standards.				
	The file will be expanded during				
	The project as and when required By the Client.	sum	1		

3	Risk Assessment				
	Allow for the costs of a competent person to carry out a Risk Assessment	sum	1		
4	She Co-ordinator				
	Allow for the appointment of a SHE Coordinator to do monthly Inspections (Control on SHE Representative)	months			
	Provisional sum				
5	Health & Safety Induction Trainer				
	Allow for the appointment of a H & S Induction Trainer	sum	1		
6	Safe Work Procedures				
	Allow for the costs of setting up safe work procedures by competent person.	sum	1		
7	She Representative				
	Allow for the appointment of a SHE Representative to be permanently on site.	months			
	<u>Allow for the following appointments to be part of the functions of the SHE Representative</u>				
	Accident Investigator				
	Allow for the appointment of an Accident Investigator				
	Construction Vehicle and Mobile Plant Inspectors				
	Allow for the appointment of a full time inspector of construction vehicles				
	Hand Tool Inspector				
	Allow for the appointment of a full time Hand Tool Inspector				
	Portable Electrical Equipment Inspector				
	Allow for the appointment of a full time Portable Electrical Equipment Inspector				
	Stacking and Storage Inspector				
	Allow for the costs of a competent person to supervise all stacking and storage				
	Hygiene and Facility Inspector				
	Allow for the appointment of a full time Hygiene and facility Inspector				
	Fire Equipment Inspector				
	Allow for the costs of a competent person to inspect all fire equipment				
	First Aid Box Inspector				

	Allow for the costs of a competent person to inspect the first -aid box				
	Provisional sum for above	months			
	<u>Allow for the following appointments of personnel with responsibilities towards H&S Supervisors</u>				
	Allow for the appointment of full time employees as the construction supervisors	months			
	Fire Fighting Equipment				
	Provide 3 kg firefighting equipment suitable for electrical fires on each site	ea	2		
	First Aid				
	Allow for the cost of a basic First Aid Kit and Stretcher	ea	1		
	Personal Protective clothing				
	Provisional rates for the following Items will be remeasurable				
	Shoulder length PVC Gloves	ea	1		
	Plastic Trousers	ea	1		
	Safety Goggles	ea	1		
	Gum Boots	ea	1		
	Welding Helmet	ea	1		
	Gas Welding Safety Goggles	ea	1		
	Safety Shoes	ea	1		
	Dust Masks	ea	1		
	Leather Aprons	ea	1		
	Hard Hats	ea	1		
Total Carried Forward to Main Summary Page					

<u>MAIN TOTAL SUMMARY PAGE</u>					
A	P & G,s	Page	90		
B	MECHANICAL WORKS	Page	96		
C	ELECTRICAL WORKS	Page	121		
D	BUILDING WORKS	Page	126		
E	OHS	Page	128		
F	SUB-TOTAL				
G	CONTINGENCIES @ 10%				
H	TOTAL EXCL VAT				
I	VAT @ 15%				
J	TOTAL TENDER AMOUNT CARRIED TO FORM OF OFFER				



METSIMAHOLO LOCAL MUNICIPALITY

BID NO MLM 21/2022/23

UPGRADING OF SASOLBURG WATER PUMP STATION

C3: SCOPE OF WORK

PART C3: SCOPE OF WORKS

	<u>Pages</u>
C3.1 Description of the Works	131
C3.2 Engineering	137
C3.3 Procurement	138
C3.4 Construction (Civil and Structures)	141
C3.5 Management	243

Status

Should any requirement or provision in the parts of the Scope of Work conflict with any requirement of any Standardised Specification, or any drawings, the order of precedence, unless otherwise specified, is:

- Project Specifications
- Drawings
- Scope of Works
- The following variations and additions to the SABS 1200 Standardized Specifications referred to shall apply to this Contract.

C3.1 DESCRIPTION OF THE WORKS

CONTENTS

1. EMPLOYER'S OBJECTIVES
2. OVERVIEW OF THE WORKS
3. EXTENT OF THE WORKS
4. CONSTRUCTION PROGRAMME
5. CONTRACTOR'S CAMP SITE AND SITE FACILITIES AVAILABLE
6. SITE FACILITIES REQUIRED
7. FEATURES REQUIRING SPECIAL ATTENTION
8. ACCOMMODATION OF TRAFFIC

1. EMPLOYER'S OBJECTIVES

The Municipality also intends for the communities directly or indirectly affected by the project to benefit by being involved in the project. All the representatives on the Community forums should be democratically elected and recognized by the community as their legal representatives.

2. OVERVIEW OF THE WORKS

The work comprises mainly the refurbishment of the Sasolburg water pump station and replacement of pumps, motors, valves including refurbishment of the existing pump house. Construction of two (2) new guard houses. LV switchgear, transformers, motor control equipment, cabling, protection, control, instrumentation, automation, small power and lighting associated with the project.

2.1 Location of the Site

The proposed site for the Upgrading of Sasolburg Pump Station is located at Sasolburg Water Treatment Works in Sasolburg, in the Metsimaholo Local Municipality, in the Free State Province. The geographic coordinates of the site are 26°48'51.8"S / 27°50'36.9"E. The site is located within the boundaries of the Sasolburg Water Treatment Works. Sasolburg Pump Station is approximately 5km East West of Sasolburg.

2.2 General description of scope of works

The scope of works is divided into three Civil, Mechanical and Electrical Engineering parts, namely the following:

I. PUMP STATION 2

1. Upgrade the complete Electrical Infrastructure of the water works pumpstation, LV switchgear, transformers, motor control equipment, cabling, protection, control, instrumentation, automation, small power and lighting associated with the project.
2. Replace three (3) pumps and motors,
3. Add two (2) new sump pumps into the sump hole in other to have to pumps working simultaneously and the other one will work as a standby.
4. Replace the old plant control system with the new Telematics/Scada system,
5. Refurbish the existing building structure to a building regulation compliant structure.
(Replace the old roof, rafters, facia boards and waterproof the building on the inside)
6. Provide the new fan to supply the cool air at the pump section for better air circulation,
7. All sluice gates to be supplied with new packing inside them,
8. Replace the current wooden door with heavy steel door for theft protection,
9. Build two guardhouses and install the gate next to the pumpstation 2.

2.3 Temporary Works

The contractor is to design, supply, construct, demolish and spoil at his own cost any temporary works required in order to carry out the construction works as required.

2.4 Access

Furthermore, it is a requirement of this Contract that the contractor ensures that all residents have access to their properties after hours and on weekends; all businesses are to have access during business hours. The Contractor is to implement temporary measures / deviations as required in order to achieve this outcome. Prior to the implementation of any deviation, written permission for such deviations shall be obtained from the Principal Agent. The Contractor shall advise all residents, community leaders and other stakeholders at least 2 weeks prior to the commencement of construction activities in an area. The Contractor is to employ a Community Liaison Officer in conjunction with the community structures in the area in order to achieve this outcome.

3. EXTENT OF THE WORKS

1. Upgrade the complete Electrical Infrastructure of the water works pumpstation, LV switchgear, transformers, motor control equipment, cabling, protection, control, instrumentation, automation, small power and lighting associated with the project.
2. Replace three (3) pumps and motors,
3. Add two (2) new sump pumps into the sump hole in other to have to pumps working simultaneously and the other one will work as a standby.
4. Replace the old plant control system with the new Telematics/Scada system,
5. Refurbish the existing building structure to a building regulation compliant structure.
(Replace the old roof, rafters, facia boards and waterproof the building on the inside)
6. Provide the new fan to supply the cool air at the pump section for better air circulation,
7. All sluice gates to be supplied with new packing inside them,
8. Replace the current wooden door with heavy steel door for theft protection,
9. Build two guardhouses and install the gate next to the pumpstation 2.

A. SERVICES

A schedule of affected services with the respective service authorities can be found in the provided tender drawings.

C.1. Telkom

The relocation of Telkom infrastructure is not envisaged. If any damages occur (as a result of the Contractor's operations) the Contractor will be required to contact Telkom to arrange for timeous reparations to the services (at the Contractor's expense). The Contractor may not repair any damages himself unless specifically instructed (in writing) by Telkom to do so.

C.2. Municipal Services

Relocation of municipal services is not foreseen at this stage. The existing services must be identified and clearly marked to prevent damages to these services.

C.3. Fibre Optic Cables

The relocation of fibre optic is not envisaged. If any damages occur (as a result of the Contractor's operations) the Contractor will be required to contact the relevant service provider to arrange for timeous reparations to the services. The Contractor may not repair any damages himself unless specifically instructed (in writing) by the relevant service provider, to do so.

The cost of the repairs will be for the Contractors account.

4. CONSTRUCTION PROGRAMME

The time for completion, as stated in the Contract Data in terms of Clause 1.1.1.14 of the Conditions of Contract, is _____ **months**, excluding the year end break (builder's holidays). The Contractor shall plan and programme his construction sequence for completion within the time period specified.

5. CONTRACTOR'S CAMP SITE AND SITE FACILITIES AVAILABLE

5.1 Location of Contractor's Camp Site

No specific land has been made available for the Contractor's camp site and office facilities for the Engineer. The Contractor shall make his own arrangements concerning a suitable approved site and location, as well as the provision of water, electricity and other services for the camp site and office facilities.

The Contractor's camp site shall be maintained in a neat and tidy condition and on completion of the Works, the camp area shall be cleared and reinstated; all to the satisfaction of the Engineer. Any damage to property shall be made good to the satisfaction of the Engineer and at the Contractor's expense.

5.2 Provision for Services

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

6. SITE FACILITIES REQUIRED

Office facilities as scheduled are required on the site for the Engineer or his representative.

7. FEATURES REQUIRING SPECIAL ATTENTION

7.1 Existing Services

Various types of services, both overhead and underground, exist within the boundaries of the site. It is envisaged that it will be necessary for the Contractor to arrange for the removal, relocation and protection of existing services. Should any work become necessary due to unforeseen circumstances then all work shall be done strictly in accordance with the requirements of the relevant service owner and in accordance with the requirements of these Works Specifications.

Procedures for the protection and/or relocation of such services are outlined in the Project Specifications. All costs related to the contents of this paragraph shall be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

7.2 Proposed Services

No new services are envisaged in this contract except roads and stormwater.

7.3 Damage to Unknown Services

Where damage is incurred to services not shown in the services drawings and unknown to the contractor at the time of construction, then the costs to repair and reinstate such services shall be borne by both the Contractor and the Client in a 50% proportion to each party.

7.4 Construction in restricted areas

It will be necessary for the Contractor to work within restricted areas. No additional payment will be made for work done in such areas, despite indications to the contrary in the Standard Specifications.

7.5 Water for construction purposes

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

7.6 Weatherproof Protection for Workers

All staff required to continue working during rain shall be provided with approved protective clothing and footwear.

7.7 Night Work and Work on Public Holidays

Where the Contractor requires staff to work overtime, in accordance to the Basic Condition of Employment Act, he shall make the necessary arrangements with the Engineer and obtain written approval from the Engineer. The Contractor shall bear the cost of his overtime work.

7.8 Environmental Requirements

The Contractor shall take particular note of the environmental requirements contained in Part C of the Works Specifications.

Personnel and plant shall not enter property beyond the road reserve boundary irrespective of whether or not the boundary is fenced.

The Contractor shall take every precaution to avoid damage to vegetation within that area of the road reserve which falls outside the designated work area as indicated on the drawings. Any damage caused is to be repaired at the Contractor's expense.

Storage and stockpiling of materials within the road reserve will not be permitted without the written consent of the Engineer. Excess material from excavations and waste material shall be spoiled off site at suitable locations.

C3.2 ENGINEERING

1. DRAWINGS

The Works shall be constructed in accordance with the design drawings included in the Contract Documents.

The reduced drawings listed and included in C5 of the tender documents shall be used for tender purposes only.

The Contractor will be supplied with three (3) unreduced paper prints of each of the drawings and any others required for construction. These copies are issued free of charge and the Contractor shall make any additional copies he may require at his own cost.

Only figured dimensions shall be used and drawings shall not be scaled unless otherwise instructed.

The levels given on construction drawings are subject to confirmation on site, and the Contractor shall submit all levels to the Engineer for confirmation before he commences any construction work. The Contractor shall also check all clearances given on the drawings and shall inform the Engineer of any discrepancies.

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

Any information in the possession of the Contractor, which the Engineer requires to complete his record drawings shall be supplied to the Engineer's Representative before a certificate of completion will be issued.

C3.3 Procurement

3.3 PROCUREMENT

3.3.1 Requirements

The contractor shall be required to adopt labour based techniques through the full spectrum of the works with the proviso that the Clients specific objectives regarding time and quality are not compromised. **Maximisation of employment shall be of the essence on this contract.**

Together with their tenders, all Tenderers are required to submit a comprehensive **implementation plan** clearly stating the labour content and number of jobs that shall be created. The employment of labour shall be reflected in a programme in sufficient details to enable the Project Manager to monitor and compare it with the implementation plan.

The Contractor shall be required to submit employment data on a monthly basis to the Project Manager.

Tenderers are to also note that it is an explicit condition of this tender that all unskilled labourers on the project are to be employed from the local community. The Contractor shall in general, maximise the involvement of the local community and employ a minimum of 10 people.

3.3.2 Subcontracting – Special Conditions of Contract

Participation and Advancement of Start-Up, Small and Micro Enterprises

The Metsimaholo Local Municipality (MLM) has identified job creation and access to procurement opportunities by Start-ups, Small and Micro enterprises (SMMEs) as an essential requirement towards building an economically viable City. In this regard the following definitions are applicable:

“Start-up Enterprises” means an enterprise that has been in existence and operating for less than two years.

“Small Enterprises” means an enterprise that has a CIDB grading designation of 1 or 2.

“Micro Enterprises” means an enterprise that has a CIDB grading designation of 3.

“Locally based SMMEs” means enterprises that have their operational base in the ward in which the project is to be executed or, alternatively, the members of the enterprise are resident in the particular ward. Should suitable locally based SMME contractors as defined above not be available in the particular ward, then they shall be sourced from adjacent wards.

If it is established that the SMMEs are sufficiently resourced to execute the proposed works as a complete package the Contractor may conclude full sub-contract agreements with locally based SMMEs.

The Contract Data must record the specific requirements in respect of penalties, retention and payment. With regard to the latter, the Contractor is to allow for fortnightly certificates from the SMMEs and for payment to the SMMEs to be effected within 7 days of certification. In order to achieve the goals of this policy and to ensure that the SMMEs are treated fairly and given every opportunity to advance their business whilst delivering a successful project, the Contractor is to note the following and provide for any cost that may be associated therewith.

1. If appropriate, the SMME bill of quantities is to provide for market related P&G items in order that the SMME may be compensated for any unforeseen delays or events that impact on his ability to complete his works.
2. The Contractor will be expected to have clearly specified the programme dates to the SMME contractors and these dates are to be included in the contract of agreement between the two parties. The Contractor is to monitor the SMME contractor's progress against the programme and hold progress meetings with the SMME contractors where minutes are to be kept and signed off by both parties.
3. The Contractor is to assess the skills of the SMME contractor and provide the relevant support and training where it is necessary in order for the SMME contractor to complete the works to programme, budget and specification. The Managing Contractor will be expected to provide on-site training to the SMME contractors that will ensure that the SMME contractor's staff is suitably trained to execute the works and that they receive sufficient relevant experience on the project.
4. The Contractor is responsible for safety compliance on the project and will assist the SMME contractors in all aspects to achieve safety compliance, that will include:
 - a) Assisting the SMME contractors with developing their safety files, legal appointments, etc
 - b) Assisting the SMME contractors with achieving safety on site.
 - c) Having tool box talks with the SMME contractor's employees on a daily basis.
 - d) Providing all safety equipment and signage.
 - e) Providing safety training where necessary.
5. Contractor is to provide all the necessary equipment for the timeous monitoring and the checking of the quality of works as carried out by the SMME contractors. The Contractor will be expected to monitor the SMME contractor's works for quality compliance and provide all the necessary support to the SMME contractors in order to achieve quality requirements. The Contractor is to ensure that if the SMME contractor's quality of works does not achieve specification the Contractor will assist the SMME contractors to achieve specification and not allow the works to continue until the quality requirements are achieved.
6. The Contractor is to generate monthly reports for submission to the MLM that includes the following:
 - a) SMME contractor resources on the site, ie supervisors, labour, plant tools and equipment
 - b) SMME contractor progress of works on site.
 - c) SMME contractor quality control on site.
 - d) SMME contractor expenditure on the project versus target expenditure.
 - e) Copies of minutes of the SMME contractor and Contractor progress meetings.
 - f) Concerns and improvements to be made.

The Tenderers are to price the works to achieve full compliance with the above requirements. Failure of the Contractor to achieve these requirements may result in the MLM enforcing compliance by appointing 3rd parties if necessary to assist and deducting all reasonable costs for achieving compliance from money due to the Contractor.

Following from the above, the SMME's to be contracted on the project must be selected from the provided database which is attached on this document contract. The data base includes SMME that are youth, women owned, disabled and ex-combats. The contractor will be expected to give preference to SMME's that comply with all/most of these groups. The following information must be provided by said contractor on the date of tender closure.

1. Detailed approach and methodology on the employment of local SMME's
2. SMME/s company name/s to be employed on the project.
3. SMME contact persons
4. Works to be executed by SMME/s
5. Programme (anticipated start, duration and end dates) applicable to the works defined in item 4 above.
6. Estimated value of the works identified in item 4 above.

The Metsimaholo Local Municipality (MLM) reserves the right to withdraw our acceptance of offer, should the appointed Contractor fail to satisfactorily address the above requirements (1 to 6) within 14 days of the commencement date of the contract. Approved documentation will form part of the contract.

MEASUREMENT AND PAYMENT

	Item	Unit
3.3.3	Mark Up for Management of Micro Enterprises (SMME's)	%
	<p>The percentage Mark Up tendered on the value of the Micro Enterprises work shall include full compensation for all guidance, supervision, mentoring, setting out and monitoring activities that may be deemed necessary to ensure the Works carried out by MEs are in accordance with the technical and OHS specifications and within the agreed timeframes.</p> <p>The payment will be made on a monthly basis, based on the actual certificate value of the ME, for the said month.</p>	
3.3.4	Penalty Calculation	
	Use of Micro Enterprises (SMME's)	

The Contractor is to indicate to the Municipality via a report certified by their auditors indicating that at least a portion of the Contract value excluding PC Sums, Main Contractors P&G's and Vat, has been paid to SMME's at the end of the Contract before the retention money is released

C3.4 CONSTRUCTION

WORKS SPECIFICATIONS

CONTENTS

C3.4.1 PART A: GENERAL

A1 GENERAL

SECTION	DESCRIPTION	PAGE
A 1	Particular Generic Specifications	142
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C3.4.1 PART A: GENERAL

A GENERAL

A 1 Particular generic specifications

For the purpose of this Contract:

- a) where gender terms are used, it shall be applicable to both male and female.
- b) "VAT" shall mean Value Added Tax in terms of the Value Added Tax Act 89 of 1991 as amended.

A 2 Plant and materials

The Contractor is required to provide all plant and materials necessary to carry out the works as required. No additional allowances other than those already specified in the schedule of quantities shall be allowed for with respect to plant and materials.

A 3 Construction equipment

The Contractor is required to provide all equipment necessary to carry out the works as required. No additional allowances other than those already specified in the schedule of quantities shall be allowed for with respect to equipment.

A 4 Existing services

The Contractor:

- a) must make provision for the possible existence of numerous services (e.g.: Stormwater, Water, Electrical, Sasol, PRASA, Rand Water, Eskom, Telkom, Neotel etc.) within and in close proximity to the work areas.
- b) shall be provided with record information from services authorities to enable him to apply for wayleave at the Metsimaholo Local Municipality.
- c) is to record on as built drawings the location of existing services or services which have been relocated during Contract Period.
- d) must inform the relevant service provider immediately (within 2 hours of incident) such that procedures for the reinstatement of the service can be effected, should he damage or break an existing service (whether known or unknown).
- e) is responsible to provide his own equipment in order to determine the location of existing services. The provision of such equipment shall be deemed to have been included in the rates.

A 5 Site usage

Site usage shall be limited to hours as specified in the Contract Data, unless prior arrangement is made with the Engineer.

A 6 Permits

The Contractor will be required to obtain permits from all the applicable service provider's within the jurisdiction of the Municipality. It is the Contractor's responsibility to obtain final permit approval according to applicable procedures and specifications. Permits associated costs shall be deemed to have been included in the scheduled rates for excavation and location of existing services under the relevant section of SANS 1200 A.

A 7 Inspection of adjoining properties

The Contractor shall carry out inspections and evidence collection of properties adjoining the works to ensure that in the event of a claim arising from any of the owners of the adjoining properties for damage to property and the like, the Contractor has substantial evidence to support or refute such claims. The Contractor accepts full liability and responsibility for damage which he causes to adjoining properties as well as any costs involved in refuting or processing of such claims.

A 8 Electricity for construction purposes

The Contractor shall make arrangements with the relevant authority for the supply and distribution of power for purposes of this Contract, the cost of which shall be deemed to be included in the rates inserted in the Schedule of Quantities.

Power used for carrying out of the works in accordance with these Specifications will not be subject to measurement or payment.

A 9 Survey control and setting out of the works

The Contractor is to confirm the levels and coordinates of all benchmarks prior to commencing with construction.

A10 Method Statement

The Contractor shall provide the Engineer with a method statement indicating the manner and sequence in which he intends to construct the works, for each work area, with the program. In the method statement the Contractor must address at least the following items:

1. Sequence of the works for the relevant works area
2. Target dates for the tasks identified in sequence of the works for the relevant works area
3. Materials requirements
4. Construction Plant to be used
5. Services affecting construction
6. Any factors that could affect construction progress after commencement

The method statement must be approved by the Engineer before commencement of construction. In order to minimize the impact on traffic, pedestrians and business the Contractor will be required to segment the works in such a manner that no portion of the works is more than one day ahead of the following position i.e. trenches cannot be excavated more than one day ahead of pipe laying, pipes more than one day in advance of manhole construction and finishing off etc. These segments of the works shall be clearly defined in the Contractor's method statement for each work area.

The approval by the Engineer of any program shall have no contractual significance other than that the Engineer would be satisfied if the work is carried out in accordance to such program and that the Contractor undertakes to carry out the work in accordance with the program. It shall not limit the right of the Engineer to instruct the Contractor to vary the program should circumstances make this necessary.

A11 Software application for programming

The construction programme shall be completed in Microsoft ® Project 2010 or compatible software. The construction programme and updated versions thereof shall be made electronically available to the Engineer.

A12 Methods and procedures

The methods and procedures for the execution of the works shall be in accordance with the standard specifications and the variations and additions thereto.

A13 Quality plans and control

The Contractor shall be required to provide and maintain a quality plan to ensure that the quality of all work components is of a high standard. Such a quality plan shall be approved by the Engineer.

A14 Accommodation of traffic on public roads occupied by the Contractor**a) Accommodation of traffic**

The Contractor shall ensure the safe accommodation of traffic at all areas where the work may impact on traffic and shall provide all drums, watching, lighting, signs and barricades required by the road authorities, and in accordance with the South African Road Traffic Signs Manual. Penalties shall be imposed on the Contractor for non-compliance.

b) Access to properties

Adequate access shall at all times be maintained to public and private properties unless otherwise arranged and approved. Details of the proposed means of access shall be submitted before any such access is restricted. Claims arising from impeded access shall be the responsibility of the Contractor.

At least 2 days before commencing any work affecting access to a property, the Engineer and the occupier/owner of each such property shall be notified of the Contractor's intention to commence work, the date of commencement, expected duration and arrangements which will be made regarding maintenance of access.

c) Transport Department requirements

The Contractor must provide a bridge with side rails across excavations to allow pedestrians access to the sidewalk. Allowance for the costs associated with providing pedestrian access to sidewalks will be deemed to have been included under relevant Items in the Schedule of Quantities.

d) Services

Services to a property shall remain unimpeded. Where necessary for access or egress, excavated and filled works, concrete or asphalt surfaces shall be satisfactorily covered temporarily to protect the work from damage and to maintain access.

A15 Other contractors on site

There may be other contractors working in close proximity and/ or within the site boundaries road reserve completing other projects. As such, the Contractor is required to make adequate allowances for such possibilities. No claims with respect to works being carried out by other contractors will be entertained by the Employer.

A16 Testing, completion, commissioning and correction of defects

The onus is on the Contractor to produce work which will conform in quality and in accuracy of detail to the requirements hereinafter specified. The Contractor must clearly understand that it is not a duty of the Engineer or his representative to act as foreman or surveyor on the Works.

The Contractor shall, at his own expense, provide experienced engineers, foremen and surveyors together with all transport, instruments and equipment for supervising, checking and controlling the work.

The act of passing any completed work for payment by the Engineer shall not be construed as signifying approval or acceptance thereof. Failure on the part of the Engineer to reject any defective work or material shall not in any way relieve the Contractor of his obligations under the Contract, nor prevent later rejection when such work or material is discovered.

The contractor shall keep files of all the test results, which shall be accessible by the Engineer at any time. Two copies of these files shall be provided to the Engineer at the end of the project.

A17 Key personnel

The Contractor is to provide the Curriculum Vitae's of key personnel to be employed on the project as well as the person's position and responsibilities within the project team. The Contractor shall provide the following minimum key staff:

- a) Contracts manager;
- b) Site Agent;
- c) Health and Safety Officer; and
- d) Foremen.

A18 Management meetings

Bi-Weekly site meetings shall be arranged and facilitated by the Engineer. Senior Contractor management staff attendance shall be compulsory. The Contractor shall be required to provide reporting with regard to project progress, resources (human, plant and equipment), community issues, environmental and health and safety aspects.

A19 Forms for contract administration

The Contractor shall maintain files which shall contain project information related to project progress, resources (human, plant and equipment), community issues, environmental, health and safety aspects, penalties imposed, claims lodged and outcomes, disputes and resolutions, payment and variations.

A20 Daily records

The Contractor shall keep daily site records as required by the Employer and as specified herein. Daily records shall include, labour, plant, materials, rainfall, daily diary and the like.

A21 Payment certificates

Payment certificates shall be submitted to the Engineer, in the format required, for approval and final submission to the Employer on a monthly basis.

A22 FEATURES REQUIRING SPECIAL ATTENTION

A22.1 Security

The Contractor is responsible to provide his own security on site, as he deems necessary. The Employer shall not be held responsible for any loss or damage suffered by the Contractor, his plant, equipment, materials, subcontractors or employees as a result of a security incident of any nature.

A 22.2 Community liaison and community relations

The Contractor will be required to employ a community liaison officer for each section of the works for the duration of the construction activities, taking place within such area. The community liaison officer is to be appointed in consultation with the relevant ward councillor.

A 22.3 Notices and warning to the public

The Contractor must provide written notice to all consumers affected by the construction activities. The written notice shall outline the:

- a) nature of the works;
- b) expected inconvenience / disruption that the consumers can expect;
- c) timeframes for construction; and
- d) contact details in case of problems encountered.

A 22.4 Causes for rejection

Causes for rejection of the works shall include but is not limited to:

- a) incorrect grades and crossfalls;
- b) poor kerbing alignment and broken kerbs
- c) incorrect vertical and horizontal alignments
- d) layerworks and surfacing fail density and other prescribed tests
- e) Incorrect pipe grades, water infiltration at joints, poor workmanship to kerb inlets, manholes, etc.

**C3.4.1 PART B: PROJECT SPECIFICATIONS REFERRING TO THE
STANDARD SPECIFICATIONS**

Notes to the tenderer

**C3.4.1 VARIATIONS AND ADDITIONS TO SABS 1200 STANDARDIZED SPECIFICATIONS
AND PARTICULAR SPECIFICATIONS**

The following variations and additions to the SABS 1200 Standardized Specifications referred to shall apply to this Contract.

The prefix “PS” indicates an amendment to SABS 1200. The prefix “PSA” indicates an amendment to SABS 1200 A, “PSDB” to SABS 1200 DB and so on.

The letters and numbers following these prefixes respectively indicate the relevant Standardized Specification and clause numbers in SABS 1200 to which the variation or addition thereto applies.

An asterisk (*) placed next to a PS Subclause number denotes the inclusion of an additional Subclause for which no equivalent appears in SABS 1200.

The terms “project specification” or “Portion 2 of the project specification” appearing in any of the SABS 1200 Standardized specifications shall be replaced with the term “Scope of Work”.

The term “Scope of Work” shall mean Part 3 of The Contract.

Further to the above it should be noted that where in a specific Standardized Specification reference is made to a Subclause in another Standardized Specification, any amendment or addition to the Subclause referred to, as provided for in the Specification, shall apply. The aforementioned shall also apply with respect to Clauses referred to in a Particular Specification.

The variations and additions to the SANS 1200 Standardized Specifications follows herewith:

PSA GENERAL

PSA 1 SCOPE

Replace the contents of Clause 1.1, including the notes, with the following:

“1.1 This specification covers requirements, principles and responsibilities of a general nature which are generally applicable to civil, mechanical and electrical engineering construction and building works contracts, as well as the requirements for the Contractor’s establishment on the Site.”

PSA 2 INTERPRETATIONS

PSA 2.3 DEFINITIONS

In the opening phrase, insert the words: “the definitions given in the Conditions of Contract and” between the words “specification” and “the following”.

a) General

Add the following definitions:

“General Conditions / Conditions of Contract. The General Conditions of Contract specified for use with this Contract as amended in the Contract Data.

Specified As specified in the Standardized Specifications, the Drawings or the Scope of Work. “Specifications” shall have the corresponding meaning.”

c) Measurement and payment

Replace the definitions for “Fixed charge”, “Time-related charge” and “Value-related charge” with the following:

“Fixed charge. A charge that is not subject to adjustment on account of variations in the value of the Contract Price or the time allowed in the Contract for the completion of the work.

Time-related charge. A charge, the amount of which varies in accordance with the Time for Completion of the Works, adjusted in accordance with the provisions of the Contract.

Value-related charge. A charge, the amount of which varies pro rata with the final value of the measured work executed and valued in accordance with the provisions of the Contract.”

PSA 2.4 ABBREVIATIONS

a) Abbreviations relating to standard documents

Add the following abbreviation:

“CKS: SABS Co-ordinating Specification.”

PSA 3 MATERIALS

PSA 3.1 QUALITY

Where applicable, materials shall bear an official standardization mark.

Add the following:

"Where proprietary materials are specified, it is to indicate the quality or type of materials or articles required, and where the terms “or other approved” or “or approved equivalent” are used in connection with proprietary materials or articles, it is to be understood that the approval shall be at the sole discretion of the Engineer."

“PSA 3.3* ORDERING OF MATERIALS

The quantities set out in the Bill of Quantities have been carefully determined from calculations based on data available at the time of its compilation but are to be considered as approximate quantities only. Before ordering materials of any kind the Contractor shall be solely responsible for determining, from the Drawings issued or approved by the Engineer for construction purposes, the actual quantities of materials required for the execution of the Works. No liability or responsibility whatsoever shall be attached to the Employer or the Engineer in respect of materials ordered by the Contractor except when ordered in accordance with the Drawings issued or approved by the Engineer for construction purposes."

PSA 4 PLANT

PSA 4.1 SILENCING OF PLANT

Replace the contents of Clause 4.1 with the following:

“The Contractor’s attention is drawn to the applicable regulations pertaining to noise and hearing conservation, framed under the Occupational Health and Safety Act (Act No. 85 of 1993) as amended.

The Contractor shall at all times and at its own cost, be responsible for implementing all necessary steps to ensure full compliance with such

regulations, including but not restricted to the provision and use of suitable and effective silencing devices for pneumatic tools and other Plant which would otherwise cause a noise level in excess of that specified in the said regulations.

Where appropriate, the Contractor shall further, by means of temporary barriers, effectively isolate the source of such noise in order to comply with the said regulations."

PSA 4.2 CONTRACTOR'S OFFICES, STORES AND SERVICES

Add the following at the end of the first paragraph of Clause 4.2:

"The Contractor's buildings, sheds and other facilities erected or utilised on the Site for the purposes of the Contract shall be fenced off and shall contain all offices, stores, workshops, testing laboratories, toilet facilities, etc. as may be required by the Contractor. The facilities shall always be kept in a neat and orderly condition.

A suitable and dedicated material storage container as well as a furnished office shall be provided for the exclusive and sole use of the Micro Enterprise (SMME's) Subcontractors.

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

The Contractor shall provide on the Site and in close proximity to the actual locations where the work is being executed, one toilet per 15 workmen, which toilets shall be effectively screened from public view and their use enforced. Such toilets shall be relocated from time to time as the location of the work being executed changes, so as to ensure that easy access to the toilets is maintained.

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

PSA 5 CONSTRUCTION

PSA 5.1 SURVEY

PSA 5.1.1 Setting out of the Works

The installed benchmarks and erf boundary pegs shall be used by the Contractor for setting out the works.

Add the following paragraph:

"The Contractor shall be required to check and verify, prior to commencement of any construction work, all benchmarks and boundary reference pegs, as shown and detailed on the Drawings. Reference and

benchmark pegs disturbed and/or removed during the construction period shall be replaced by a Professional Land Surveyor and the Contractor shall bear the cost of such replacement. Payment to check and verify the reference and benchmark pegs will be made in terms of PSA 8.8.5."

PSA 5.1.2 Preservation and replacement of survey beacons and pegs subject to the Land Survey Act

Delete from the second sentence "Before the commencement "to" . . . apparently in their correct positions" and replace with the following:

"Immediately on taking over the site, the Contractor, in consultation and liaison with the Engineer, shall search for all pegs and the Contractor shall compile a list of pegs that are apparently in their correct position."

Replace the third sentence of Clause 5.1.2 with the following:

"At completion of the Contract, the Contractor shall expose and mark all pegs that were listed at the commencement of the construction as being in order and the Contractor shall arrange with a registered Land Surveyor the replacement of pegs that have become disturbed or damaged. The Contractor shall, as a precedent to the issue of the Certificate of Completion, provide to the Engineer, a certificate from the Registered Land Surveyor, certifying that all the pegs listed at the commencement of construction in accordance with the provisions of this Clause, have been checked and that those found to have been disturbed, damaged or destroyed have been replaced in their correct positions, all in accordance with the provisions of the said Act.

The costs of replacement and certification as aforesaid shall be entirely for the Contractor's account, provided always that the Contractor shall not be held liable for the cost of replacement of pegs which:

- (a) cannot reasonably be re-established in their original positions by reason of the finished dimensions of the Permanent Works; and
- (b) the Contractor can prove beyond reasonable doubt and to the satisfaction of the Engineer, were disturbed, damaged or destroyed by others beyond its control, and
- (c) were in close proximity to the work and which would unavoidably be removed, subject to the Engineer's approval being given to remove such pegs."

PSA 5.2 WATCHING, BARRICADING AND LIGHTING AND TRAFFIC CROSSINGS

Add the following:

"The Contractor shall comply in all aspects with the requirements of the Occupational Health and Safety Act (Act 85 of 1993), refer also PSA 5.7, PSA 5.9 and PSA 5.10."

PSA 5.3 PROTECTION OF STRUCTURES

Replace: "Machinery and Occupational Safety Act, 1983, (Act No. 6 of 1983)" with: "Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), as amended," and insert the following after "(Act No. 27 of 1956)": "as amended".

PSA 5.4 PROTECTION OF OVERHEAD AND UNDERGROUND SERVICES

Replace the heading and the contents of Clause 5.4 with the following:

"PSA 5.4 LOCATION AND PROTECTION OF EXISTING SERVICES

PSA 5.4.1 Location of existing services

Before commencing with any work in an area, the Contractor shall ascertain the presence and actual position of all services which can reasonably be expected by an experienced and competent Contractor to be present on, under, over or within the Site.

Without in any way limiting its liability in terms of the Conditions of Contract in relation to damage to property and interference with services, the Contractor shall, in collaboration with the Engineer, obtain the most up-to-date plans as are available, showing the positions of services existing in the area where it intends to work.

Neither the Employer nor the Engineer offer any warranty as to the accuracy or completeness of such plans and because services can often not be reliably located from plans, the Contractor shall ascertain the actual location of services depicted on such plans by means of careful inspection of the Site.

Thereafter, the Contractor shall, by the use of appropriate methodologies, carefully expose the services at such positions as are agreed to by the Engineer, for the purposes of verifying the exact location and position of the services. Where the exposure of existing services involves excavation to expose underground services, the requirements of Clauses 4.4 and 5.1.2.2 of SABS 1200 D (as amended) shall also apply.

The aforesaid procedure shall also be followed in respect of services not shown on the plans but which may reasonably be anticipated by an experienced Contractor to be present or potentially present on the Site.

All services, the positions of which have been determined as aforesaid at critical points, shall henceforth be designated as “Known Services” and their positions shall be indicated by the Contractor on a separate set of Drawings, a copy of which shall be furnished to the Engineer without delay.

As soon as any service which has not been identified and located as described above is encountered on, under, over or within the Site, it shall henceforth be deemed to be a “Known Service” and the aforesaid provisions pertaining to locating, verifying and recording its position on the balance of the Site shall apply. The Contractor shall notify the Engineer immediately should any such service be encountered or discovered on the Site.

Whilst it is in possession of the Site, the Contractor shall be liable for all loss of or damage as may occur to:

- (a) Known Services, anywhere along the entire lengths of their routes, as may reasonably be deduced from the actual locations at which their positions were verified as aforesaid, due cognisance being taken of such deviations in line and level which may reasonably be anticipated; and
- (b) any other service which ought reasonably to have been a Known Service in accordance with the provisions of this Clause;

as well as for consequential damage, whether caused directly by the Contractor's operations or by the lack of proper protection ; provided always that the Contractor will not be held liable in respect of damages occurring to services not being Known Services.

No separate payment will be made to the Contractor in respect of any costs incurred in preparing and submitting to the Engineer, the Drawings as aforesaid and these costs shall be deemed included in the Contractor's other tendered rates and prices included in the Contract.

Payment to the Contractor's in respect of exposing services at the positions agreed by the Engineer and as described above will be made under the payment items (if any) as may be provided therefore in the respective sections of the Specifications pertaining to the type of work involved.

PSA 5.4.2 Protection during construction

The Contractor shall take all reasonable precautions and arrange its operations in such a manner as to prevent damage occurring to all known

services during the period which the Contractor has occupation and/or possession of the Site.

Services left exposed shall be suitably protected from damage and in such a manner as will eliminate any danger arising there from to the public and/or workmen, all in accordance with the requirements of the prevailing legislation and related regulations.

PSA 5.4.3 Alterations and repairs to existing services

Unless the contrary is clearly specified in the Contract or ordered by the Engineer, the Contractor shall not carry out alterations to existing services. When any such alterations become necessary, the Contractor shall promptly inform the Engineer, who will either make arrangements for such work to be executed by the owner of the service, or instruct the Contractor to make such arrangements himself.

Should damage occur to any existing services, the Contractor shall immediately inform the Engineer, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases, the Contractor shall take appropriate steps to minimise damage to and interruption of the service. No repairs of telecommunication cables or electric power lines and cables shall be attempted by the Contractor, unless approved by the Engineer.

The Employer will accept no liability for damages due to a delay in having alterations or repairs effected by the respective service owners. The Contractor shall provide all reasonable opportunity, access and assistance to persons carrying out alterations or repairs of existing services."

PSA 5.7 SAFETY

Replace the contents of subclause 5.7 with the following:

"Pursuant to the provisions of the Conditions of Contract, and without in any way limiting the Contractor's obligations there under, the Contractor shall at his own expense (except only where specific provision (if any) is made in the Contract for the reimbursement to the Contractor in respect of particular items), provide the following:

- (a) Provide to its Employees on the site of the works, all safety materials, clothing and equipment necessary to ensure full compliance with the provisions of the Occupational Health and Safety Act (Act No 85 of 1993) and associated Regulations as amended (hereinafter referred to as the Act) at all times, and shall institute appropriate and effective measures to ensure the proper usage of such safety materials, clothing and equipment at all times; and

- (b) Provide, install and maintain all barricades, safety signage and other measures to ensure the safety of workmen and all persons in, on and around the site, as well as the general public; and
- (c) Implement on the site of the works, such procedures and systems and keep all records as may be required to ensure compliance with the requirements of the Act at all times; and
- (d) Implement all necessary measures so as to ensure compliance with the Act by all subcontractors engaged by the Contractor and their employees engaged on the works; and
- (e) Full compliance with all other requirements pertaining to safety as may be specified in the Contract.

The Employer shall in terms of the Regulations make such inspections on the site, as they shall deem appropriate, for the purpose of verifying the Contractor's compliance with the requirements of the Act. For this purpose, the Contractor shall grant full access to the site of all parts of the site and shall co-operate fully in such inspections and shall make available for inspection all such documents and records as the Employer's representative may reasonably require.

Where any such investigations reveal, or where it comes to the Employer's attention that the Contractor is in any way in breach of the requirements of the Act or is failing to comply with the provisions of this clause, the Engineer shall, in accordance with the provisions of Clause 5.11 of the Conditions of Contract, be entitled to suspend progress on the works or any part thereof until such time as the Contractor has demonstrated to the satisfaction of the Employer, that such breach has been rectified.

The Contractor shall have no grounds for a claim against the Employer for extension of time and/or additional costs if the progress on the works or any part thereof is suspended by the Engineer in terms of this clause, and the Contractor shall remain fully liable in respect of the payment of penalties for late completion in accordance with the provisions of Clause 5.13 of the Conditions of Contract should the Contractor fail to complete the Works on or before the specified due completion date in consequence of the suspension.

Persistent and repeated breach by the Contractor of the requirements of the Act and/or this clause shall constitute grounds for the Engineer to act in terms of Clause 9.12 of the Conditions of Contract and for the Employer to terminate the Contract in accordance with the further provisions of the said Clause 55."

"PSA 5.9* MAINTAINING SERVICES IN USE

The Contractor shall take note that he shall not cut off any service in use without the prior approval of the Engineer and the knowledge of the residents. Further, no existing services in use shall remain cut off for more than 8 hours or overnight.

Failure on the part of the Contractor to comply with any of the above provisions will constitute sufficient reason for the Engineer to stop the works until the situation has been remedied, or should he deem it necessary, arrange for the situation to be remedied at the Contractor's cost.

No direct payment will be made for the cost of maintaining services in use. Payment will be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the Contract."

"PSA 5.10* DEALING WITH AND ACCOMMODATING TRAFFIC

The Contractor shall take note that the existing roads and pedestrian walkways within the Site, shall remain operational throughout the contract period as set out earlier in the document. To this end the Contractor shall provide and maintain all temporary fences, security, barriers, kerb ramps, signs, markings, flagmen, drums, lighting, personnel and all other incidentals necessary to ensure safe and easy passage of all traffic.

Traffic accommodation and signage shall be erected and maintained by the Contractor and the number and layout of the traffic signs shall comply with the South African Development Community's South African Road Traffic Signs Manual, Volume 2 – Chapter 13, Roadworks Signing.

Traffic signs shall have a yellow background with either a red / black border.

No direct payment will be made for the cost of dealing with and accommodating traffic. Payment will be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the contract. Further, the provision of PSA 5.2 shall apply."

"PSA 5.11* SITE MEETINGS

The Contractor or its authorised agent will be required to attend regular site meetings, which shall normally be held once a month on dates and at times determined by the Engineer, but in any case whenever reasonably required by the Engineer. Unless otherwise indicated in the Contract or instructed by the Engineer, such meetings shall be held at the Contractor's offices on the Site. At such monthly meetings, matters such as general progress on the Works, quality of work, problems,

claims, payments, and safety etc, shall be discussed, but not matters concerning the day-to-day running of the Contract.

“PSA 5.12* PROVIDING ACCESS TO ERVEN AND PROPERTIES

Access to erven and properties along the route of trenches and roads shall be provided by the Contractor at all times as indicated earlier in the document. To this end suitable crossings shall be constructed where required.

Temporary crossings shall be in the form of portable bridges, temporary backfill or other approved means and shall be capable of permitting the safe passage of all vehicles and pedestrians. The Contractor shall also be responsible for maintaining crossings and for removing same when they are no longer required.

If as a result of restricted road reserve widths and the nature of the Works the construction of bypasses is not feasible, construction shall be carried out under traffic in order to provide access to the properties.

The Contractor may, with the approval of the Engineer, arrange with the occupiers of the affected properties to temporarily close off a portion of a road, footpath entrance, property access road or other access, provided that the Contractor shall give due notice of the intended closure and its probable duration to the occupiers and shall as punctually as possible re-open the route at the prescribed time. Where possible, roads shall be made safe and re-opened to traffic overnight. Any such closure shall be an arrangement between the Contractor and the occupiers and shall not absolve the Contractor from his obligations under the Contract to provide access at all times. Barricades, traffic signs and drums shall be provided by the Contractor to suit the specific conditions.

No direct payment will be made for the cost of providing access. Payment will be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the Contract.”

“PSA 5.13* ACCOMMODATION OF OTHER CONTRACTORS

The Contractor shall be required to accommodate other contractors on the Site of the Works during the entire Contract period.

Adequate access to the site of their works shall be given the contractors at all times.

No direct payment will be made for the cost of providing adequate access and accommodating the stated contractors on the Site of the Works, as well as the cost of any inconvenience or disruption experienced in attending to the aforementioned. Payment shall be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the Contract.

“PSA 5.14* ENVIRONMENTAL MANAGEMENT PLAN, RECORD OF DECISION AND SPECIFICATIONS

The Contractor shall be required to comply with and assume responsibility for compliance with the National Environmental Management Act, (Act 107 of 1998) in respect of the execution and completion of the Works.

Non-compliance in any way whatsoever will be adequate reason for the suspension of the Works.

No extension of time will be considered for delays due to non-compliance with the abovementioned.

No direct payment will be made for the cost of complying with the above-mentioned or disruption experienced in attending to the aforementioned. Payment shall be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the Contract. (Refer also to the contents of Clause 4.3 of the Conditions of Contract.”

PSA 6 TOLERANCES**"PSA 6.4* USE OF TOLERANCES**

No guarantee is given that the full specified tolerances will be available independently of each other, and the Contractor is cautioned that the liberal or full use of any one or more of the tolerances may deprive him of the full or any use of tolerances relating to other aspects of the work.

Except where the contrary is specified, or when clearly not applicable, all quantities for measurement and payment shall be determined from the 'authorized' dimensions. These are specified dimensions or those shown on the Drawings or, if changed, as finally prescribed by the Engineer, without any allowance for the specified tolerances. Except if otherwise specified, all measurements for determining quantities for payment will be based on the 'authorized' dimensions.

If the work is constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the calculation of quantities will be based on the 'authorised' dimensions, regardless of the actual dimensions to which the work has been constructed.

When the work is not constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the Engineer may nevertheless, at his sole discretion, accept the work for payment. In such cases no payment shall be made for quantities of work or material in excess of those calculated for the 'authorised' dimensions, and where the actual dimensions are less than the 'authorised' dimensions minus the tolerance allowed, quantities for payment shall be calculated based on the actual dimensions as constructed."

PSA 7 TESTING**PSA 7.1 PRINCIPLES****PSA 7.1.2 Standard of Finished Work Not to Specification**

Insert the words "or checks by an approved laboratory ..." after the words "Where the Engineer's checks ..." in the first line of Clause 7.1.2.

PSA 7.2 APPROVED LABORATORIES

Replace the contents of Clause 7.2 with the following:

"Unless otherwise specified in the relevant specification or elsewhere in the Scope of Work, the following shall be deemed to be approved laboratories in which design work, or testing required in terms of a specification for the purposes of acceptance by the Engineer of the quality of materials used and/or workmanship achieved, may be carried out:

- (a) any testing laboratory certified by the South African National Accreditation Systems (SANAS) in respect of the nature and type of testing to be undertaken for the purposes of the Contract;
- (b) any testing laboratory owned, managed or operated by the Employer or the Engineer;
- (c) any testing laboratory established and operated on the Site by or on behalf of the Employer or the Engineer;
- (a) any testing laboratory designated by the Engineer.”

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.1 MEASUREMENT

PSA 8.1.1 Method of measurement, all sections of the Schedule

Delete the words "and South-West Africa".

PSA 8.1.2 Preliminary and General item or section

PSA 8.1.2.1 Contents

Replace the contents of item (c) with the following:

"The 'duration of construction' applicable to a time-related item shall be the tendered contract period for the total works, plus as applicable, the Civil, Mechanical and Electrical Engineering Industry Holiday (Dec / Jan) and all gazetted public holidays for the Engineering Industry."

PSA 8.1.2.2 Tendered sums

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

"Except only where specific provision is made in the Specifications and/or the Bill of Quantities for separate compensation for any of these items, the Contractor's tendered sums under items PSA 8.3.1 and PSA 8.4.1 shall collectively cover all charges for:

- risks, costs and obligations in terms of the Conditions of Contract and of this standardized specification; and
- head-office and site overheads and supervision; and
- profit and financing costs; and
- expenses of a general nature not specifically related to any item or items of the permanent or temporary work; and
- providing such facilities on site as may be required by the Contractor for the proper performance of the Contract and for its personnel, including, but without limitation, providing offices, storage facilities, workshops, ablutions, services such as water, electricity, sewage and rubbish disposal, access roads and all other facilities required, as well as for the maintenance and removal on completion of the works of these facilities and cleaning-up of the site of the Contractor's establishment and reinstatement to not less than its original condition, and
- providing the facilities for the Engineer and his staff as specified in the Contract and their removal from the site on completion of the Contract."

PSA 8.2 PAYMENT**PSA 8.2.2 Time-related items**

Replace the contents of Clause 8.2.2 with the following:

"Subject to the provisions of sub clauses 8.2.3 and 8.2.4, payment under item 8.4.1 (time-related item) will be made monthly in equal amounts, calculated by dividing the sum tendered for the item by the tendered Contract period in months, provided always that the total of the monthly amounts so paid for the item is not out of proportion to the value of the progress of the Works as a whole.

Should the Engineer grant an extension of time for the completion of the total works, the Contractor will be entitled to an increase in the sums tendered for time-related items, which increase shall be in the same proportion to the original tendered sums, as the extension of time is to the duration of construction as defined in PSA 8.1.2.1. The Contractor shall however note that the aforementioned will not apply to extensions of time granted in terms of PSA 8.4.6.

Payment of such increased sums will be taken to be as full compensation for all additional preliminary and general costs, either time-related costs or fixed costs that result from the circumstances pertaining to the extension of time granted."

The payment to the Contractor for Time-Related Items shall be adjusted in accordance with the following formula in the event of the Contract being extended by means of a Variation Order:

Sum of Tendered amounts for Time Related Items x

Extension of Time authorised by Variation Order
Tender Contract period

For the purposes of applying this formula "Extension of Time" will exclude the Contractor's December / January close-down period, if applicable.

The abovementioned adjustment of the payment for Time-Related Items shall be made in the completion Payment Certificate and shall be the only payment for additional Time-Related costs irrespective of the actual period required to complete the Contract including its authorised extensions.

In the case of fixed price contracts, the amount by which the Time-Related Items is adjusted shall not be subject to the Contract Price Adjustment formula. Similarly, in the case of contracts subject to Contract Price Adjustment the amount by which the time-related items are adjusted shall be subject to the Contract Price Adjustment formula."

PSA 8.3 SCHEDULED FIXED-CHARGE AND VALUE RELATED ITEMS

PSA 8.3.1 Contractual requirements

Add the following:

"The sum tendered shall cover all costs incurred in complying with the requirements of the Conditions of Contract, the Scope of Work as well as the fixed costs applicable to the obligations and requirements applicable to the Micro Enterprises Subcontract work as detailed under C3.3: Procurement and C3.5 Management of Part 3: Scope of Work, including the calling and evaluations of such tenders.

Where applicable in terms of the Contract, the sum tendered shall include for the cost of providing and maintaining the special risks insurance stipulated in the Conditions of Contract."

PSA 8.3.2.1 Facilities for Engineer

Replace the contents of this Clause with the following:

"(a) Two Contract NameboardsUnit: Sum
(b) Engineers OfficesUnit: Sum

The facilities provided shall comply with the applicable requirements of SABS 1200 AB and PSAB."

PSA 8.3.2.2 Facilities for Contractor

Notwithstanding the detail breakdown of items provided (items a to j), a single sum shall be tendered to cover all these items under the heading of "Facilities for Contractor" and shall include facilities for the Subcontractors.

PSA 8.3.3 Other Fixed-charged Obligations

Add the following:

"The sum tendered shall in addition cover the fixed costs of all obligations and requirements applicable to the subcontract work as detailed under C3.3: Procurement and C3.5 Management of Part 3: Scope of Work."

PSA 8.4 SCHEDULED TIME RELATED ITEMS

PSA 8.4.1 Contractual requirements.....Unit: Sum

Add the following:

"The sum tendered shall cover all costs incurred in complying with the requirements of the Conditions of Contract, the Scope of Work as well as any time-related costs applicable to the obligations and requirements applicable to the Subcontract work as detailed under C3.3: Procurement and C3.5 Management of Part 3: Scope of Work, including the calling and evaluations of such tenders.

Where applicable in terms of the Contract, the sum tendered shall include for the cost of providing and maintaining the special risks insurance stipulated in the Conditions of Contract.

The sum shall further cover all the time-related establishment costs and be the full compensation to the Contractor for:

- (i) The maintenance of his whole organisation as established for this Contract.
- (ii) The maintenance of all insurances, indemnities and guarantees required in terms of the Conditions of Contract, where applicable.
- (iii) Compliance with all general conditions and requirements which are not specifically measured elsewhere for payment in these Contract Documents.

Payment shall be made monthly in compliance with the method laid down in PSA 8.2.2.

The Contractor will not be paid Time-Related Preliminary and General Charges for any special non-working days, as stipulated in the Conditions of Contract, which shall be deemed to have been allowed for within his rates."

PSA 8.4.2.1 Facilities for Engineer

Replace the contents of this Clause with the following:

- "(a) Two Contract Nameboards..... Unit: Sum
- (b) engineers Offices.....Unit:Sum

The facilities provided shall comply with the applicable requirements of SABS 1200 AB and PSAB.

Payment for the provision of survey labourers will be made pro-rata the period the labourers are provided."

PSA 8.4.2.2 Facilities for Contractor

Notwithstanding the detail breakdown of items provided (items a to j), a single sum shall be tendered to cover all these items under the heading of "Facilities for Contractor" and shall include facilities for the Subcontractors.

PSA 8.4.2.3 Replace the words "periods stated" in the second line of this Clause with the following:

"duration of construction as defined in PSA 8.1.2.1".

PSA 8.4.5 Other Time-related Obligations

Add the following:

"The sum tendered shall in addition cover the time-related costs of all obligations and requirements applicable to the subcontract work as detailed under C3.3 Procurement and C3.5 Management of Part 3: Scope of Work."

"PSA 8.4.6* Compensation in terms of Subclause 5.12.2.4 and Clause 9.1 of the Conditions of Contract for delays incurred:

- (a) PlantUnit: Sum per working day
- (b) Labour.....Unit: Sum per working day
- (c) SupervisionUnit: Sum per working day
- (d) Other services, facilities etc. not covered by
 (a), (b) and (c).....Unit: Sum per working day

The sum tendered for each item shall cover the full and final standing cost per day of delaying the specified resource or facility and no additional compensation shall apply, notwithstanding any provisions to the contrary in the contract documents, or in respect of any extension of time granted in relation to the circumstances described in Subclauses 5.12.2.4 and 9.1 of the Conditions of Contract.

For the purposes of calculating the total delay, a working week shall be held to consist of five working days and a working day 9 hours.

Payment for the partial standing of any of the scheduled resources for a day or part thereof, or the standing of a complete resource for a part day, will be made pro-rata in proportion to an appropriate factor assessed by the Engineer.

The amount by which compensation for delays is adjusted shall be subject to the contract price adjustment formula as defined in the Conditions of Contract.

This payment item shall only apply to delays which in the opinion of the Engineer are due to the circumstances described in Subclauses 5.12.2.4 and 9.1 of the Conditions of Contract. No Payment will be made for any salary related or other internally caused strikes. The cost of delays incurred for all other circumstances shall be treated as provided for in the Conditions of Contract.

The provision of this Clause shall in no way prejudice the right of either the Employer or the Contractor to determine the Contract in terms of the provisions of Clause 9.1 of the Conditions of Contract.

The Contractor shall take note that no payment will be considered for any additional cost incurred in protecting his plant and site establishment, as well as for costs incurred in respect of damage to constructional plant and equipment."

PSA 8.5 SUMS STATED PROVISIONALLY BY THE ENGINEER

Replace the contents of Clause 8.5 with the following:

"PSA 8.5.1 Works Executed by the Contractor Unit: Prov Sum

Note that these Provisional Sums are allocated for anticipated work that must be executed by the Contractor and which, at tender stage, could not have been determined or quantified. Refer Clause 6.6 of the Conditions of Contract.

The work identified and stated will not constitute a variation in terms of the Contract although the value of such work will be determined in accordance with the principals pertaining to the value of a Variation Order as set out in Clause 6.4 of the Conditions of Contract.

The Contractor will be reimbursed in substitution of the Provisional Sums (if any) allowed in the Bill of Quantities for work to be executed by the Contractor, in the amounts determined in accordance with the provisions of Clauses 6.4 and 6.6.1 of the Conditions of Contract.

The description of the payment item in the Bill of Quantities will specify and dictate the work to be executed."

"PSA 8.5.2* Additional testing required by the Engineer.... Unit : Provisional Sum

The provisional sum provided in the Schedule of Quantities is to cover the payment of the SANAS registered soils Laboratory to conduct CBR, MOD's and Atterberg Limit tests as directed by the Engineer."

PSA 8.5.3* Overhead, charges, profit etc on item PSA 8.5.2 Unit : %

The percentage tendered shall be paid to the Contractor on the actual amount paid to the soils laboratory and shall cover the following:

- all costs involved in rectifying and arranging the tests with the laboratory.
- setting out the positions for the tests to be taken by the laboratory as indicated by the Engineer.
- making good all test holes with subbase.
- the cost of all overheads, charges and profits

“PSA 8.6 PRIME COST ITEMS

PSA 8.6.1 Prime Cost Sums

- (a) Description of Item to which Prime Cost Sum Applies Unit: PC Sum
- (b) Charge Required by Contractor on Sub-item (a) above Unit: %

Refer Clause 6.6 of the Conditions of Contract.

Sub-items (a) and (b) will be provided in the Bill of Quantities for each different item to which a Prime Cost Sum applies.

The Contractor shall be reimbursed under sub-item(s) (a) in substitution of the respective Prime Cost Sums included in the Contract, the actual price(s) paid or payable by him in respect of the goods, materials or services supplied, but excluding any charges for the Contractor's labour, profit, carriage, establishment or other charges related to such goods, services or materials, all in accordance with the provisions of Clause 6.6.2 of the Conditions of Contract.

The description of the payment item in the Bill of Quantities will specify and dictate the work to be executed.

The Contractor shall be paid under sub-item (b), the respective percentage, as stated by the Contractor in its Tender, of the amount certified by the Engineer for payment under the related sub-item (a). The percentages tendered by the Contractor for each respective sub-item (b) included in the Bill of Quantities shall be deemed to in full and final compensation to the Contractor in respect of any charge by the Contractor for labour, carriage profit, establishment and for any other charges related to the goods, services or materials supplied under the related sub-item (a).

If the Contractor shall have omitted within its Tender to insert a tendered percentage under sub-item (b), or tendered a zero percentage, the Contractor's tendered rate for sub-item (b) shall be deemed to be zero and the Contractor shall not be entitled to any payment under sub-item (b).

Only payments for successful test will be made under the Prime Cost Sum provided in the Bill of Quantities for acceptance control testing by the Engineer.

The Contractor is responsible for the cost of all process control testing. Payment in terms of the above will only be made for acceptance control testing specifically ordered and specified by the Engineer."

"PSA 8.7 DAYWORK

Add the following:

"To ensure that the plant is achieving a reasonable output of work, the Engineer's personnel will randomly monitor and measure work produced. Poor performance of any item of plant will be noted by the Engineer and certain reductions in payment may be applied.

Furthermore, should the performance of a machine be poor, or persistently break down, the Engineer may order that it be replaced, all at the cost of the Contractor."

PSA 8.8 TEMPORARY WORKS

PSA 8.8.2 Dealing with Traffic

Delete the entire Clause. The provision of PSA 5.10 shall apply. Refer also PSA 5.2, PSA 5.3, PSA 5.7 and PSA 5.12"

PSA 8.8.4 Existing services

Replace the heading of paragraph (c) with the following:

"c) Excavate by hand in soft material to expose existing services Unit: m³

Add the following:

"The rate tendered for (c) shall further cover the cost of backfilling the excavation with excavated material compacted to 90% of modified AASHTO maximum density, loading, transporting within a free haul distance of 0,5 km and disposing of surplus material as directed, keeping the excavation safe, dealing with water, protecting the exposed services, and any other operation necessary to complete the work.

No distinction will be made between the various types of services to be exposed, or the depths to which excavations are taken.

Excavation in excess of that authorised will not be measured for payment."

PSA 8.8.5 Cost of survey in terms of Land Survey Act

Replace the contents of subclause 8.8.5 with the following:

"(a) Locate, record and protect erf boundary and survey pegs Unit: Sum

The sum tendered shall cover the cost of complying with the requirements of 5.1.2 and PSA 5.1.2 as well as the cost of exposing and marking the pegs on completion of the Works.

(b) Replace pegs recorded as missing at commencement of Contract as well as pegs removed in terms of PSA 5.1.2 (a), (b) and (c) Unit: No

The rate tendered shall cover the cost of arranging for a registered surveyor to replace the pegs, as well as the payment of the surveyor. The Contractor shall however note that pegs recorded as missing at the start of the work and subsequently found by the surveyor to be in their correct position will not be measured for payment.

NOTE:

The cost to set out the Works in terms of 5.1.1 and PSA 5.1.1 shall be deemed to be covered by the sums tendered for other obligations under Subclauses 8.3.3 and 8.4.5."

"PSA 8.8.7* Compliance with the occupational health and safety act (Act 85 of 1993) and all relevant and applicable regulations, especially the construction regulations, 2014 as promulgated on 7 February 2014 under Section 43 of the occupational health and safety act (Act 85 of 1993), as amended from time to time, for the duration of the contract

(a) Contractor Unit: Sum

(b) Subcontractors (own) / Micro Enterprises (smme's) Unit: Sum

The tendered sums shall include full compensation to the Contractor for compliance with all the requirements of the OHS Act and the Construction Regulations 2014 at all times, as described in the Scope of Work and Employer's health and safety specification (Refer Particular Specification PA). The successful tenderer shall provide the Engineer with a complete breakdown of each tendered sum, if so required.

The Contractor shall note that all obligations contained in the Act, Regulations and Employers health and safety specification shall be included in this item. No additional claims will be considered; neither will an extension of time be considered for delays due to non-compliance with the Contractor's health and safety plan.

The sums will be paid to the Contractor in equal monthly amounts.

Refer also PSA 5.2, PSA 5.3, PSA 5.7 PSA 5.10, PSA 5.12, PSA 5.13 and PSA 5.14"

PSAB ENGINEER'S OFFICE

PSAB 3 MATERIALS

PSAB 3.1 NAMEBOARDS

Notwithstanding the provisions of this Sub-Clause, two Contract Nameboards shall be provided. The nameboards shall further comply with regard to size, painting, decorating and detail as detailed on the drawings.

PSAB 3.2 OFFICE BUILDING(S)

Add the following after "Engineer." in the second last sentence:

"The Engineer will require an office, as follows :

- At least 15 m²
- One desk
- 3 chairs
- Two lights
- Air conditioner
- 2 electric plugs
- One car port"

PSAB 4 PLANT

PSAB 4.1 TELEPHONE

A telephone for the Engineer's use is not required.

PSAB 5 CONSTRUCTION

PSAB 5.1 NAMEBOARDS

Replace the contents of this Clause with the following:

"The Contract Nameboard shall be erected within fourteen days of the Commencement Date and shall be placed where ordered. Any damage to this board shall be repaired within seven days of a written instruction issued by the Engineer.

Further to the above the Contractor will not be allowed to erect more than two of his own nameboards in the area of the Works. The position of these shall be agreed to by the Engineer. No payment will be made for the supply, erection or maintenance of the Contractor's nameboards and the Engineer reserves the right to order the removal of the nameboards if not properly maintained.

All nameboards shall be removed within 7 days of the issue of the "Certificate of Completion".

PSAB 5.4 TELEPHONE

Delete the entire contents of this Clause.

PSAB 5.5 SURVEY ASSISTANTS

A survey assistant will be required from time to time to assist the Engineer's Representative.

PSAB 8 MEASUREMENT AND PAYMENT

Delete the contents of this Clause. The appropriate measurement and payment clauses have been included under Clause 8 of SABS 1200 A and PSA.

PSC SITE CLEARANCE

PSC 3 MATERIALS

PSC 3.1 DISPOSAL OF MATERIAL

Delete the first two sentences of this clause and replace with:

“Debris arising from clearing and grubbing operations or from the demolition of structures on site shall be removed by the Contractor and disposed of at any approved tip site.

The rates tendered for the various items under this section shall further cover the cost of loading, transporting and disposing of material at the approved tip site as well as for any fees payable.”

PSC 5 CONSTRUCTION

PSC 5.3 CLEARING

Add the following after subclause f):

“g) The clearing, breaking up, removal and spoiling of all concrete, brick-paved or bitumen surfaced slabs, walkways and roadways as well as any obstructions, concrete edging, slabs, playground equipment, bollards and other unwanted debris within the road verges and park areas.”

PSC 5.5 RECLEARING OF VEGETATION

Add the following:

“Except if otherwise agreed, where areas have to be re-cleared on the written instruction of the Engineer, such re-clearing shall be carried out at the Contractor’s own cost and the Contractor is advised therefore, not to clear areas at such an early stage that re-clearing may become necessary.”

PSC 8 MEASUREMENT AND PAYMENT

PSC 8.1 BASIC PRINCIPLES

Add the following:

“The thickness layer that will unavoidably be stripped during clearing of vegetation will be taken as 100mm.

This implies that levels used in earthworks quantity calculations shall be 100mm lower than the original levels excluding stripping of topsoil to stockpile, where applicable.”

Levels to be used for earthworks quantity calculations will be surveyed once the clearing operations have been completed."

PSC 8.2 PAYMENT

PSC 8.2.1 Clear and grub

Replace the first line with the following:

"The areas designated by the Engineer to be cleared and grubbed will be measured in square metre or to the nearest square metre or,"

Delete "(except where 8.2.9 is applicable)" in the seventh line of this Clause.

Add the following:

"The tendered rate shall also cover the cost of loading, transporting and disposing of all rubble, spoil and other unwanted debris encountered in the parks, road reserves or along service routes, irrespective of distance. (Refer also PSC 8.1)"

PSC 8.2.8 Demolish and remove structures / buildings and dismantle steelwork, etc.

Add the following:

"The sum tendered shall cover all costs for the provision of labour, equipment and incidentals necessary to demolish, remove, transport and dispose of the scheduled structures / buildings, including foundations, at an approved tip site."

PSC 8.2.9 Transport material and debris to unspecified sites and dump

Delete this subclause.

Notwithstanding the fact that a disposal site will not be designated by the Engineer, the transportation of all material and debris generated by any clearing and grubbing operations, will not be measured for payment."

"PSC 8.2.11*Remove and dispose of existing concrete kerbing and channelling combination.....Unit : m

The rate tendered shall cover the provision of all labour and equipment necessary to remove, transport and dispose of existing concrete kerbing and channelling combination, including backing and screed, at an approved tip site, regardless of volume and the type kerbing.

PSC 8.2.12* Remove and dispose of existing concrete kerbing Unit: m

The rate tendered shall cover the provision of all labour and equipment necessary to remove, transport and dispose of existing concrete kerbing, including backing and screed, at an approved tip site, regardless of volume and the type kerbing.

PSC 8.2.13* Saw-cut asphalt surfacing Unit: m

The rate tendered shall cover the provision of all labour and equipment necessary to saw-cut asphalt surfacing to a minimum depth of 50 mm.

**PSC 8.2.14* Remove and dispose of existing asphalt and bituminous surfacing
Unit: m²**

The rate tendered shall cover the provision of all labour and equipment to remove, transport and dispose of all existing asphalt and bituminous surfacing at the approved tip site (saw-cutting will be compensated for under item PSC 8.2.13).

Where existing bituminous sidewalks are retained with concrete edge strips, the rate under this item shall include for the removal and spoiling of such.

No separate payment will be made under PSC 8.2.12.

PSC 8.2.15* Saw-cut concrete in roadway / sidewalks Unit: m

The rate tendered shall cover the provision of all labour and equipment to saw-cut concrete surfacing to a minimum depth of 250 mm.

PSC 8.2.16* Remove and dispose of concrete surfacing (up to a thickness of 250 mm) Unit: m²

The tendered rate shall cover the provision of all labour and equipment to remove, transport and dispose of concrete surfacing at the approved tip site (saw-cutting will be compensated for under item PSC 8.2.16).

PSC 8.2.17* Remove and dispose of existing brickwork (up to a thickness of 300 mm) Unit: m²

The sum tendered shall cover the provision of all labour and equipment to remove on the instruction of the Engineer, transport and dispose of existing brickwork at the approved tip site.

The rate shall be based on brickwork with a wall thickness of 300 mm."

PSD EARTHWORKS

PSD 2 INTERPRETATIONS

PSD 2.1 SUPPORTING SPECIFICATIONS

Replace Clause 2.1.2 with the following:

"PSD 2.1.2: Any of the other SABS 1200 Specifications or Particular Specifications may form part of the Contract Documents."

PSD 2.3 DEFINITIONS

Replace the word and the definition for "borrow" with the following:

"Borrow material: Material, other than material obtained from excavations required for the Works, obtained from sources such as borrow pits or the authorised widening of excavations. 'Borrow' shall have a corresponding meaning."

Replace the definition for "specified density" with the following:

"Specified density: The specified dry density expressed as a percentage of modified AASHTO dry density."

Replace the definition for "stockpile" with the following:

"Stockpile (verb): The process of selecting and, when necessary, loading, transporting and off-loading material in a designated area for later use for a specific purpose."

Add the following definitions:

"Commercial Source: A source of material provided by the Contractor, not the Employer, and including any borrow pit, provided by the Contractor."

Fill: An embankment or terrace constructed of material obtained from excavations or borrow pits.

Fill (material): Material used for the construction of an embankment or terrace.

Roadbed: The natural in situ material on which the fill, or in the absence of fill, the pavement layers, are constructed."

PSD 3 MATERIALS

PSD 3.1 CLASSIFICATION FOR EXCAVATION PURPOSES

PSD 3.1.1 Method of Classifying

Add the following:

"The classification of material other than 'soft excavation' shall be agreed upon before excavation may commence.

The Contractor shall immediately inform the Engineer if and when the nature of the material being excavated changes to such an extent that a new classification is warranted for further excavation. Failure on the part of the Contractor to advise the Engineer in good time shall entitle the Engineer to reclassify, at his discretion, such excavated material."

PSD 3.1.2 Classes of excavation

Notwithstanding the provisions of this subclause no distinction will be made between soft and intermediate excavation. All excavation, other than in hard rock and boulder excavation, shall for measurement and payment purposes be classified as soft excavation.

PSD 3.2.1 Material suitable for embankments and terraces

Add the following to paragraph (b):

Provided sufficient fines are mixed with the rock to ensure a dense compacted mass can be achieved.

PSD 3.2.3 Material Suitable for Backfill or Fill against Structures

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

"Material used for backfill behind structures shall generally be the material excavated, subject to the following conditions:

- (a) The material shall not contain an excessive number of stones retained on a 50 mm sieve; and
- (b) The material shall not contain large clay lumps that do not break up under the action of the compaction equipment; and
- (a) The liquid limit of the material shall not exceed 40, neither shall the PI exceed 18.
- (b) The minimum compaction shall be 93% of modified AASHTO maximum density."

PSD 3.3 SELECTION

PSD 3.3.1 General

Replace the second paragraph with the following:

"The Contractor shall deal selectively with materials from all excavations to ensure that no acceptable backfill or bedding material is contaminated by material unfit for use. No additional payment shall be made in this regard and all costs related to the above selection process shall be included in the applicable payment items. Should useful material be contaminated to such an extent that it is regarded as unfit for use the Contractor shall at his own cost dispose of this material and replace it with material of an equivalent standard to the acceptable in situ material."

PSD 3.3.2 Backfilling and embankments

With reference to the last line of this subclause the material to be used for backfill shall be either 15MPa/19 concrete or material complying with 3.2.2 compacted in 150mm layers to 90% of modified AASHTO maximum density, as ordered on site.

"PSD 3.3.3* Selection in Excavations and Borrow Pits

Approval of a borrow area for a certain purpose does not necessarily mean that all the material in that area is suitable for the specified purpose. It does mean that the borrow area contains some suitable material. The onus shall rest on the Contractor to ensure that only material that is indeed suitable is removed and used for the specified purpose.

When the Contractor has to select excavated material for a specific purpose, the above provisions relating to borrow areas shall apply *mutatis mutandis* to excavations.

The Contractor shall not waste or contaminate material that has been selected for a specific purpose."

PSD 4 PLANT

PSD 4.4 DETECTORS

Replace the contents of Clause 4.4 with the following:

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

PSD 5 CONSTRUCTION

PSD 5.1 PRECAUTIONS

PSD 5.1.1 Safety

PSD 5.1.1.1 Barricading and lighting

Replace "Machinery and Occupational Safety Act, 1983 (Act 6 of 1983)" with "Occupational Health and Safety Act, 1993 (Act 85 of 1993) and Construction Regulations 2014".

PSD 5.1.1.2 Safeguarding of excavations

Replace "Machinery and Occupational Safety Act" with "Occupational Health and Safety Act, 1993 (Act 85 of 1993) and Construction Regulations 2014".

Add the following to paragraph (b) (1):

"Payment for supporting the sides of excavations and trenches shall be deemed to be included in the rates tendered for excavations. No separate payment will be made in this regard and it will be the Contractor's responsibility to ensure the safety and stability of all excavations.

Where trenches have to be widened to accommodate manholes, junction boxes, etc., the cost of supporting the vertical sides of such additional excavations will be deemed to be included in the rates tendered for excavation."

Add the following to paragraph (b) (2):

"The slope of the sides of an excavation or trench may never be steeper than 60° to the horizontal and all costs incurred to slope the sides of an excavation or trench will, irrespective of the angle of the slope, be deemed to be included in the rates quoted for excavation."

PSD 5.1.1.3 Explosives

Replace the contents of this subclause with the following:

"No overbreak allowance shall apply to this Contract.

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

- (a) The Engineer may prohibit the use of explosives in cases where, in his opinion, the risk of injury to persons or damage to property or to adjoining structures is too high. Such action by the Engineer does

not entitle the Contractor to additional payment for having to resort to less economical methods of construction.

- (b) The Engineer's prior written approval shall be obtained for each and every blasting operation. This approval may be withheld if the Contractor does not use explosives responsibly and carefully.
- (c) The Contractor shall comply fully with the requirements of the Explosives Act, Act 83 of 1997 and all other legislation and regulations as may be applicable to blasting and the use of explosives.
- (d) Before blasting is undertaken, the Contractor shall satisfy the Engineer that he has established whether or not the insurers concerned require pre- and post-blasting inspections of buildings and structures within a certain radius of the proposed blasting.

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

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

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

PSD 5.1.2 Existing services

PSD 5.1.2.2 Detection, location and exposure

Replace the contents of Clause 5.1.2.2 with the following:

“The exposure by the Contractor of underground services, as required in terms of Clause 5.4 of SABS 1200 A and PSA 5.4 shall be carried out by careful hand excavation at such positions and to such dimensions as are agreed to by the Engineer.

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

(a) In roadways: 95% Mod AASHTO density; and

(b) In all other areas: 93% Mod AASHTO density.

Where hand excavations to expose underground services have to be carried out in roadways, the Contractor shall reinstate the road layerworks in accordance with the provisions of the Contract or as directed.

Payment in respect of the exposing of the services by means of hand excavation as described above shall be deemed to be covered by the rates tendered under items PSA 8.8.4(c).”

Payment in respect of the reinstatement of layerworks in road ways will be made in accordance with PSDB 8.3.6.1 and subclause 8.3.6.1 of SABS 1200 DB.”

PSD 5.1.2.3 Protection of cables

Replace Clause 5.1.2.3 with the following:

“5.1.2.3 Protection during Construction

Further to the requirements of PSA 5.4.2 and Subclause 5.4.2 of SABS 1200 A, major excavating equipment and other Plant shall not be operated dangerously close to Known Services. Where necessary, excavation in close proximity to Known Services shall be carefully carried out with suitable hand tools, excluding picks wherever their use could damage the services. **No additional payment will apply to such more difficult work.**

Should any service not being a Known Service be discovered or encountered during the course of the Contract, the Contractor shall, in addition to complying with the requirements of Sub-clause 5.4.2 of SABS 1200 A (as amended), immediately notify the Engineer thereof and

implement such measures as will prevent damage of such service or, if it was damaged in the course of discovery, will prevent and minimise the occurrence of any further damage occurring.”

PSD 5.1.2.4 Negligence

The Contractor shall not repair any service damaged. Where the damage is the result of the Contractor's negligence he shall bear all costs of the repairs undertaken by the owner, as well as the costs of associated damages.”

PSD 5.1.6 Road traffic control

Delete the contents of Clause 5.1.6 and replace with the following:

“The provisions of PSA 5.10 shall apply as applicable. Where the work affects the operation or safety of public road traffic, vehicular and/or pedestrians in addition, to complying with the requirements of 5.1.1.1, the Contractor shall provide, erect and maintain traffic signs, personnel and equipment that conform to the requirements, layout and guidelines of the “South African Road Traffic Signs Manual”, as well as the Site Manual entitled “Safety at Roadworks in Urban Areas” as published by the Department of Transport, in number and in layout, as shown in these manuals.

Where necessary and as shown in these manuals, warning lights, an adequate number of flagmen and appropriate barricades, clearly visible to oncoming traffic at all times of the day and night shall be provided. If steel drums are used for this purpose, they shall be ballasted with soil, sand or stones and the outside shall be whitewashed and provided with retro-reflective material (in the case of tape, of minimum width 10 mm), red on the left-hand side facing oncoming traffic and white on the right-hand side. The drums shall be maintained in a clean and effective condition and no stones shall be placed on them.

No direct payment will be made for the cost of providing and complying to the aforementioned. Payment will be deemed to be covered by the rates and sums tendered and paid for the various items of work included under the Contract.”

PSD 5.2 METHODS AND PROCEDURES**PSD 5.2.1 Site preparation****PSD 5.2.1.2 Conservation of topsoil**

Add the following:

“Topsoil ordered to be stripped and conserved for later use shall be stockpiled in a manageable heap where designated by the Engineer. The material together with such vegetation and small roots as may occur within the specified depth shall be stripped, loaded, transported to stockpile within a freehaul distance of 0,5 km, maintained and wetted (dust control) for the full duration of the Contract or until use.”

PSD 5.2.2 Excavation**PSD 5.2.2.1 Excavation for General Earthworks and for Structures**

Add the following to paragraph (b):

"When the nature of the material precludes the above procedure, additional excavations shall be carried out to provide working space for the erection of formwork. In general, payment will be made for excavating a working width of 600 mm, but the Contractor may excavate a greater working width at no additional cost to the Employer."

Replace the first sentence of paragraph (e) with the following:

"Where excavations have been carried below the authorised levels, the Contractor shall backfill such excavations to the correct level with approved gravel material compacted to 98% of modified AASHTO density or to the density of the surrounding material, whichever is the higher density.

Where excavations for structures have been carried out in hard material, the Engineer may direct that over-excavation be backfilled with weak concrete if there is a danger of settlement or differential settlement of the foundations.

Where the sides of excavations against which concrete is to be cast have been over-excavated or have collapsed partially, the Contractor shall re-trim the excavations if necessary and, unless other remedial measures are agreed to by the Engineer, shall cast the concrete for the structure, including the additional concrete that may be required as a result of the over-excavation or partial collapse. The cost of the additional concrete or remedial measures shall be for the Contractor's account."

PSD 5.2.2.3 Disposal

Replace the second sentence with the following:

"The Contractor shall provide necessary spoil sites for the spoiling of all surplus and unsuitable materials and shall make the necessary arrangements with the owner of the site where the material is disposed of and pay all charges and levies as may be applicable for the use of such spoil sites.

Every spoil site provided by the Contractor shall be approved by the local authority in whose area it is located and the spoiling shall comply with the applicable statutory and municipal regulations as well as the requirements of the owner of the spoil site.

No direct payment will be made for locating and making arrangements for suitable spoil sites and for the spoiling and haul of material at and to such

sites. Payment will be deemed to be covered by the various rates tendered and paid."

PSD 5.2.2.4* Selection and Stockpiling

Approval or designation of the material in a particular borrow pit or excavation for a particular purpose does not imply that all the material in the borrow pit or excavation is suitable for the particular purpose for which the said approval or designation relates, nor that all material in the borrow pit or excavation should be used for the particular purpose. The Contractor shall select suitable material from that borrow pit or excavation, discard unsuitable material and reserve material for other purposes as necessary.

The Contractor shall organise and carry out its operations in such a manner as will prevent the contamination of suitable embankment, fill and backfill material with unsuitable materials. Any excavated material which becomes, in the Engineer's opinion, unsuitable for use in embankments, fills or backfill as a result of contamination, shall be disposed of in a manner acceptable to the Engineer and shall be replaced by the Contractor with materials acceptable to the Engineer, all at the Contractor's cost.

When required, or when ordered by the Engineer, material shall be temporary stockpiled at sites indicated by the Engineer for later use. The additional costs of stockpiling material shall be paid to the Contractor in accordance with the provisions of Sub-clause PSD 8.3.14.

PSD 5.2.3 Placing and Compaction

PSD 5.2.3.1 Embankments

Replace the first sentence of the sixth paragraph with the following:

"Each layer shall be compacted at OMC to a density as specified and in the case of cohesive soil and 100% of modified AASHTO maximum density in the case of non-cohesive soil."

PSD 5.2.3.3* The material of each area of fill shall, unless otherwise approved, be deposited in layers of thickness, before compaction, not exceeding 150 mm. The material shall be spread to form a layer that is approximately uniform thickness, and graded over the whole area of the fill site.

Each layer shall be compacted at OMC to a density of at least 93% of modified AASHTO density in the case of cohesive soil or 100% in the case of non-cohesive soil. Should the material be too wet, owing to rain or any other cause, it shall be harrowed and allowed to dry out to the correct moisture content before compaction is undertaken.

The contractor shall ensure that stormwater will at all times be discharged uniformly over the full fill area or through specially prepared and protected drainage ditches to prevent scouring of the slopes."

"PSD 5.2.3.4 Backfilling over-excavation and overbreak

The material to be used shall comply with 3.2.1, except that the maximum particle size shall not exceed $\frac{2}{3}$ of the thickness of the layer being placed, and shall be compacted to at least 95% of modified AASHTO maximum density.

PSD 5.2.4.3 Grass and other vegetation

Add the following:

"Grass sods shall be fine kweek (Cynodon Dactylon) as specified by the Engineer.

The grass sods shall be nursery grown, cut, delivered and laid within 36 hours from harvesting. It shall be free of weeds and disease and contain a minimum soil thickness of at least 30 mm.

The area to be harvested shall be well watered prior to harvesting and handled with extreme care to retain the maximum amount of moisture and soil within the roots. The contractor shall place and plant the sods on the areas indicated by the Engineer. Prior to the placement, the area to receive sods shall be fertilized by applying 40g/m² of super phosphate fertiliser and thereafter be well watered.

Sods shall be fitted closely together and any hollows shall be filled with topsoil to produce an even and smooth surface. During and directly after the laying the sods, the sods shall be well watered and rolled to obtain a level and even surface."

PSD 5.2.5 Transport for Earthworks

Replace the entire contents of Sub-clause 5.2.5 with the following:

"The transport and haul of all materials, as well as material imported from commercial sources or borrow pits selected by the Contractor, irrespective of the distance and source, shall be deemed to be freehaul, the cost of which shall be included in the Contractor's tendered rates and prices for the excavation of the materials.

No separate compensation shall apply for the transportation of excavated materials."

PSD 6 TOLERANCES

PSD 6.1 POSITIONS, DIMENSIONS, LEVELS, ETC.

Add the following:

“PSD 6.1(c) Bulk earthworks

The tolerances applicable to excavations for structural foundations (degree of accuracy II), as specified in Subclause 6.1(a) shall apply, provided no ponding areas or adverse grades result.”

PSD 7 TESTING

PSD 7.2 TAKING AND TESTING OF SAMPLES

Replace the contents of this subclause with the following:

"The Contractor shall arrange with the approved independent laboratory engaged by the Contractor in terms of clause C3.4.9 of the Scope of Works, to carry out sufficient tests on a regular basis as agreed between it and the Engineer to determine whether the degree of compaction, and, where applicable, the quality of materials used, comply with the Specifications and shall submit the results of these tests to the Engineer in a form approved by him.

The compaction requirements for fills shall be deemed complied with when at least 75% of the dry-density tests on any lot show values equal to or above the specified density and when no single value is more than five percentage points below the specified value."

PSD 8 MEASUREMENT AND PAYMENT

PSD 8.3 SCHEDULED ITEMS

PSD 8.3.1 Site Preparation

Replace Clauses 8.3.1.1 and 8.3.1.2 with the following:

"Where Site preparation such as clearing, grubbing, the removal of large trees or the removal and stockpiling of topsoil or surface obstructions are required, the provisions and scheduled items of SABS 1200 C shall apply."

PSD 8.3.2 Bulk Excavation

Replace the contents of subclause 8.3.2 with the following:

“PSD 8.3.2.1 Excavate in all materials and use for embankment fills, platforms, berms, backfill or dispose, as orderedUnit: m³

The unit of measurement shall be the cubic metre measured in place in accordance with Subclause 8.2 of SABS 1200 D.

Separate items will be scheduled for each type of excavation or structure and for each type or manner of disposal of excavated material.

The tendered rates shall cover the cost of excavation in all material, complying with all the precautions required in terms of Subclause 5.1 of SABS 1200 D (as amended) in addition to the cost of excavation, for basic selection and keeping selected material separate, for loading, transporting within the applicable freehaul distance, off-loading at the spoil or stockpile site, maintaining and finishing the spoil site, spreading, backfilling, watering, compacting as specified on the Drawings, final grading, shaping and trimming, for complying with the requirements for tolerances, providing for testing, finishing and tidying, all in accordance with the specifications.

The rate shall further also provide for backfilling any over-excavation or overbreak in accordance with the requirements of PSD 5.2.3.3.”

PSD 8.3.2.2 Extra-over Items PSD 8.3.2.1 for:

- (a) Hard rock excavation Unit : m³
- (b) Boulder excavation, Class A Unit : m³
- (c) Boulder excavation, Class B Unit : m³

The rate shall cover the additional cost of the operations enumerated in Subclauses 8.3.2.1 above for any portion of the excavation that is classified as hard rock, boulder excavation class A or boulder excavation class B as applicable.

NOTE:

The rates tendered for Subclauses 8.3.2.1 and 8.3.2.2 above shall also provide for backfilling any over-excavation or overbreak in accordance with the requirements of PSD 5.2.3.3.”

PSD 8.3.3 Restricted excavation

Replace the heading of subclause 8.3.3 (a) and the contents of the first two paragraphs with the following:

“PSD 8.3.3(a) Excavate for restricted foundations, footings, aprons, beams, landscaping, structures, pathways, bollards, streetlights as well as for walls and drains, in all materials, and use for fill, backfill, berm or dispose, as ordered.....Unit: m³

Separate items will be scheduled for each category of excavation and for each class or manner of disposal of excavated material.

All restricted excavation shall be measured by volume.

Replace “in 5.2.2.1 – 5.2.2.3 (inclusive)” at the end of subclause (a) with “in Clauses 5.2.2.1 to 5.2.2.4 (inclusive).”

Delete Clause 8.3.3(b) (1) as well as any reference to intermediate excavation in subclause (b). For the purposes of measurement and payment, excavation other than hard rock and boulder excavation will not be separately classified (refer PSD 3.1.2).”

PSD 8.3.6 Overhaul

Delete Sub-clause 8.3.6.

No overhaul will be paid on material for the purposes of this Contract and all costs for transporting material shall be included in the applicable tendered rates and amounts.

PSD 8.3.12 Road traffic signs and markings

Delete the contents of this Sub-Clause.

The provisions of PSA 5.10 shall apply.

“PSD 8.3.14* Extra over items 8.3.2.1 and PSD 8.3.3 for temporary stockpiling Unit: m³

The unit of measurement shall be the cubic metre of material from necessary excavations, temporarily stockpiled by the Contractor on the instructions of the Engineer, before being used in embankments, fills or backfill.

Measurements shall be taken in place in compacted embankment, fills or backfill as the case may be.

The tendered rate shall include for the costs, additional to those provided for in PSD 8.3.2.1 and PSD 8.3.3 of off-loading, forming and maintaining the stockpile for as long as is required, reloading and transporting regardless of the distance involved from the stockpile.

Payments to the Contractor under this item will only be made in respect of that material stockpiled on the instructions of the Engineer (which instruction shall state specifically that payments for such stockpiling will be paid for under this item) and no payments will be made to the Contractor under this item in respect of materials stockpiled by the Contractor on its own volition, nor for materials necessarily stockpiled by the Contractor in

consequence of the sequence of operations adopted by it in the course of executing the Works, whether such stockpiling was avoidable or otherwise.”

“PSD 8.3.15*Trees and individual plants complete as detailedUnit: No

Trees / plant installation type stated. (Refer details in schedule)

The rate tendered shall cover all costs to procure, collect, plant/install, construct and execute the following:

- The collection of the trees / plants from the nursery / supplier .
- The excavation of a 1 m³ hole to accommodate the tree and required soil.
- The excavation of the plants bed to accommodate the plant and the required soil.
- Planting of the trees / plants and backfilling the remainder of the hole using a soil mix consisting of 40 % red soil, 50 % black soil and 10% mushroom compost. Each tree shall receive 500 grams super phosphate mixed into above-mentioned soil mix.
- The provision and installation of the tree support and guard as detailed on the drawings.
- The provision and installation of the specified tree grid and frame complete with all incidentals necessary, as detailed on the drawings.
- The tree shall be secured to the tree support with 3 x 500 mm x 30 mm rubber bands.
- The addition of 2 x 100 grams “AGRIFORM” tablets for each tree.
- Directly after planting, each tree shall receive 50 litres of water twice a week.
- Directly after the commencement of the Defects Liability Period, each tree shall be watered and maintained for a period of 6 months.
- Each tree shall receive at least 60 litres of water once a week and all unwanted weeds shall be removed from the soil base around the tree.
- Pruning required: None.

The tendered rate shall include for all fixings shown and detailed on the drawings.

Payment for this item will be as follows :

60% of the rate will be paid once the tree / plants have been delivered and planted to the satisfaction of the Landscaper.

A further 20% will be paid 3 months after initial planting based on the growth and health of the trees and plants as determined by the Landscaper.

The balance will be paid at the release of the retention period (12 months after the certificate of completion has been issued) if the trees and plants have been fully established as determined by the Landscaper.

Note: The Contractor's attention is drawn to Clause C3.4.5.1 under Part 3: Scope of Work.

PSD 8.3.16* Install root barrier geotextile..... Unit : m²

The rates tendered shall cover the cost of supplying and installing a suitable root guard geotextile barrier to protect existing services adjacent to trees planted under PSD 8.1.15.

The geotextile shall comply with the following specifications:

- 17.5% : Active Chemical*: Trifluralin (a,a,a-Trifluoro 2,6 - dinitro - N,N, - Dipropyl - p - toluidine)
- 82.5% : Inert Ingredients: 100% Spunbonded Polypropylene, Polyethylene and Carbon"

PSDA EARTHWORKS (SMALL WORKS)

PSDA 3 MATERIALS

PSDA 3.1 Classification For Excavation Purposes

Delete SABS 1200 D Clause 3.1 and replace with the following:

PSDA 3.1.1 Method of Classifying

The Contractor may use any method he chooses to excavate any class of material but his chosen method of excavation shall not determine the classification of the excavation. The Engineer or his Representative will decide on the classification of materials. In the first instance classification will be based on inspection of the material to be excavated and on the criteria given in PSD 3.1.2(a) and (b).

PSDA 3.1.2 Classes of Excavation

All materials encountered in any excavation for any purpose including restricted excavation will be classified as follows:

(a) Hard rock excavation

Hard rock excavation shall be excavation in material (including undecomposed boulders exceeding 0.17 cubic metres in individual volume) that cannot be efficiently removed without blasting, wedging and splitting, or hydraulic hammers.

This classification includes materials such as:

- solid unfractured rock occurring in bulk
- solid ledges thicker than 200mm
- igneous rock intrusions
- cemented sedimentary rocks.

(b) Soft Excavation

Any material which can be removed by bulldozers or backhoes, shall be classified as soft excavation.

Soft excavation shall be material not falling into the category of hard rock excavation.

PSDA 5 CONSTRUCTION

PSDA 5.1. Precautions

PSDA 5.1.1.2 Safeguarding of excavations

Safeguarding of excavations will be the contractors full responsibility.

PSDA 5.1.1.3 Explosives

No blasting will be allowed

PSDA 5.1.2.4 Negligence

The applicable requirements of subclause 5.4 of SABS 1200A shall apply.

PSDA 5.1.8 Road traffic control

Traffic signs, barriers and flagmen will be required and shall be installed / placed as required. The requirements of subclause PSA 5.11* will also apply.

PSD 5.2.6.2 Overhaul

Delete the contents of this clause. For the purpose of this contract, all haul shall be deemed to be freehaul, and the contractor is to include the cost of haul / transport in the relevant tendered rates.

PSDA 8 MEASUREMENT AND PAYMENT

PSDA 8.3.3 Restricted excavation

Replace the heading of subclause 8.3.3(a) and the contents of the first two paragraphs with the following:

“PSDA 8.3.2(a)Excavate for restricted foundations, footings, trenches, stormwater drains, and landscaping as if in soft material and use for backfill or berm or dispose, as ordered.....Unit : m³

Separate items will be scheduled for each category of excavation and for each class or manner of disposal of excavated material.

All restricted excavation will be measured by volume.

Delete subclause 8.3.3(b)(1) as well as any reference to intermediate excavation in subclause (b). For the purposes of measurement and

payment, excavation other than hard rock excavation (Class A or Class B) will not be separately classified (refer PSD 3.1.2).

“PSDA 8.3.2 (c)* Extra over PSDB 8.3.2(a) for hand excavation where ordered

Unit : m³

The rate tendered shall cover the additional cost, extra over that provided for under 8.3.2(a), for carrying out trench excavation by hand where ordered by the Engineer.

The volume shall be computed from the dimensions specified, shown on the drawings or ordered by the Engineer.”

Note: Normal handwork required to clean and trim the sides and bottoms of mechanically excavated trenches will not qualify for payment in terms of this clause”

“PSDA 8.3.9* Excavate and dispose of unsuitable material from sides or bottom of restricted foundations, footings, trenches and stormwater drains where ordered and replace with:

- (a) Selected material complying with subclause 3.2.2 of SABS 1200 ME compacted to 90% of modified AASHTO maximum density (Source to be stated) Unit : m³
- (c) 15MPa/19 concrete Unit : m³

Separate items will be scheduled for each type of excavation, source of backfill material and manner of backfill.

The rates tendered shall cover the cost of excavating the unsuitable material to the extent ordered by the Engineer, disposing of the material as directed within a free haul distance and subsequent backfilling of the excavation using selected material or concrete as ordered.

NOTE: The work required to construct the selected layer beneath areas to be concrete lined will be measured for payment under (a) as applicable. The unit of measurement shall be the cubic metre of selected material placed and compacted. Any excavation required to accommodate the concrete lining will be deemed to be covered by subclause 8.3.4 of SABS 1200 DM.”

PSGA CONCRETE (SMALL WORKS)

PSGA 1 SCOPE

Add the following:

"This specification shall also cover the construction of the concrete walkways, traffic circles and concrete slabs."

PSGA 3 MATERIALS

PSGA 3.2 CEMENT

PSGA 3.2.1 Applicable Specifications

Replace the contents of this subclause with the following:

"Notwithstanding the contents of this Clause, where reference is made in this specification or the standard specifications to any cement specification, it shall be replaced with the following specification, SABS EN 197-1-Cement-Part 1: Composition, specifications and conformity criteria for common cements.

On this Contract cement grade CEM I 42, 5 shall be used."

PSGA 3.2.2 Storage of cement

Add the following:

"Cement shall not be stored for longer than 12 weeks without the Engineer's permission."

"PSGA 3.8* Curing compound

Curing compound shall be white pigmented natural resin based liquid curing compound complying with ASTM 309-74."

"PSGA 3.9* STAINLESS STEEL

The following grades of stainless steel shall be used:

- 316L for welded applications,
- 316 for not-welded applications."

"PSGA 3.10* MATERIALS FOR BUILDING WORK

PSGA 3.10.1 Cement

The requirements stipulated for subclause 3.2.1 and PSGA 3.2.1 shall apply.

PSGA 3.10.2 Sand

Sand for mortar shall comply with SABS 1090.

PSGA 3.10.3 Bricks

Brickwork shall be built in stretcher bond. The walls shall be built to the dimensions shown on the Drawings or ordered. All bricks shall be well soaked in water immediately before being laid and the previous course of bricks shall be well wetted before the laying of the following course.

Walls shall be carried up regularly so that no brickwork is more than 1m higher than adjoining brickwork.

All bricks shall comply with SABS 227 and shall be NFX burnt clay masonry units free of stones, cracks and other defects. The bricks shall be obtained from an approved manufacturer and samples of the bricks shall be submitted to the Engineer for approval.

PSG 3.10.4 Mortar

Mortar shall comprise of the cement, lime and sand mixed in the proportions given below:

Cement:	50 kg
Lime:	0 – 40L
Sand:	130L (measured loose and damp)"

PSGA 4 PLANT

"PSG 4.4.2 Finish

The finish to all exposed concrete shall be smooth and that to buried or backfilled surfaces, rough.

PSGA 5 CONSTRUCTION

PSGA 5.4 CONCRETE

PSGA 5.4.1.5 Strength Concrete

Add the following:

"The Contractor shall when requesting approval of a mix design, submit the constituent proportions of the proposed mix together with the results of compressive strength tests carried out."

PSGA 5.4.2 Batching

Notwithstanding the requirements of this Clause, the method of batching shall be subject to approval.

PSGA 5.4.7 Curing and protection

Notwithstanding the provisions of this subclause, all cast in situ concrete shall, except where otherwise authorised, be cured in accordance with the requirements of subclause (c) using curing compound of the type specified in PSGA 3.8.

PSGA 5.4.8 Concrete surfaces

All unformed concrete surfaces shall, except where otherwise ordered, be given a wood float finish.

"PSGA 5.5* CONSTRUCTION OF CONCRETE SURFACING

The surfaces on which concrete are to be cast shall, after being trimmed and compacted, be covered with a sprayed bitumen emulsion primer or polyethylene sheeting of nominal thickness 0, 25 mm, all joints in the sheeting being overlapped at least 150mm. Care shall be taken not to damage the bitumen layer or the polyethylene sheeting (as relevant) during the placing of reinforcement and during concreting.

Joints in concrete shall be sealed and shall be constructed as shown on the drawings. The paving shall be cast in alternate panels and, after the concrete in the alternate panels has set, the exposed end surfaces shall be painted with bituminous emulsion before the intermediate slabs are cast.

The exposed surfaces of the concrete shall be given a broom textured finish and shall be cured as specified in 5.4.7 and PSGA 5.4.7."

“PSGA 5.6* BRICKWORK

Brickwork shall be built in stretcher bond, except for the top course of the walls which shall be built in soldier course. The walls shall be built to the dimensions shown on the drawings or ordered. All bricks shall be well soaked in water immediately before being laid and the previous course of bricks shall be well wetted before the laying of the following course.

Walls shall be carried up regularly so that no brickwork is more than 1m higher than adjoining brickwork.

Mortar joints shall not exceed 10 mm in thickness and shall be pointed. The mortar used shall be mixed in small quantities and used within 2 hours of mixing. Bricks shall further be clay fire bricks to SABS 227.”

PSGA 6 TOLERANCES**PSGA 6.4 PERMISSIBLE DEVIATIONS**

Add the following:

“Notwithstanding the tolerances specified for the construction of the embankment, the following tolerances shall apply to the construction of the apron slab:

Position in plan	:	Within 100mm of its designated position, provided that over any length of 30m, the deviation from a straight line joining the extremities of the 30m section, shall not exceed 25mm.
Thickness	:	Not less than 95mm.
Width	:	± 25mm provided the requirements with respect to alignment are met.
Level	:	± 10mm provided the requirement with respect to thickness is met and that the distance between the surface and a 3m straight edge placed on the apron slab is nowhere more than 5mm.

PSGA 7 TESTS**PSGA 7.1.2 Frequency of sampling**

Notwithstanding the requirements of this subclause, the Contractor shall take note that he is responsible for taking an adequate number of tests to ensure that the concrete being used complies with the specification. The Engineer will only carry out such control testing as he may require.

PSGA 8 MEASUREMENT AND PAYMENT

PSGA 8.1.2 Reinforcement

Replace the contents of this clause with the following:

"The unit of measurement for steel bars shall be the ton of reinforcement in place in accordance with the drawings or as authorised by the Engineer.

The unit of measurement for welded steel fabric shall be the square metre of fabric reinforcement in place and the quantity shall be calculated from the nett area covered by the mesh, excluding laps.

Clips, ties, separators, stools and other steel used for positioning reinforcement shall not be measured unless shown on the bending schedules.

The rate tendered shall cover the cost of the supply, delivery, cutting, bending, placing and fixing of the steel reinforcement, including all tying wire, stools, supports and waste."

PSGA 8.1.3 Concrete

Delete all references to "intermediate excavation" throughout this subclause.

Notwithstanding the provisions of subclause 8.1.3.1 (b) and (d) concrete required to replace overbreak or over-excavation will not be measured for payment (refer PSD 3.2.2, PSD 5.1.1.3 and PSD 5.2.2.1).

Add after "testing" in the second line of subclause 8.1.3.3(a) "including transport to an approved laboratory."

PSGA 8.4.4 Unformed surface finishes

Add the following :

"(c) Broom textured finish Unit : m²"

"PSGA 8.4.5*Concrete surfaces (Surface area to be paved, thickness and grade of concrete specified)

..... Unit: m²

The unit of measurement shall be the plan area of concrete surfacing to be placed, irrespective of shape, cross-sectional slope or longitudinal grade.

The rate tendered shall cover the cost of all labour, plant, materials, formwork and incidentals required to construct the surfacing complete as detailed on the drawings, including for the rounding the edges, trimming and compaction of the layer to receive concrete, in the positions and to the extent shown on the drawings, or directed on site, including sprayed

bitumen emulsion primer or polyethylene sheeting, formwork, mesh reinforcement, where applicable, and for texturing. (Expansion joint will be measured elsewhere).

Note :

The testing of the surfacing will be carried out in terms of the applicable requirements of Clause 7 of SABS 1200 MK and PSMK 7 and payment for testing will be effected in terms of PSMK 8.2.3.

The acceptance criteria stated in PSMK 8.2.1 shall also apply to concrete surfacing placed in terms of this specification.

No additional payment will be made for forming voids or boxing out holes.

“PSGA 8.6* Construct raised pedestrian crossing complete (Table Top) ...Unit: m

The unit of measurement shall be the linear meter of crossing constructed measured from one end to the other across the roadway. It should be noted that the average length of crossing is approximately 14 500 mm.

The rate tendered shall cover the cost of all labour, plant, materials, formwork and incidentals required to saw cut the existing bituminous surfacing, to excavate into the existing road surface and layerworks, and to construct the crossing complete as detailed on the drawings, including mortar layer under paving, for trimming and compaction of the layer to receive concrete, in the positions and to the extent shown on the drawings or directed on site, including sprayed bitumen emulsion primer or polyethylene sheeting, formwork, concrete, and for texturing and colouring where applicable as shown. Road signs, road mark painting, kerbing and paving will be measured elsewhere.

PSLC CABLE DUCTS

PSLC 1 SCOPE

Add the following to subclause 1.1:

“This specification shall also cover the supply, laying and bedding in trenches of pipes as ducts for the provision and protection of telecommunication and data cables.”

PSLC 2 INTERPRETATIONS

PSLC 2.1 SUPPORTING SPECIFICATIONS

Add the following to this subclause:

“f) SABS 1200 GA

PSLC 3 MATERIALS

PSLC 3.1 DUCTS

Irrespective of this clause all pipes for cable ducts shall be as follows:

a) Data and telecommunication ducts:

Pipes shall be smooth bore, green, HDPE, Telkom approved ducting pipe, “Kabelflex” or similar approved, complete with push fit couplings and rubber sealing rings.

b) Electrical ducts:

Pipes shall be smooth bore, black, HDPE ducting pipe, “Kabelflex” or similar approved, complete with push fit couplings and rubber sealing rings.

PSLC 3.2 BEDDING

Delete sub-clauses 3.2.1 and 3.2.2 and replace with the following:

“Selected granular material shall be an aggregate, sand or granular material all of a non-cohesive nature, the grading analysis of which shows 100% passing a 13.2 mm sieve and not more than 5% passing a 0.075 mm sieve (Metric sizes). The Compactability Factor shall not exceed 0, 4.”

PSLC 3.3 BACKFILL

Notwithstanding the provisions of this Clause, the material to be used for backfill in areas subject to road traffic loads shall be subbase quality

material complying with the requirements of Clause 3.2.1 of SABS 1200 ME and PSME 3.2.1.

PSLC 3.4 CABLE DUCT MARKERS

Where applicable, temporary markers shall be provided at the end of each duct.

The ends of all ducting pipes shall be temporarily marked with a 300 x 100 x 75 mm clay brick planted 200 mm vertically into the ground directly above the end plugs. The ends of the draw ropes shall be attached to this brick marker. The exposed part of the brick marker shall be painted as follows:

Electricity	Red
Telkom	Green
Communication	Yellow

Permanent markers shall be provided in accordance with the requirements of PSLC 5.10.

PSLC 5 CONSTRUCTION

PSLC 5.1 EXCAVATION OF TRENCHES

Material excavated other than hard rock, will not be separately classified for the purpose of measurement and payment. The unit rate for excavation shall cover excavation in soft and intermediate material.

PSLC 5.1.1 Trench widths and depths

Replace the contents of Clauses 5.1.1.1 and 5.1.1.4 with the following:

“Subject to the requirements of 5.2.4, trenches for ducts shall be excavated to widths determined in accordance with the following minimum requirements:

- Minimum trench width, 450 mm
- Minimum side allowance, 100 mm
- Minimum horizontal spacing between ducts measured at a coupling, 50 mm.”

Replace the contents of Clause 5.1.1.2 with the following:

“Subject to the requirements of 5.2.2.1 and 5.2.4 and unless otherwise shown on the drawings or ordered, trenches shall be excavated to such a depth that, after the duct or nest of ducts has been laid, there is a minimum cover to ground level of at least:

- a) 600 mm for communication and data ducts and

- b) 1 200 mm for electrical ducts.”

PSLC 5.1.3* Excavation for trenches at road crossings

The requirements of PSDB 5.4 shall apply with the additional proviso that the minimum depth of cover over ducts shall be 300mm where construction traffic is liable to cross them. Road crossings shall therefore be constructed after the construction of the roadworks has reached the stage where the required cover is available.

PSLC 5.3.3 Draw wire

Notwithstanding the requirements of this Subclause, the nominal diameter of draw wire shall be 3 mm.

PSLC 5.3.5* Laying to grade

Where two or more Telkom ducts of internal diameter greater than 75 mm are laid together in the same trench, the ducts shall be laid to a minimum grade of 1:400.”

PSLC 5.6 LAYING OF TELECOMMUNICATIONS AND DATA DUCTS WITH OTHER SERVICES

The horizontal separation between telecommunications ducts and other services shall be the maximum possible but in the case of electricity cables at least 300mm. Where the latter cannot be attained the ducts shall be separated from the cables by means of concrete protection slabs (see below) placed vertically.

No service other than telecommunications ducts shall be laid directly above and parallel to a telecommunication duct.

The concrete protection slabs mentioned above shall be 400mm square by 50 mm thick and shall be reinforced with welded mesh Ref. 193. The concrete used shall be 20 MPa/13 and the slabs shall be finished off to the satisfaction of the Engineer.

Replace the heading and contents of Subclause 5.7 with the following:

“PSLC 5.7 CROSSING OF TELECOMMUNICATION DUCTS WITH OTHER SERVICES

Telecommunications ducts should preferably cross above other services. The radial separation at such crossings shall be the maximum possible but in the case of electricity cables at least 300mm. Where the latter cannot be attained, concrete protection slabs as specified in PSLC 5.6 shall be placed above the electricity cable for a distance of 800 mm on either side of the crossing (or below as the case may be).”

PSLC 5.8 ROAD CROSSINGS

Delete the last sentence and replace with:

“The duct(s) shall extend a distance of at least 1m beyond the rear of kerb or walkway as applicable.”

PSLC 5.10 POSITION TO BE MARKED

Replace the contents of this Subclause with the following:

Marking is required on both sides of the carriageway.

“The position of each duct shall be marked by imprinting a letter “I”, “T” and “E”, as applicable, into the wet concrete of extruded kerbs, directly above the duct. The imprint shall be 100 mm high and 10 mm deep and the tool used shall be of an approved shape and design.

Where there is no kerb face, or where pre-cast kerbs are used, the duct shall be marked with a concrete marker comprising a 150mm square by 300mm long, 20 moa/19 concrete block, with the appropriate letter imprinted on the square face. The marker shall be placed hard up against the edge of the road surface or the back of the kerb, level with the verge.”

PSLC 8 MEASUREMENT AND PAYMENT

PSLC 8.1 GENERAL

Add the following:

“Material displaced by the pipeline and by imported material from sources other than trench excavation, shall be disposed of at an approved site furnished by the Contractor. No haulage shall be payable for such material.”

PSLC 8.2.2 Schedule Items

Replace the last line of the first paragraph of Subclause (a) “determined drawing” with “determined in accordance with the provisions of PSLC 5.1.1 and that ordered in terms of PSLC 5.6.”

Delete payment clause 8.2.2(b) and add the following:

“8.2.2(b) Extra over item (a) above for:

Hard rock excavation.....Unit: m³

PSLC 8.2.5 Supply, lay, bed and prove duct

Add after “specified” in paragraph (a) of this clause “as well as the cost of complying with PSLC 5.3.5.”

The tendered rate shall further include all labour, plant, material and incidentals, including push fit couplings, rubber seal rings, end plugs, draw wire, protection during construction and marking of the duct ends.

Replace the heading and contents of Clause 8.2.6 with the following:

PSLC 8.2.6 “Provision of selected granular material complying with PSLC 3.2

(a) From commercial or off-site sources located by ContractorUnit: m³

The rate tendered for shall cover the cost of acquiring, regardless of distance, the required bedding from commercial or off-site sources located by the Contractor, delivering it to points alongside the trench spaced to suit the Contractor’s method of working and disposing of material displaced by each importation within a freehaul distance of 0.5 km.

PSLC 8.2.9 Overhaul of surplus excavation

Delete this subclause.

“PSLC 8.2.10*Imported backfill (source and quality stated)Unit: m³

The provisions of Clause 8.3.3.1 of SABS 1200 DB shall apply, except that the trench width shall be determined in accordance with PSLC 5.1.1 or that called for in terms of 5.6.

“PSLC 8.2.11*Compaction in road reservesUnit: m³

The provisions of PSDB 8.3.3.3 shall apply, except that the trench width shall be determined in accordance with PSLC 5.1.1 or that ordered in terms of PSLC 5.6 and payment will be extra over that covered by 8.2.2(a).”.

“PSLC 8.2.12*Supply and installation of concrete protection slabs Unit: No

The rate tendered shall cover the cost of all labour, plant and material required to manufacture the protection slabs as specified in PSLC 5.6, as well as placing and bedding the slabs.

PART E PROVISION OF THE TEMPORARY WORKFORCE

CONTENTS

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E9	LABOUR RELATIONS AND WORKER GRIEVANCE PROCEDURES
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E11	MEASUREMENT AND PAYMENT

E1. SCOPE

This Specification covers the provisions and requirements relating to the provision of the temporary workforce.

E2. INTERPRETATIONS

E2.1 Supporting Documents

The Tendered Rules, Conditions of Contract, Standard and Construction Specifications, Drawings and statutory minimum requirements relating to the employment and remuneration of labour shall *inter alia* be read in conjunction with this Specification.

E2.2 Definitions and abbreviations

For the purposes of this specification, the definitions given in the Conditions of Contract, the Standard Specifications and the Construction Specifications, together with the following additional definitions shall, unless the context dictates otherwise, apply:

(i) "Key Personnel" means all contracts managers, site agents, materials and survey technicians, trainers, supervisors, foremen, skilled plant operators, artisans and the like, and all other personnel in the permanent employ of the Contractor or Subcontractor who possess special skills and/or who play key roles in the Contractor's or Subcontractor's operation

(ii) "Project Committee" means a committee consisting of the Employer, the Engineer, the Contractor, (or their nominated representatives) as well as representatives of the temporary workforce, which is convened from time to time at

the discretion of the Engineer, for the purposes of acting as an avenue for effective communication and liaison between all the parties referred to, in all matters pertaining to the Contract

(iii) "Subcontractor" means any person or group of persons in association, or firm, or body corporate (whether formally constituted or otherwise) not being the Contractor, to whom specific portions or aspects of the Works are sublet or subcontracted by the Contractor in accordance with the provisions of the Contract

(iv) "Worker" for the purposes of this Specification means any person, not being one of the Contractor's key personnel, nor any key personnel of any Subcontractor, who is engaged by the Contractor, a Subcontractor or the Employer to participate in the execution of any part of the Contract Works and shall include unskilled labour, semi-skilled and skilled labour, clerical workers and the like

(v) "Workforce" means the aggregate body comprising of all workers and shall, unless the context dictates otherwise, include the workforces of the Contractor and all Subcontractors

(vi) "Liaison Officer" means a representative from the temporary workforce, duly elected by them, to act on their behalf and through whom all matters pertaining to the temporary workforce can be channelised.

E2.3 Status

Where any provisions or requirements of this Specification are in conflict with anything elsewhere set out in the Contract, the provisions and requirements of this Specification shall take precedence and prevail.

E3. Permitted Sources Of Temporary Workers

The Contractor shall as far as possible make optimum use of the human resources outside his own workforce and the workforces of all Subcontractors. The temporary workforce which is to be used in the execution of the Works in terms of Part A may consist of the workers of various communities, and shall not be bound to one particular community.

E4. EMPLOYMENT RECORDS TO BE PROVIDED

The Contractor shall maintain accurate and comprehensive records of all workers engaged on the Contract and shall provide the Engineer at monthly intervals from the commencement of the Contract, with interim records substantiating the actual numbers of employment opportunities which have been generated to date and the amounts actually paid in respect thereof. Such interim records shall be in a format approved by the Engineer.

The Contractor shall, on completion of the Contract, and as a pre-requisite event to the release of any retention money in terms of the Conditions of Contract, provide the Engineer with copies of the Terms of Employment as well as independently audited

documentary evidence of the total number of temporary and permanent employment opportunities actually generated during the Contract.

E5. VARIATIONS IN WORKER PRODUCTION RATES

Notwithstanding anything to the contrary as may be stated in or inferred from any other provision of this Contract, the Contractor shall not be entitled to any additional payment or compensation whatever, in respect of any differences as may result between the production rates actually achieved by workers in the course of the execution of the Contract Works and those production rates on which he has based his Tendered.

E6. TRAINING OF THE TEMPORARY WORKFORCE

Selected members of the workforce are to be provided with structured training in accordance with the provisions of Part F.

The Contractor shall make all necessary allowances in his programme of work to accommodate and facilitate the delivery of such structured training and shall comply fully with the requirements of Part F.

The provision of structured training as described in Part F shall not relieve the Contractor of any of his obligations in terms of the Conditions of Contract and the Contractor shall remain fully liable for the provision, at his own cost, of all training of the workforce, additional to that as provided for in Part F, as may be necessary to achieve the execution and completion of the works strictly in accordance with the provisions of the Contract.

E7. RECRUITMENT AND SELECTION PROCEDURES

The Contractor through the Project committee shall be fully responsible for the recruitment and selection of workers to constitute the temporary workforce.

The Contractor shall advise the Engineer in writing of the numbers of each category of temporary worker which he requires, together with the personal attributes which he considers desirable that each category of worker shall possess (taking due cognisance of the provisions of the Contract relating to training).

The Contractor shall, at his own cost, take all necessary actions to advertise within the communities comprising the personnel resources, the fact that temporary employment opportunities exist and the time and place where recruiting will occur. This shall include making contact with the local ward councillors and or labour forums that may exist. Delays in obtaining temporary workers shall not be accepted as reasonable grounds for seeking an extension of time claim.

The Contractor shall record in writing, the details of all persons applying for employment, including *inter alia*:

- (i) Name, address, age and sex
- (ii) Marital status and number of dependants
- (iii) Qualifications and previous work experience (whether substantiated or not)

- (iv) Period since last economically active
- (v) Preference for type of work or task.

The Contractor shall make his selection of workers from amongst the applicants, taking due cognisance of his requirements for the workforce and the provisions of the contract in regard to the provision of training to the workforce and in accordance with the following principles:

- (i) No potential temporary worker shall be precluded from being employed by the Contractor on the execution of the Works, by virtue of his lack of skill in any suitable operation forming part of the Works, unless -
 - all available vacancies have been or can be filled by temporary workers who already possess suitable skills, or
 - The Time for Completion allowed in the Contract, or the remaining portion of the Contract Period (as the case may be) is insufficient to facilitate the creation of the necessary skills.
- (ii) Preference shall be given to the unemployed and single heads of households.
- (iii) The Contractor shall, in so far as is reasonably practicable, give priority to accommodating the applicants' expressed preferences regarding the types of work for which they are selected.

(iv) The selection process shall not be prejudicial to youth (over the age of fifteen years) and women. After making his selection, the Contractor shall advise the Engineer thereof, in writing and the Engineer shall, without undue delay, ratify the Contractor's selection.

The provisions of this clause shall apply *mutatis mutandis* in respect of the selection of additional or replacement members of the workforce as may be necessary from time to time during the Contract.

The Contractor shall, after selecting his temporary workforce, arrange at his own cost for the appointment of the Liaison Officer as representative of the workforce to act on their behalf with regards to all matters pertaining to the workforce.

E8. TERMS AND CONDITIONS PERTAINING TO THE EMPLOYMENT OF THE TEMPORARY WORKFORCE

E8.1 All temporary workers engaged in accordance with the provisions of the Construction Specifications, shall be employed on the terms and conditions of employment as are consistent with those as set out in this Contract. The Contractor shall implement and adhere strictly to such terms and conditions relating to the employment of the temporary workforce, and subject only to the provisions of this Contract, shall not employ any temporary worker on terms and conditions which are less favourable to the worker or inconsistent with the standards and norms generally applicable to temporary workers in the Civil Engineering Industry and applicable to the particular area.

E8.2 The Contractor shall pay to all temporary workers engaged in terms of Part A of the Construction Specifications, not less than the minimum rate of remuneration as specified by the Department of Labour for the free State area.

E9. LABOUR RELATIONS AND WORKER GRIEVANCE PROCEDURES

The Contractor, as the Employer of the workforce, shall be fully responsible for the establishment and maintenance at his own cost, of satisfactory labour relations on site and the resolution of all grievances of temporary workers as may occur.

The Contractor shall at all times adhere to the accepted norms and standards of labour relations prevailing generally in the Civil Engineering Construction Industry and shall conduct himself in a fair and reasonable manner, within the constraints as may be imposed upon him by the terms of the Contract.

In the event of any temporary worker engaged by the Contractor in terms of the Contract, being aggrieved with regard to his terms of employment, working conditions and training, he shall have the right, at his discretion, to be supported in any inquiry or disciplinary hearing or investigation instituted by the Contractor by one member of the temporary workforce and one member of the Project Committee, which persons shall be nominated by the worker.

In the event of any grievance not being satisfactorily resolved through the application of normal dispute resolution procedures, then either the Contractor or the worker concerned may require that the matter be referred to the Project Committee for further consideration, with a view to facilitate the resolution thereof.

E10. THE SUBCONTRACTORS' WORKFORCES

The provisions of this Part F shall apply *mutatis mutandis* to the workforces employed by all Subcontractors engaged by the Contractor and the Contractor shall be fully responsible for ensuring, at his own cost, that the terms of every subcontract agreement entered into are such as to facilitate the application of these provisions in respect of the workforces of all Subcontractors.

The Contractor shall at his own cost and to the extent necessary, assist and **monitor all Subcontractors in the application of the provisions of this Specification, and shall**, in terms of the Conditions of Contract, remain fully liable in respect of the acts, omissions and neglects of all Subcontractors, in respect of the application of the provisions of this Specification.

E11. MEASUREMENT AND PAYMENT

The Contractor will not be separately reimbursed or compensated in respect of the provision of the workforce and creation of temporary employment opportunities and all the Contractor's costs associated with compliance with the provisions of this part of the Construction Specifications shall, except to the extent provided for in Part F as relevant, be deemed to be included in the rates tendered for the various items of work listed in the Bill of Quantities.

PART F: PROVISION OF STRUCTURED TRAINING

CONTENTS

F1	SCOPE
F2	INTERPRETATIONS
F3	ENGINEERING SKILLS TRAINING
F4	ENTREPRENEURIAL SKILLS TRAINING
F5	MEASUREMENT AND PAYMENT

F1. SCOPE

This specification covers the requirements for the provision of the following training:

- (i) Specified structured training to selected members of the workforce and small, medium and micro enterprises (SMME's) by a selected Subcontractor as appointed by the Employer.
- (ii) Additional training deemed necessary by the Contractor, to members of the workforce and small, medium and micro enterprises (SMME's).

F2. INTERPRETATIONS

F2.1 Supporting documents

The Tendered Rules, Conditions of Contract, Standard, Supplementary and Specific Specifications and Construction Specifications and drawings shall *inter alia* be read in conjunction with this specification.

F2.2 Application

The provisions of this specification shall apply in respect of all workers and small, medium and micro enterprises other than the Contractor's key personnel, who are engaged on the execution of the works.

F3. ENGINEERING SKILLS TRAINING

The Contractor shall, from the commencement of the contract, implement a structured training programme comprising of the training delivered by the Selected Subcontractor and any additional training as provided for by the Contractor, in which the various skills required for the execution and completion of the works are imparted to the workers, and where applicable, small, medium and micro enterprises engaged thereon, in a

Programmed and progressive manner. Selected workers shall be trained progressively throughout the duration of the contract in the various stages of a particular type of work.

F3.1 Training programme

The skills training programme to be implemented by the Selected Subcontractor shall comply with the following minimum standards:

- a) Be accredited by the Engineering Industry Training Scheme (CEITS) or other institution recognised by the Department of Labour, as being appropriate for application on this project. Accredited training refers to both the trainers as well as to the training materials.
- b) Be delivered by suitably qualified and experienced trainers accredited to do so.

F3.2 In house training

The Contractor shall provide with his Tendered, full details of any additional accredited and in-house training, viewed to be necessary by the Contractor, which he intends to implement at his own cost. These details shall include the following:

- (i) The name of the accredited training institution and programme
- (ii) The various aspects of each type of training comprised in the programme
- (iii) The manner in which the training is to be delivered
- (iv) The numbers and details of the trainers to be utilized.

Details of such additional skills training shall be attached to Form H of the forms to be completed by the Tenderer.

F3.3 Additional training

The Contractor shall be responsible for the provision of the following necessary for the delivery of the specified and additional skills training programme, including the following:

- (i) Sufficient skilled, competent and accredited trainers to deliver the additional training programme to workers in accordance with the training programme
- (ii) A suitably furnished venue
- (iii) Transport of the workers as required
- (iv) Tools, equipment, and teaching aids
- (v) Stationery and all other necessary materials.

F3.4 Selection of candidates

Members of the workforce will be selected by the Engineer, assisted by the Contractor and the Liaison Officer, to receive specific training as approved by the Engineer.

The following will be taken into account in the selection of the workers to receive the specified training:

- (i) Previous experience (if any)
- (ii) Previous courses completed (if any)
- (iii) Module specific requirements.

F3.5 Duration of training

The Contractor shall allow in his programme for the selected members of the workforce to be engaged in the specified training modules.

Provision must also be made by the Contractor for members of the workforce to receive any additional training as provided for by the Contractor.

F3.6 Training hours

All specified skills-related training shall take place only during normal working hours and the Contractor shall ensure that the selected workers are available at the appropriate times to undergo such training.

F3.7 Approval of training

Both the Selected Subcontractor's and the Contractor's additional training programme shall be subject to the approval of the Engineer, and if so instructed by the Engineer, the Contractor shall alter or amend the programme and course content to suit changing conditions on site and all changes in the Contractor's programme of work.

F3.8 Training record

The Contractor shall keep comprehensive records of the training given to each worker involved in training as well as the nature and number of each task executed by the worker and whenever required shall provide copies of such records to the Engineer.

F3.9 Remuneration during training

Workers shall be remunerated in respect of all time spent undergoing the specified training in terms of Clause D03.02, at the minimum specified wage rate for the area of the Works.

F3.10 Use of workers

The Contractor shall, in so far as it is reasonably feasible, take due cognizance of the nature of the works to be executed at any given time and use trained workers on those aspects of the works for which they have been trained.

F4. ENTREPRENEURIAL SKILLS TRAINING

F4.1 Selection of Candidates

Members from selected small, medium and micro enterprises employed by the Contractor as Subcontractors will be entitled to receive a structured training programme, comprising of training delivered by a Selected Subcontractor and any additional training as provided for by the Contractor, the training will comprise both management skills as well as business development skills.

F4.2 Performance and monitoring

The Contractor shall closely monitor the performance of all the 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 elsewhere in the Contract and where required by the Engineer, and shall make recommendations in this regard. The final list of candidates will be decided between the Contractor, the Engineer and the Project Committee.

F4.3 Delivery of training

The Contractor shall assist in facilitating in the delivery of the training, by instructing and motivating the Subcontractor's regarding attendance and participation therein.

F4.4 Programming of work and training

The Contractor shall further make all reasonable efforts to co-ordinate the programming of the Subcontractor's work with that of the delivery of the structured training.

F4.5 Training standards

The entrepreneurial skills training programme to be implemented by the selected Subcontractor shall comply with the following minimum standards:

(i) Be accredited by the Engineering Industry Training Scheme (CEITS) or other institution recognised by the Department of Labour, as being appropriate for application on this project. Accredited training refers to both the trainers as well as to the training materials.

(ii) Be delivered by suitably qualified and experienced trainers accredited to do so

F4.6 Certificates

Following completion of the structured training, members of small, medium and micro Subcontractors that have demonstrated understanding of and competence in the training material are to be appropriately certified by the accrediting body.

F4.7 In house training and additional training

The Contractor shall provide with his Tendered, full details of any additional accredited and in-house training, viewed to be necessary by the Contractor, which he intends to implement at his own cost. These details shall include the following:

- (i) The name of the training institution and programme
- (ii) The various aspects of each type of training comprised in the programme
- (iii) The manner in which the training is to be delivered
- (iv) The numbers and details of the trainers to be utilized.

Details of such additional entrepreneurial training shall be attached to Form H of the forms to be completed by the Tenderer.

F4.8 Provision of entrepreneurial training

The Contractor shall be responsible for the provision of the following necessary for the delivery of the entrepreneurial training programme, including the following:

- (i) Sufficient skilled and competent trainers to deliver the additional training programme to trainees in accordance with the training programme
- (ii) A suitably furnished venue
- (iii) Transport of the trainees as required
- (iv) Tools, equipment, and teaching aids
- (v) Stationery and all other necessary materials.

F4.9 Training hours

All specified entrepreneurial training shall take place within normal working hours.

F4.10 Approval of training

Both the Selected Subcontractor's and the Contractor's training programme shall be subject to the approval of the Engineer, and if so instructed by the Engineer shall alter or amend the programme and course content.

F4.11 Training records

The Contractor shall keep comprehensive records of the training given to each Subcontractor involved in training and whenever required shall provide copies of such records to the Engineer. At the successful completion of each course each Subcontractor shall be issued with a certificate indicating the course contents as proof of attendance and completion.

F4.12 Remuneration during training

No remuneration in respect of time spent undergoing specified training in terms of this clause will be made to any of the Subcontractors.

F5. MEASUREMENT AND PAYMENT

F5.1 Basic principles

a) General

Measurement and payment for all work executed in terms of this contract shall be measured and paid for in accordance with the principles of the Construction Specifications, irrespective of whether the work is executed as an integral part of the provision of training in terms of this specification.

b) Training

The Contractor shall only be reimbursed for the amounts actually paid by the Contractor to the Selected Subcontractors as appointed by the Employer, in execution of the Engineer's written instruction, plus a percentage as Tendered to cover all his charges and profits.

F5.2 Scheduled items

Payment items are included in the bill of Quantities for the provision of the specified training by selected Subcontractors only.

	Item	Unit
F5.2.1	Conducting of skills audit and the development of a training plan	Provisional
Sum	<p>A provisional sum is allowed for the conducting of a skills audit of the Local Labour, as well as the compilation of a training plan.</p> <p>The provisional sum shall include full compensation for identification of pre-qualification criteria and training needs, staff assessment and evaluation prior to training, all technical research, identification of accredited training courses, and all other actions necessary for commencement of official training sessions in accordance with the specification.</p>	

Any expenditure under this item requires the written prior approval of the Engineer and Employer.

	Item	Unit
F5.2.1	Presenting accredited training course for Local Labour and MEs	Provisional
Sum	<p>The provisional sum shall include full compensation for presenting the courses, including lectures, demonstrations, on-site training and hands-on development, and improvement of maintenance personnel's skills to enable them to maintain and repair installations safely and efficiently at the satisfactory functional condition specified.</p> <p>The provisional sum shall also include full compensation for the Contractor's time, appointment of the accredited trainer for the course, and for all material expenses such as paper hand-outs and slides for the whole group of trainees, the number of which shall be determined during development of the training course.</p>	

Any expenditure under this item requires the written prior approval of the Engineer and Employer.

F5.2.2 Penalty Calculation

Use of Local Labour

Should the contractor fail to meet the minimum requirement of creating 10 employment opportunities on site for the duration of the contract, a penalty of 1,5 * the value of the amount of employment that was not created, calculated at R350-00 per day per person, will be calculated and imposed. This amount will be deducted from the Contractor's payment certificate.

The Contractor is to indicate to the Municipality via a report certified by their auditors indicating the payments made to Local Labour at the end of the Contract before the retention money is released.

MECHANICAL PROJECT
SPECIFICATION & DATA
SHEETS

MPS 01: Distribution Pump Sets (Option 1)

1.	Scope of Works		
1.1	Manufacture, supply, deliver, store, install, commissioning & up-hold for 12 months, as per the specification, the Distribution Pump Sets and pipe work.		
2.	Description of the Equipment		
2.1	Four pump sets are required. The four pump sets receives water from the suction ring pipe work, supplied from the Rand Water Facility, situated next to the Distribution pump station site. Each of the four pumps can pump individually or together in combination, one, two or three pumps operating. The delivery pipe work allows for different delivery options. The distribution pumps can deliver to the reservoirs, the pressure tower and directly into the distribution network. The existing pump sets must be replaced with new pump and pipe work.		
3.	General Information		
3.1	Medium type; Potable Water.	3.2	Medium SG; 1.0
3.3	Medium pH; 5 - 7.	3.4	Medium Temperature; 10 - 25 °C.
3.5	Location; Distribution Pump Station.		
3.6	Reference Drawings;		
4.	Distribution Pump		
		SPECIFIED	OFFERED
4.1	Manufacturer;	-	
4.2	Model;	-	
4.3	Quantity;	4	
4.4	Duty point flow, 1x pump, (L/s);	262.9	
4.5	Duty point head, 1x pump, (m);	43.5	
4.6	Duty point flow, 2x pump parallel , (L/s);	N/A	
4.7	Duty point head, 2x pump parallel , (m);	N/A	
4.8	Pump configuration;	Four duty	
4.9	Pump type;	Axially Split Volute Casing	
4.10	Duty point efficiency (%)	> 95% of BEP	
4.11	Pump min. flow (L/s);	83.33	
4.12	Pump max. flow (L/s);	-	
4.13	Discharge diameter (mm);	-	
4.14	Suction diameter (mm);	-	
4.15	Solids handling size (mm);	N/A	
4.16	Speed at duty point (rpm);	1450	
4.17	Max. speed (rpm);	-	
4.18	Shut-off head (m);	-	
4.19	BEP head (m);	-	
4.20	BEP flow (L/s);	-	
4.21	BEP efficiency (%);	-	
4.22	Self-cleaning wear plate;	N/A	

4.23	Seal type;	Mechanical	
4.24	Bearing seal;	-	
4.25	Oil reservoir;	-	
4.26	Shaft sleeve;	Replaceable	
4.27	NPSH required at the duty point (m);	-	
4.28	NPSH available at the duty point (m);	-	
4.29	Suction lift at the duty point (m);	-	
4.30	Volute casing material;	Ductile iron, ASTM A536, 65-45-12	
4.31	Impeller material;	Ductile iron, ASTM A536, 100-70-03	
4.32	Impeller washer material;	N/A	
4.33	Impeller screw material;	N/A	
4.34	Backplate/Bracket material;	N/A	
4.35	Wear plate material;	N/A	
4.36	Bearing frame material;	Ductile iron, ASTM A536, 65-45-12	
4.37	Shaft material;	17-4 PH SS	
4.38	Shaft sleeve material;	SS 304	
4.39	Fastener material;	Grade 5 Steel	
4.40	Mechanical seal material;	Silicon carbide vs. Silicone carbide	
4.41	Pump & Motor Base-Plate material;	MS, hot dipped galvanized	
4.42	Pump Operating Specification;	ISO 9906 class 2B	

5. Drive Equipment		SPECIFIED	OFFERED
5.1	Motor Manufacturer;	-	
5.2	Motor Model;	-	
5.3	Motor quantity (no.);	4	
5.4	Motor size (kW);	132	
5.5	Motor Rotation Speed (rpm);	1450	
5.6	Motor type;	AC, induction, 3-phase	
5.7	Motor efficiency class (IE);	IE3	
5.8	Motor insulation class;	F	
5.9	Motor ingress rating (IP);	55	
5.10	Motor full load current (Ampere);	-	
5.11	Motor load factor at duty point (%);	80 (min.)	
5.12	Motor power factor at duty point (%);	-	

5.13	Motor thermal protection;	YES	
5.14	Motor heater;	YES	
5.15			

6.	Drive Coupling		
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		SPECIFIED	OFFERED
6.1	Coupling/Drive Manufacturer;	-	
6.2	Coupling/Drive Type;	Tyre Type Flexible	
6.3	V-Belts per pulley (No.);	N/A	
6.4	Drive end pulley diameter (mm);	N/A	
6.5	Drive end pulley shaft diameter (mm);	N/A	
6.6	Non-drive end pulley diameter (mm);	N/A	
6.7	Non-drive end pulley shaft diameter (mm);	N/A	
6.8	Drive end pulley material;	N/A	
6.9	Non-drive end pulley material (mm);	N/A	
6.10	Drive reduction ratio;	N/A	
6.11	V-Belt model, type;	N/A	
6.12	V-Belt length (mm);	N/A	

6.	Drive Coupling (Continue)		
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		SPECIFIED	OFFERED
6.13	Drive max. torque (Nm);	-	
6.14	Drive max. axial load (N);	-	
6.15	Drive max. bending (Nm);	-	

7.	Pipe Work		
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		SPECIFIED	OFFERED
7.1	Suction, from;	Existing Suction Puddle	
7.2	Suction configuration;	Individual per pump	
7.3	Suction Entrance;	Existing Suction Puddle	
7.4	Suction Isolation valve;	Metal Seat Gate PN16 450NB	
7.5	Suction Leg diameter size (mm);	450NB	
7.6	Suction Pipe supports;	Yes, vertical & horizontal	
7.7	Suction Pipe material;	MS, Epoxy	
7.8	Suction Pipe support material;	MS, Hot Dipped Galvanized	
7.8	Delivery to;	Existing Delivery Puddle	
7.10	Delivery configuration;	Individual per pump	

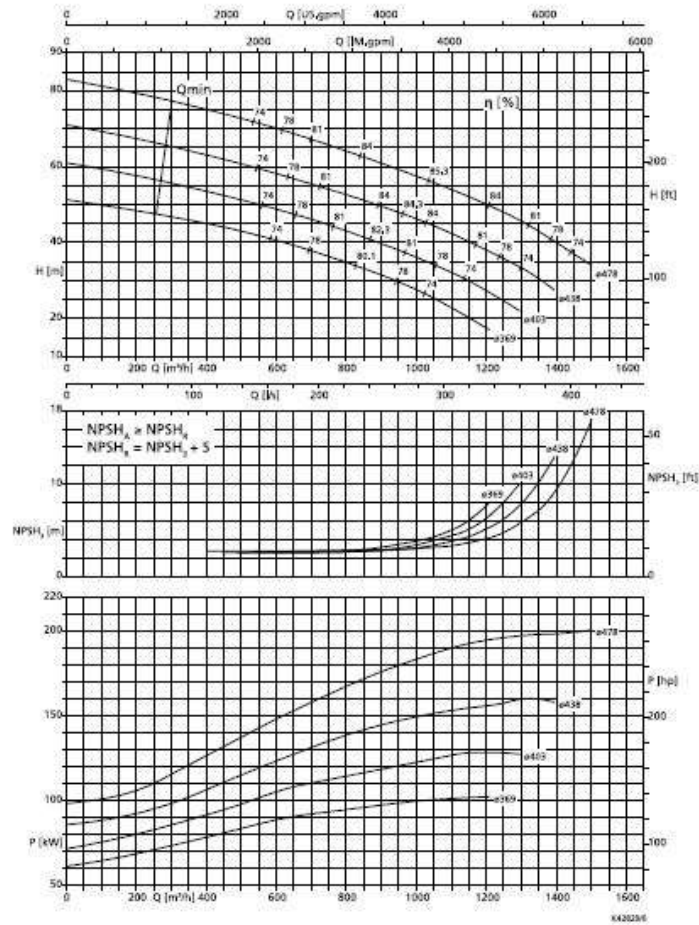
7.11	Delivery Isolation valve;	Metal Seat Gate PN16 250NB	
7.12	Delivery Check valve;	Nozzle Check Multi Stem PN16 250NB	
7.13	Delivery Leg diameter size (mm);	250 to 400NB	
7.14	Delivery Pipe supports;	Yes, horiz. + vert. + elevated	
7.15	Delivery Pipe material;	MS, Epoxy	
7.16	Delivery Pipe supports material;	MS, Hot Dipped Galvanized	
7.17	Pressure gauges;	Yes, suction + delivery, per pump	
7.18	Joint sets;	Yes, bolts/nuts/washers/gaskets	
7.19	Fasteners;	Plain, Hi-Tensile Grade 8.8, Hot Dip Galvanized	
7.20	Anchor bolts;	SS EN 1.4401 Grade	
7.21	Flange Drilling;	SANS 1123 1000/3	
8.	Operation & Control		
8.1	Automatic Operation		
8.1.1	PLC Controlled		
8.2	Manual Operation		
8.2.1	MCC & Field Start/Stop Buttons		
8.3	Instrumentation		
8.3.1	1x Suction Pressure Element & Indicating Transmitter.		
8.3.2	1x Delivery Pressure Element & Indicating Transmitter.		
8.3.3	3x Pump Temperature Element & Indicating Transmitter.		
8.3.4	4x Motor Temperature Element & Indicating Transmitter.		
8.3.5	2x Pump Vibration Element & Indicating Transmitter.		
8.3.6	2x Motor Vibration Element & Indicating Transmitter.		

The following pump curve is corresponding to the specified requirements!



Water Supply
Axially Split Volute Casing Pump

Omega 250-480B, $n = 1450$ rpm



Characteristic curves to ISO 9906/2B, $\rho = 1000$ kg/m³ and $v = \max. 20$ mm²/s
Special design for higher efficiencies on request.

Material variants

Material variant	Max. permissible Impeller diameter D_2 [mm]	NPSH margin S [m]	Power limitation P/n [kW/rpm]	Permissible range of speed n [rpm]
GB / SB	478	0,5	0,4000	$1200 < n \leq 1500$
GC / SC	478	0,5	0,4000	$1200 < n \leq 1500$
DD ₂₅	478	0,5	0,4000	$1200 < n \leq 1500$

MPS_02: Distribution Pump Sets (Option 2)

1. Scope of Works																																																																			
1.1	Manufacture, supply, deliver, store, install, commissioning & up-hold for 12 months, as per the specification, the Distribution Pump Sets and pipe work.																																																																		
2. Description of the Equipment																																																																			
2.1	Four pump sets are required. The four pump sets receives water from the suction ring pipe work, supplied from the Rand Water Facility, situated next to the Distribution pump station site. Each of the four pumps can pump individually or together in combination, one, two or three pumps operating. The delivery pipe work allows for different delivery options. The distribution pumps can deliver to the reservoirs, the pressure tower and directly into the distribution network. The existing pump sets must be replaced with new pump and pipe work.																																																																		
3. General Information																																																																			
3.1	Medium type; Potable Water.																																																																		
3.2	Medium SG; 1.0																																																																		
3.3	Medium pH; 5 - 7.																																																																		
3.4	Medium Temperature; 10 - 25 °C.																																																																		
3.5	Location; Distribution Pump Station.																																																																		
3.6	Reference Drawings;																																																																		
4. Distribution Pump																																																																			
	<table><tr><th></th><th>SPECIFIED</th><th>OFFERED</th></tr><tr><td>4.1</td><td>Manufacturer;</td><td>-</td></tr><tr><td>4.2</td><td>Model;</td><td>-</td></tr><tr><td>4.3</td><td>Quantity;</td><td>4</td></tr><tr><td>4.4</td><td>Duty point flow, 1x pump, (L/s);</td><td>262.9</td></tr><tr><td>4.5</td><td>Duty point head, 1x pump, (m);</td><td>43.5</td></tr><tr><td>4.6</td><td>Duty point flow, 2x pump parallel , (L/s);</td><td>N/A</td></tr><tr><td>4.7</td><td>Duty point head, 2x pump parallel , (m);</td><td>N/A</td></tr><tr><td>4.8</td><td>Pump configuration;</td><td>Four duty</td></tr><tr><td>4.9</td><td>Pump type;</td><td>End Suction, Multi-Vane, Centrifugal</td></tr><tr><td>4.10</td><td>Duty point efficiency (%);</td><td>> 95% of BEP</td></tr><tr><td>4.11</td><td>Pump min. flow (L/s);</td><td>34.7</td></tr><tr><td>4.12</td><td>Pump max. flow (L/s);</td><td>-</td></tr><tr><td>4.13</td><td>Discharge diameter (mm);</td><td>-</td></tr><tr><td>4.14</td><td>Suction diameter (mm);</td><td>-</td></tr><tr><td>4.15</td><td>Solids handling size (mm);</td><td>N/A</td></tr><tr><td>4.16</td><td>Speed at duty point (rpm);</td><td>1450</td></tr><tr><td>4.17</td><td>Max. speed (rpm);</td><td>-</td></tr><tr><td>4.18</td><td>Shut-off head (m);</td><td>-</td></tr><tr><td>4.19</td><td>BEP head (m);</td><td>-</td></tr><tr><td>4.20</td><td>BEP flow (L/s);</td><td>-</td></tr><tr><td>4.21</td><td>BEP efficiency (%);</td><td>-</td></tr></table>		SPECIFIED	OFFERED	4.1	Manufacturer;	-	4.2	Model;	-	4.3	Quantity;	4	4.4	Duty point flow, 1x pump, (L/s);	262.9	4.5	Duty point head, 1x pump, (m);	43.5	4.6	Duty point flow, 2x pump parallel , (L/s);	N/A	4.7	Duty point head, 2x pump parallel , (m);	N/A	4.8	Pump configuration;	Four duty	4.9	Pump type;	End Suction, Multi-Vane, Centrifugal	4.10	Duty point efficiency (%);	> 95% of BEP	4.11	Pump min. flow (L/s);	34.7	4.12	Pump max. flow (L/s);	-	4.13	Discharge diameter (mm);	-	4.14	Suction diameter (mm);	-	4.15	Solids handling size (mm);	N/A	4.16	Speed at duty point (rpm);	1450	4.17	Max. speed (rpm);	-	4.18	Shut-off head (m);	-	4.19	BEP head (m);	-	4.20	BEP flow (L/s);	-	4.21	BEP efficiency (%);	-
	SPECIFIED	OFFERED																																																																	
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4.20	BEP flow (L/s);	-																																																																	
4.21	BEP efficiency (%);	-																																																																	

4.22	Self-cleaning wear plate;	N/A	
4.23	Seal type;	Mechanical	
4.24	Bearing seal;	-	
4.25	Oil reservoir;	-	
4.26	Shaft sleeve;	Replaceable	
4.27	NPSH required at the duty point (m);	-	
4.28	NPSH available at the duty point (m);	-	
4.29	Suction lift at the duty point (m);	-	
4.30	Volute casing material;	Ductile iron, ASTM A536, 65-45-12	
4.31	Impeller material;	Ductile iron, ASTM A536, 100-70-03	
4.32	Impeller washer material;	-	
4.33	Impeller screw material;	-	
4.34	Backplate/Bracket material;	-	
4.35	Wear plate material;	N/A	
4.36	Bearing frame material;	Ductile iron, ASTM A536, 65-45-12	
4.37	Shaft material;	17-4 PH SS	
4.38	Shaft sleeve material;	SS 304	
4.39	Fastener material;	Grade 5 Steel	
4.40	Mechanical seal material;	Silicon carbide vs. Silicone carbide	
4.41	Pump & Motor Base-Plate material;	MS, hot dipped galvanized	
4.42	Pump Operating Specification;	ISO 9906 class 2B	

5. Drive Equipment		SPECIFIED	OFFERED
5.1	Motor Manufacturer;	-	
5.2	Motor Model;	-	
5.3	Motor quantity (no.);	4	
5.4	Motor size (kW);	132	
5.5	Motor Rotation Speed (rpm);	1450	
5.6	Motor type;	AC, induction, 3-phase	
5.7	Motor efficiency class (IE);	IE3	
5.8	Motor insulation class;	F	
5.9	Motor ingress rating (IP);	55	
5.10	Motor full load current (Ampere);	-	
5.11	Motor load factor at duty point (%);	80 (min.)	

5.12	Motor power factor at duty point (%)	-	
5.13	Motor thermal protection;	YES	
5.14	Motor heater;	YES	
5.15			

6. Drive Coupling			
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		SPECIFIED	OFFERED
6.1	Coupling/Drive Manufacturer;	-	
6.2	Coupling/Drive Type;	Tyre Type Flexible	
6.3	V-Belts per pulley (No.);	N/A	
6.4	Drive end pulley diameter (mm);	N/A	
6.5	Drive end pulley shaft diameter (mm);	N/A	
6.6	Non-drive end pulley diameter (mm);	N/A	
6.7	Non-drive end pulley shaft diameter (mm);	N/A	
6.8	Drive end pulley material;	N/A	
6.9	Non-drive end pulley material (mm);	N/A	
6.10	Drive reduction ratio;	N/A	
6.11	V-Belt model, type;	N/A	
6.12	V-Belt length (mm);	N/A	

6. Drive Coupling (Continue)			
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		SPECIFIED	OFFERED
6.13	Drive max. torque (Nm);	-	
6.14	Drive max. axial load (N);	-	
6.15	Drive max. bending (Nm);	-	

7. Pipe Work			
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		SPECIFIED	OFFERED
7.1	Suction, from;	Existing Suction Puddle	
7.2	Suction configuration;	Individual per pump	
7.3	Suction Entrance;	Existing Suction Puddle	
7.4	Suction Isolation valve;	Metal Seat Gate PN16 450NB	
7.5	Suction Leg diameter size (mm);	450NB	
7.6	Suction Pipe supports;	Yes, vertical & horizontal	
7.7	Suction Pipe material;	MS, Epoxy	
7.8	Suction Pipe support material;	MS, Hot Dipped Galvanized	
7.8	Delivery to;	Existing Delivery Puddle	

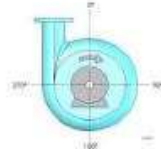
7.10	Delivery configuration;	Individual per pump	
7.11	Delivery Isolation valve;	Metal Seat Gate PN16 250NB	
7.12	Delivery Check valve;	Nozzle Check Multi Stem PN16 250NB	
7.13	Delivery Leg diameter size (mm);	250 to 400NB	
7.14	Delivery Pipe supports;	Yes, horiz. + vert. + elevated	
7.15	Delivery Pipe material;	MS, Epoxy	
7.16	Delivery Pipe supports material;	MS, Hot Dipped Galvanized	
7.17	Pressure gauges;	Yes, suction + delivery, per pump	
7.18	Joint sets;	Yes, bolts/nuts/washers/gaskets	
7.19	Fasteners;	Plain, Hi-Tensile Grade 8.8, Hot Dip Galvanized	
7.20	Anchor bolts;	SS EN 1.4401 Grade	
7.21	Flange Drilling;	SANS 1123 1000/3	
8.	Operation & Control		
8.1	Automatic Operation		
8.1.1	PLC Controlled		
8.2	Manual Operation		
8.2.1	MCC & Field Start/Stop Buttons		
8.3	Instrumentation		
8.3.1	1x Suction Pressure Element & Indicating Transmitter.		
8.3.2	1x Delivery Pressure Element & Indicating Transmitter.		
8.3.3	3x Pump Temperature Element & Indicating Transmitter.		
8.3.4	4x Motor Temperature Element & Indicating Transmitter.		
8.3.5	2x Pump Vibration Element & Indicating Transmitter.		
8.3.6	2x Motor Vibration Element & Indicating Transmitter.		

The following pump curve is corresponding to the specified requirements!

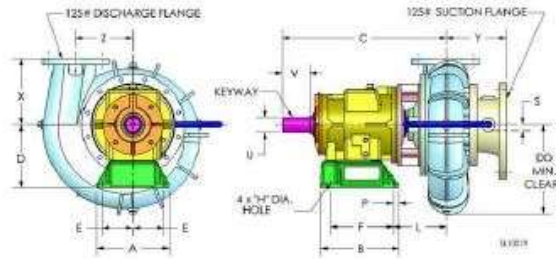


DATA SHEET

10RB-F



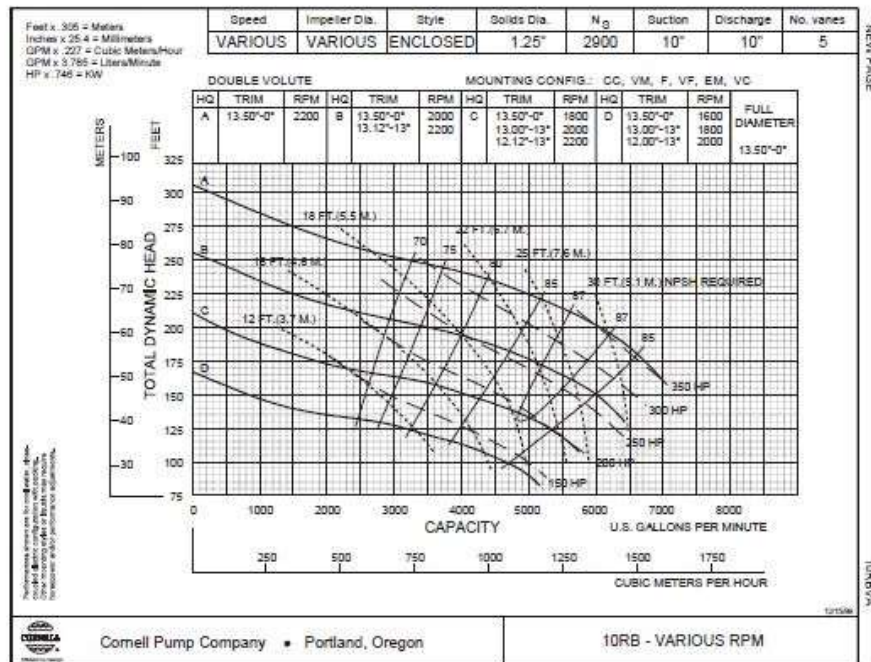
NOTES:
Discharge positions are viewed from the drive end.
Standard increments of discharge position are shown
in the chart below (DISCH INCR). Consult factory for
other discharge positions.



NOTES:

PUMP DIMENSIONS

PUMP DIMENSIONS																				
MODEL	FRAME	CONNECTION		DISCH. INC.	A	B	C	D	DD	E	F	H	L	P	U	V	X	Y	Z	KEYWAY
		DISCH.	SUCT.																	
10RB	F18	10	10	90°	12	12.88	30.7	10.5	19.12	5.12	10.38	0.81	12.34	0.88	2.5	4.5	14	10.55	12	.62X.31



DS85TL-140826 P

MPS_03: Suction Isolation Valve (Actuated).

1. Scope of Works																																																																																		
1.1	Manufacture, supply, deliver, store, install, commissioning & up-hold for 12 months, as per the specification, the suction isolation valve, c/w actuator.																																																																																	
2. Description of the Equipment																																																																																		
2.1	Four (4) actuated, metal seat, gate valves will be required. Each of the four new pump sets and pipe work will require a new actuated suction gate valve.																																																																																	
3. General Information																																																																																		
3.1	Medium type; Potable Water.																																																																																	
3.2	Medium SG; 1.0																																																																																	
3.3	Medium pH; 5 - 7.																																																																																	
3.4	Medium Temperature; 10 - 25 °C.																																																																																	
3.5	Location; Distribution Pump Station.																																																																																	
3.6	Reference Drawings;																																																																																	
4. Metal Seat Gate Valve																																																																																		
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5. Actuator		SPECIFIED	OFFERED
5.1	Motor Manufacturer;	-	
5.2	Motor Model;	-	
5.3	Motor quantity (no.);	4	
5.4	Motor size (kW);	-	
5.5	Motor Rotation Speed (rpm);	-	
5.6	Motor type;	AC, induction, 3-phase	
5.7	Motor efficiency class (IE);	IE3	
5.8	Motor insulation class;	F	
5.9	Motor ingress rating (IP);	55	
5.10	Motor full load current (Ampere);	-	
5.11	Motor load factor at duty point (%);	80 (min.)	
5.12	Motor power factor at duty point (%);	-	
5.13	Motor thermal protection;	Yes	
5.14	Motor heater;	Yes	
5.15	Gearbox Manufacturer;	-	
5.16	Gearbox Model;	-	
5.17	Gearbox quantity (no.);	4	
5.18	Gearbox type;	-	
5.19	Gearbox reduction ratio;	To Valve Specification	
5.20	Gearbox thermal rating (kW);	-	
5.21	Gearbox service factor;	2.25 (min.)	
5.22	Gearbox max. torque (Nm);	To Valve Specification	
5.23	Gearbox max. axial load (N);	-	
5.24	Gearbox max. bending (Nm);	-	
5.25	Gearbox lubrication type;	-	
5.26			
5.27			
6. Operation & Control			
8.1	Automatic Operation		
8.1.1	PLC Controlled		
8.2	Manual Operation		
8.2.1	MCC & Field Start/Stop Buttons		
8.3	Instrumentation		
8.3.1	Open Position Limit Switch & Indication.		
8.3.2	Close Position Limit Switch & Indication.		

8.3.3 4-20 mA feed-back for proportional Open/Close Positioning.

MPS_04: Delivery Isolation Valve (Actuated).

1. Scope of Works																																																																									
1.1	Manufacture, supply, deliver, store, install, commissioning & up-hold for 12 months, as per the specification, the delivery isolation valve, c/w actuator.																																																																								
2. Description of the Equipment																																																																									
2.1	Four (4) actuated, metal seat, gate valves will be required. Each of the four new pump sets and pipe work will require a new actuated suction gate valve.																																																																								
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3.3	Medium pH; 5 - 7.																																																																								
3.4	Medium Temperature; 10 - 25 °C.																																																																								
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4.24	Wiper Ring;	NBR rubber	
4.25	All Fasteners;	Plain, Hi-Tensile Grade 8.8	
4.26	Flange Drilling;	SANS 1123 1000/3	

5.	Actuator	SPECIFIED	OFFERED
5.1	Motor Manufacturer;	-	
5.2	Motor Model;	-	
5.3	Motor quantity (no.);	4	
5.4	Motor size (kW);	-	
5.5	Motor Rotation Speed (rpm);	-	
5.6	Motor type;	AC, induction, 3-phase	
5.7	Motor efficiency class (IE);	IE3	
5.8	Motor insulation class;	F	
5.9	Motor ingress rating (IP);	55	
5.10	Motor full load current (Ampere);	-	
5.11	Motor load factor at duty point (%);	80 (min.)	
5.12	Motor power factor at duty point (%);	-	
5.13	Motor thermal protection;	Yes	
5.14	Motor heater;	Yes	
5.15	Gearbox Manufacturer;	-	
5.16	Gearbox Model;	-	
5.17	Gearbox quantity (no.);	4	
5.18	Gearbox type;	-	
5.19	Gearbox reduction ratio;	To Valve Specification	
5.20	Gearbox thermal rating (kW);	-	
5.21	Gearbox service factor;	2.25 (min.)	
5.22	Gearbox max. torque (Nm);	To Valve Specification	
5.23	Gearbox max. axial load (N);	-	
5.24	Gearbox max. bending (Nm);	-	
5.25	Gearbox lubrication type;	-	
5.26			
5.27			

6.	Operation & Control
8.1	Automatic Operation
8.1.1	PLC Controlled
8.2	Manual Operation
8.2.1	MCC & Field Start/Stop Buttons

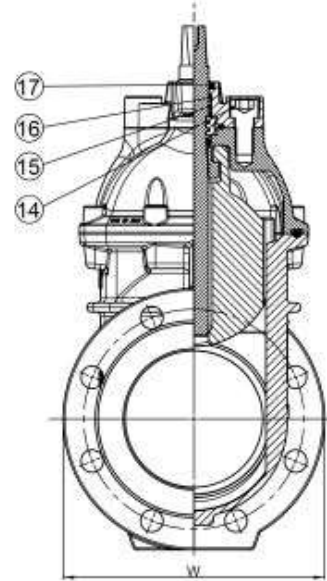
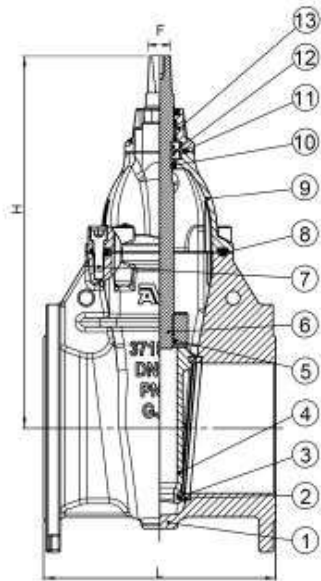
- 8.3 Instrumentation
- 8.3.1 Open Position Limit Switch & Indication.
- 8.3.2 Close Position Limit Switch & Indication.
- 8.3.3 4-20 mA feed-back for proportional Open/Close Positioning.

The following data sheets is corresponding to the specified requirements!

AVK METAL SEAT GATE VALVE, PN16

37/50-004

BS5163 (EN558/3), EN1092, galv. 8.8 bolts, alu-bronze wedge nut


Component list:

1. Body	Ductile iron GJS-500-7 (GGG-50)	10. Stem seal O-ring	EPDM rubber
2. Seat ring	Bronze CC491K (LG2)	11. O-ring	EPDM rubber
3. Face ring	Bronze CC491K (LG2)	12. Thrust collar	Brass, DZR CZ132
4. Wedge	Ductile iron GJS-500-7 (GGG-50)	13. Gland	Ductile iron GJS-500-7 (GGG-50)
5. Wedge nut	Alu-bronze CC331G (AB1)	14. Bolt	Steel, hot dip galvanized
6. Stem	Stainless steel 1.4021 (420)	15. Bushing	Polyamide
7. Bonnet bolt	Steel, hot dip galvanized	16. O-ring	EPDM rubber
8. Bonnet gasket	EPDM rubber	17. Wiper ring	NBR rubber
9. Bonnet	Ductile iron GJS-500-7 (GGG-50)		

Components may be substituted with equivalent or higher class materials without prior notification.

Reference nos. and dimensions:

AVK ref. no.	DN mm	Theoretical weight / kg
37-080-50-010001	80	21
37-100-50-010001	100	27
37-150-50-010001	150	43
37-200-50-010001	200	76
37-250-50-010001	250	106

The designs, materials and specifications shown are subject to change without notice due to the continuous development of our product range.

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MPS_05: Delivery Check Valves.

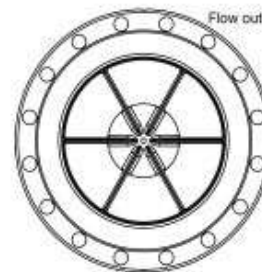
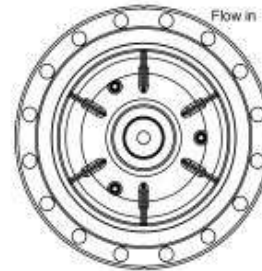
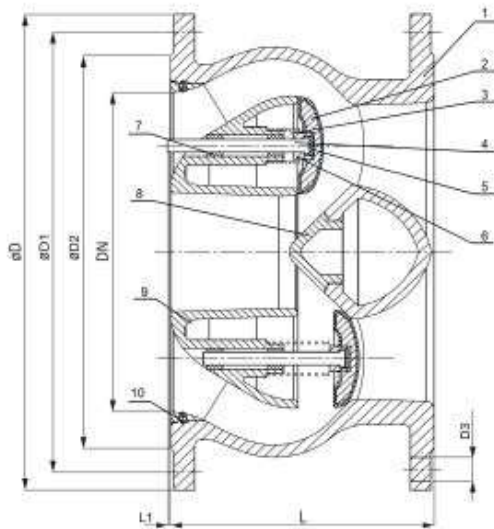
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4.21 Set Screw;	Stainless steel A2																																																
4.22 All Fasteners;	Plain, Hi-Tensile Grade 8.8																																																
4.23 Flange Drilling;	SANS 1123 1000/3																																																

The following data sheets is corresponding to the specified requirements!

AVK NOZZLE CHECK VALVE, MULTI STEM, PN10/16

876/01-001

SS 420 stem, SS 304 spring, alu-bronze bushings, A2 fasteners, FBE coating, EPDM rubber



Component list:

1. Body	Ductile Iron	6. Nut	Stainless steel A2
2. Disc	Ductile iron, EPDM encapsulated	7. Bushing	Alu-bronze C61900
3. Spring	Stainless steel 304	8. Plug	Ductile Iron
4. Stem	Stainless steel 420	9. Diffuser sleeve	Ductile Iron
5. Ring	Polyamide	10. Set screw	Stainless steel A2

Components may be substituted with equivalent or higher class materials without prior notification.

Reference nos. and dimensions:

AVK ref. no.	DN	Flange drilling	D	D1	D2	D3	Number of bolts	L	L1	Theoretical weight/kg
876-0400-01-01102012	400	PN10	585	515	480	28	16	310	-	160
876-0400-01-11102012	400	PN16	580	525	480	31	16	310	-	165
876-0450-01-01102012	450	PN10	615	565	560	28	20	330	7	180
876-0450-01-11102012	450	PN16	640	585	548	31	20	330	7	190
876-0600-01-01102012	500	PN10	670	620	582	28	20	350	-	260
876-0500-01-11102012	500	PN16	715	650	609	34	20	350	-	275
876-0600-01-01102012	600	PN10	780	725	662	31	20	390	15	420
876-0600-01-11102012	600	PN16	840	770	720	37	20	390	15	480

The designs, materials and specifications shown are subject to change without notice due to the continuous development of our product range.

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PS_6: Drainage Pumps & Pipe Work.

1. Scope of Works	
1.1	Manufacture, supply, deliver, store, install, commissioning & up-hold for 12 months, as per the specification, the drainage pumps and pipe work.
2. Description of the Equipment	
2.1	Two (2) drainage pumps (one duty, one stand-by), will form part of this contract. The drainage pumps will be installed inside the drainage sump of the Distribution Pump Station.
3. General Information	
3.1	Medium type; Drainage water.
3.2	Medium SG; 1.0
3.3	Medium pH; 5 - 7.
3.4	Medium Temperature; 10 - 25 °C.
3.5	Location; Distribution Pump Station.
3.6	Reference Drawings;
4. Featuring Equipment	

4.25	Duct-foot;	N/A	
4.26	Volute casing material;	Ductile iron, ASTM A536, 65-45-12	
4.27	Impeller material;	Ductile iron, ASTM A536, 100-70-03	
4.28	Impeller washer material;	SS 416, heat treated	
4.29	Impeller screw material;	SS 304	
4.30	Bearing frame material;	Ductile iron, ASTM A536, 65-45-12	
4.31	Shaft material;	17-4 PH SS	
4.32	Shaft sleeve material;	SS 304	
4.33	Fastener material;	Grade 5 Steel	
4.34	Mechanical seal material;	Silicon carbide vs. Silicone carbide	
4.35	Guide rails + fixing brackets material;	N/A	
4.36	Duct-foot material;	N/A	
4.37			

5. Drive Equipment

		SPECIFIED	OFFERED
5.1	Motor Manufacturer;	-	
5.2	Motor Model;	-	
5.3	Motor quantity (no.);	2	
5.4	Motor size (kW);	-	
5.5	Motor Rotation Speed (rpm);	-	
5.6	Motor type;	AC, induction, 3-phase	
5.7	Motor efficiency class (IE);	IE3	
5.8	Motor insulation class;	H	
5.9	Motor ingress rating (IP);	68	
5.10	Motor full load current (Ampere);	-	
5.11	Motor load factor at duty point (%);	80 (min.)	
5.12	Motor power factor at duty point (%);	-	
5.13	Motor thermal protection;	Yes	
5.14	Motor heater;	-	
5.15			

6. Drive Coupling

		SPECIFIED	OFFERED
6.1	Coupling/Drive Manufacturer;	-	
6.2	Coupling/Drive Model;	-	
6.3	Coupling/Drive Type;	Direct	

6.4	Drive-end shaft diameter (mm);	-	
6.5	Non-drive end shaft diameter (mm);	-	
6.6	Coupling material;	-	
6.7	Drive max. torque (Nm);	-	
6.8	Drive max. axial load (N);	-	
6.9	Drive max. bending (Nm);	-	
6.10			

7.	Pipe Work		
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		SPECIFIED	OFFERED
7.1	Suction, from;	Drainage sump	
7.2	Suction configuration;	Submersible	
7.3	Suction Entrance;	Pump	
7.4	Suction Isolation valve;	-	
7.5	Suction Pipe diameter size (mm);	-	
7.6	Suction Pipe supports;	-	
7.7	Suction strainer;	-	
7.8	Suction Pipe material;	-	
7.9	Suction Pipe support material;	-	
7.10	Delivery to;	To exit at natural ground level.	
7.11	Delivery configuration;	Single, into 2x manifold	
7.12	Delivery Isolation valve;	Yes, RSV Gate Valve	
7.13	Delivery Check valve;	Yes, Ball Check Valve	
7.14	Delivery Pipe diameter (mm);	80NB (Min.)	
7.15	Delivery Pipe supports;	Yes, horiz. + vert. + elevated	
7.16	Delivery Pipe material;	MS, hot dipped galvanized	
7.17	Delivery Pipe supports material;	MS, hot dipped galvanized	
7.18	Pressure gauges;	Yes, delivery, per pump	
7.19	Joint sets;	Yes, bolts/nuts/washers/gaskets	
7.20	Fasteners;	SS EN 1.4401 Grade	

8.	Operation & Control		
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8.1	Manual Operation: by means of Start/Stop push button, independent from protection.
8.2	Automatic Operation: via factory fitted float switch.
8.3	Automatic Operation: Alternate pump after each Start/Stop Cycle.

- 8.4 Automatic Operation: Pre-set Low delivery-pressure pump protection.

PS_7: Ventilation.

1.	Scope of Works		
1.1	Manufacture, supply, deliver, store, install, commissioning & up-hold for 12 months, as per the specification, the ventilation system for the Distribution Pump Station.		
2.	Description of the Equipment		
2.1	The one ventilation system will be designed, supplied and installed to provide fresh outside air into the dry-well, situated below ground level.		
3.	General Information		
3.1	Medium type; Ambient Air.	3.2	Density; 1.29 g/L @ 0°C
3.3	Medium pH; N/A	3.4	Medium Temperature; -5 to 40 °C.
3.5	Location; Distribution Pump Station.		
3.6	Reference Drawings;		
4.	Featuring Equipment		
		SPECIFIED	OFFERED
4.1	Manufacturer;	-	
4.2	Model;	-	
4.3	Quantity;	1x System, c/w fans, ducting, louvres, attenuators, supports etc.	
4.4	Building Ventilation Volume;	744.3 m3	
4.5	Air changes;	6 per hour	
4.6	Air Flow;	4465.8 m3/h	
4.7	Max Air flow velocity (Louvres);	1.0 m/s	
4.8	Fan type;	Duct-mounted, direct drive, axial flow.	
4.9	Fan max. speed;	1500 rpm	
4.10	Acoustic Attenuators;	Yes, Up & Down Stream of Fan	
4.11	Louvre Type;	Acoustic Louvres (Trox Type NL)	
4.12	Fan inlet protection;	Storm type weather louvres	
4.13	Inlet Louvres Direction;	180° away from prevailing wind	
4.14	Ducting Design;	Up & Down Stream, by Contractor	
4.15	Ducting max. flow velocity;	2.0 m/s	
4.16	Ducting material;	Mild Steel, Hot Dip Galvanized	
4.17	Louvre material;	Mild Steel, Hot Dip Galvanized	
4.18	Attenuators	Mild Steel, Hot Dip Galvanized	
4.19	Supports;	Mild Steel, Hot Dip Galvanized	
4.20	Fasteners;	SS EN 1.4401 Grade	
5.	Operation & Control		

- 5.1 Manual Operation: by means of Start/Stop push button, independent from protection.

PS 8: Lifting Equipment.

1.	Scope of Works		
1.1	Manufacture, supply, deliver, store, install, commissioning & up-hold for 12 months, as per the specification, the electrical hoists for the Distribution Pump Station.		
2.	Description of the Equipment		
2.1	There is two electrical hoists required for the two existing lifting beams installed inside the pump[station.		
3.	General Information		
3.1	Medium type; N/A	3.2	Density; N/A
3.3	Medium pH; N/A	3.4	Medium Temperature; N/A
3.5	Location; Distribution Pump Station.		
3.6	Reference Drawings;		
4.	Featuring Equipment		
		SPECIFIED	OFFERED
4.1	Manufacturer;	-	
4.2	Model;	-	
4.3	Quantity;	2	
4.4	Safe Working Load;	5 Ton	
4.5	Hoist type;	Chain	
4.6	Horizontal travel;	Manual, trolley	
4.7	Vertical lift;	Electrical	
4.8	Control;	Field control panel	
4.9	Vertical lift height;	6.0 m	
4.10	Over-Load Protection;	Yes, with alarm	
4.11	Motor size (kW);	-	
4.12	Motor Rotation Speed (rpm);	-	
4.13	Motor type;	400VAC, 50Hz,induction, 3-phase	
4.14	Motor efficiency class (IE);	IE3	
4.15	Motor insulation class:	H	
4.16	Motor ingress rating (IP);	68	
4.17	Motor full load current (Ampere);	-	
5.	Operation & Control		

- 5.1 Manual Operation: by means of Start/Stop push button, independent from protection.

PS_9: Inflow Meter.

1.	Scope of Works		
1.1	Manufacture, supply, deliver, store, install, commissioning & up-hold for 12 months, as per the specification, the electromagnetic flow meter for the inflow from the Rand Water supply.		
2.	Description of the Equipment		
2.1	There is one electromagnetic flow meter required for the project. The supplied flow meter must be installed where the existing flow meter is installed, on the inflow Rand Water pipeline. The existing flow meter is installed inline, on a 1050mm Ø pipeline. The contractor must supply and install the specified flow meter.		
3.	General Information		
3.1	Medium type; Potable Water.	3.2	Medium SG; 1.0
3.3	Medium pH; 5 - 7.	3.4	Medium Temperature; 10 - 25 °C.
3.5	Location; Distribution Pump Station.		
3.6	Reference Drawings;		
4.	Featuring Equipment		
		SPECIFIED	OFFERED
4.1	Manufacturer;	-	
4.2	Model;	-	
4.3	Quantity;	1	
4.4	Instrument accuracy;	± 0.2%	
4.5	Instrument type;	Electromagnetic flow meter	
4.6	Pressure Rating;	PN16, ASME CI 300	
4.7	Communication;	4-20mA, HART, Modus, FF, Profibus-PA/DP, PROFINET	
4.8	Flow measurement;	Bi-directional	
4.9	Turn-down ration;	up to 1000:1	
4.10	Liner;	PP or Hard Rubber, chemical resistant	
4.11	Ingress Rating;	IP68	
4.12	Max.expected flow rate;	2638.3 m3/h	
4.13	Max.expected flow velocity;	0.8 m/s	
4.14	Existing pipeline size;	1050 mm Ø	
5.	Operation & Control		
5.1	Automatic Operation		
5.1.1	Controller is MCC Panel Mounted, 4-20 mA signal to PLC .		

The following data sheets is corresponding to the specified requirements!

OPTIFLUX 2300 | KROHNE SOUTH AFRICA

<https://za.krohne.com/en/products/flow-measurement/flowmeters/eie...>

KROHNE South Africa > Products > Flow measurement > Flowmeters > Electromagnetic flowmeters

OPTIFLUX 2300

Electromagnetic flowmeter for advanced water and wastewater applications

- High accuracy ($\pm 0.2\%$), with CT approvals (OIML R49, MID MI-001)
- DD/DD installation acc. to MID MI-001 and OIML R49 accuracy class 1
- Flange: DN25...3000 / 1...120", max. PN40 / ASME CI 300
- 3 x 4...20 mA, HART[®], Modbus, FF, Profibus-PA/DP, PROFINET



OPTIFLUX 2300 C – Compact version

[Overview](#)

[Accessories](#)

[Applications](#)

[Links](#)



The OPTIFLUX 2300 is an electromagnetic flowmeter (EMF) for all demanding applications with water and wastewater. The high-end meter is particularly suitable for applications requiring high accuracy and extensive diagnostics. The EMF has the widest diameter range available in the market (DN25...3000 / 1...120") and complies with requirements for custody transfer (MID MI-001, OIML R49). The flowmeter allows for custody transfer (CT) measurement without inlet/outlet runs (DD/DD) according to OIML R49 accuracy class 1. It has a wide range of approvals for potable water. This makes the OPTIFLUX 2300 an effective alternative to mechanical water meters, not least in CT measurement of potable water.

[Show more](#)

Product highlights

- Bi-directional flow measurement over a wide dynamic range (turn down ratio: up to 1000:1)
- No inlet/outlet runs needed for OIML R49 class 1 accuracy
- Widest diameter range available in the market
- Available with patented reference electrode: cost-saving installation without grounding rings
- PP or hard rubber liner: excellent chemical resistance
- Optional for burial installation and constant flooding (IP68)
- Largest custody transfer approved diameter range
- Tamper proof
- Standard measurement accuracy: $\pm 0.2\%$ or $\pm 1\text{mm/s}$ of measured value (MV)
- Extensive sensor and process diagnostics (incl. NE 107)
- Meets potable water standards: ACD, DVGW, NSF, TZW, KTW, WRAS, KIWA, etc.
- On-site verification of flowmeter with

Typical applications

General

- All advanced water and wastewater applications
- Custody transfer measurement

Water and wastewater industry

- Fiscal metering (custody transfer) of potable water
- Abstraction and irrigation
- Monitoring of distribution networks
- Water treatment plants (raw water, drinking water, treatment chemicals)
- Wastewater networks
- Combined and separate sewage systems
- Storm water overflows (SWOs)
- Municipal wastewater treatment plants
- Desalination plants (sea water, permeate, brine)

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C3.5 MANAGEMENT

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C3.5.1 HEALTH AND SAFETY SPECIFICATIONS

This part of C3.5 Management contains specifications for Health and Safety matters not covered by C3.4 Construction Specifications.

The number of each clause and each payment item in this specification is prefixed with a G to differentiate these clauses and items.

SECTION G1000 : HEALTH AND SAFETY REQUIREMENTS

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G1001 SCOPE

This health and safety specification establishes the overarching framework within which a contractor is required to satisfy general requirements for occupation health and safety in an engineering and construction works contract.

- Note:** 1) This specification establishes general requirements to enable the employer and the contractor to satisfy the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the Construction Regulations, 2003.
- 2) The Construction Regulations, 2003, require an employer to stop any contractor from executing construction work which is not in accordance with the contractor's health and safety plan for the site or which poses a threat to the health and safety of persons.

G1002 DEFINITIONS

Act: the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)

competent person: any person having the knowledge, training and experience specific to the work or task being performed

ergonomics: the application of scientific information concerning humans to the design of objects, systems and the environment for human use in order to optimize human well-being and overall system performance hazard: a source

of or exposure to danger incident: an event or occurrence occurring at work or arising out of or in connection with the activities of persons at work, or in connection with the use of plant or machinery, in which, or in consequence of which-

- a) any person dies, becomes unconscious, suffers the loss of a limb or part of a limb or is otherwise injured or becomes ill to such a degree that he is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or to continue with the activity for which he was employed or is usually employed;
- b) a major incident occurred; or
- c) the health or safety of any person was endangered and where-
 - i) a dangerous substance was spilled;
 - ii) the uncontrolled release of any substance under pressure took place;
 - iii) machinery or any part thereof fractured or failed resulting in flying, falling or uncontrolled moving objects; or machinery ran out of control

health and safety plan: a documented plan which addresses hazards identified and includes safe work procedures to mitigate, reduce or control the hazards identified.

health and safety specification: a documented specification of all health and safety requirements pertaining to the associated works on a construction site, so as to ensure the health and safety of persons

inspector: a person designated as such under section 28 of the Act

major incident: an occurrence of catastrophic proportions, resulting from the use of plant or machinery, or from activities at a workplace

reasonably practicable: practicable having regard to:

- a) the severity and scope of the hazard or risk concerned;
- b) the state of knowledge reasonably available concerning that hazard or risk and of any means of removing or mitigating that hazard or risk;
- c) the availability and suitability of means to remove or mitigate that hazard or risk; and
- d) the cost of removing or mitigating that hazard or risk in relation to the benefits deriving therefrom;

risk: the probability that injury or damage will occur

safe: free from any hazard

scaffold: any temporary elevated platform and supporting structure used for providing access to and supporting workmen or materials or both

specification data: data, provisions and variations that make this specification applicable to a particular contract

structure

- a) any building, steel or reinforced concrete structure (not being a building), railway line or siding, bridge, waterworks, reservoir, pipe or pipeline, cable, sewer, sewage works, fixed vessels, road, drainage works, earthworks, dam, wall, mast, tower, tower crane, batching plants, pylon, surface and underground tanks, earth retaining structure or any structure designed to preserve or alter any natural feature, and any other similar structure;
- b) any formwork, false work, scaffold or other structure designed or used to provide support or means of access during construction work; or
- c) any fixed plant in respect of work which includes the installation, commissioning, decommissioning or dismantling and where any such work involves a risk of a person falling two metres or more

substance: any solid, liquid, vapour, gas or aerosol, or combination thereof

suitable: capable of fulfilling or having fulfilled the intended function or fit for its intended purpose

G1003 INTERPRETATION

- G3.1 The Act and its associated regulations shall have precedence in the interpretation of any ambiguity or inconsistency between it and this specification.
- G3.2 Compliance with the requirements of this specification does not necessarily result in compliance with the provisions of the Act.

G1004 REQUIREMENTS

G4.1 General requirement

- G4.1.1 The contractor shall execute the works in a manner that complies with all the requirements of the Act and all its associated regulations, and in so doing, minimize the risk of incidents occurring.
- G4.1.2 The contractor shall with respect to the site and the engineering and construction works that are contemplated:

- a) identify the hazards and evaluate the risks associated with such work constituting a hazard to the health and safety of such employees and the steps that need to be taken to comply with the Act; and
- b) as far as is reasonably practicable, prevent the exposure of such employees to the hazards concerned or, where prevention is not reasonably practicable, minimize such exposure.

G4.1.3 The contractor shall as far as is reasonably practicable, cause every employee to be made conversant with the hazards to his health and safety attached to any work which he has to perform, any article or substance which he has to produce, process, use, handle, store or transport and any plant or machinery which he is required or permitted to use, as well as with the precautionary measures which should be taken and observed with the respect to those hazards.

G4.1.4 The contractor shall ensure that all employees under his or her control are:

- a) informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the risk assessment; and
- b) issued with proof of health and safety induction training issued by a competent person and carry proof of such induction when working on site.

G4.1.5 The contractor shall not allow or permit any employee to enter any site, unless such person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

G4.1.6 The contractor shall ensure that each visitor to a construction site, save where such visitor only visits the site office and is not in direct contact with the construction work activities:

- a) undergoes health and safety instruction pertaining to the hazards prevalent on the site; and
- b) is provided with the necessary personal protective equipment.

G4.1.7 The contractor shall provide suitable on-site signage to alert workers and visitors to health and safety requirements.

G4.1.8 The contractor shall not permit any person who is or who appears to be under the influence of intoxicating liquor or drugs, to enter or remain at a workplace.

G4.2 Health and safety representatives

G4.2.1 The contractor shall appoint in writing one health and safety representative for every 50 employees of the contractor working on the site, whenever there are more than 20 employees on the site; to:

- a) review the effectiveness of health and safety measures;
- b) identify potential hazards and potential major incidents;
- c) in collaboration with his employer, examine the causes of incidents;
- d) investigate complaints by any employee of the contractor relating to that employee's health or safety on the site;
- e) make representations to the contractor on matters arising from a), b), c) or d) or on general matters affecting the health or safety of the employees at the workplace;
- g) inspect the site with a view to the health and safety of employees, at regular intervals;
- h) participate in consultations with inspectors at the workplace and accompany inspectors on inspections of the workplace; and
- i) participate in any internal health or safety audit.

G4.2.2 The contractor shall inform the relevant safety representative:

- a) beforehand of inspections, investigations or formal inquiries of which he has been notified by an inspector; and
- b) as soon as reasonably practicable of the occurrence of an incident on the site.

G4.2.3 The contractor shall convene health and safety meetings whenever more than two health and safety representatives have been appointed for the site. These meetings shall be attended by all health and safety representatives and shall be convened at least once every month to:

- a) make recommendations to the employer regarding any matter affecting the health or safety of persons on the site; and

- b) discuss any incident on the site in which or in consequence of which any person was injured, became ill or died.

G4.2.4 The contractor shall consult with the health and safety committee on the development, monitoring and review of the risk assessment.

G4.3 Appointment of construction supervisor and safety officers

4.3.1 The contractor shall appoint a full-time competent employee designated in writing as the construction supervisor for the site, with the duty of supervising the performance of the work falling within the scope of the contract and may appoint one or more competent employees to assist the appointed construction supervisor.

1.3.2 A contractor may having considered the size of the project, the degree of dangers likely to be encountered or the accumulation of hazards or risks on the site, appoint a full-time or part-time construction safety officer in writing, who has in the contractor's opinion the necessary competencies and resources, to assist the contractor in the control of all safety related aspects on the site.

1.3.3 The contractor shall ensure that the construction supervisor is in possession of the most recently updated version of the fall protection plan.

G4.3.4 The contractor shall ensure that the following activities, as relevant, are carried out under the supervision of a competent person and that such persons are appointed in writing:

- a) all formwork and support work operations;
- b) excavation work;
- c) demolition work;
- d) scaffolding work operations;
- e) suspended platform work operations;
- f) operation of batch plants; and
- g) the stacking and storage of articles on the site.

G4.4 Risk assessment

G4.4.1 The contractor performing work falling within the contract shall, before the commencement of any such work and during construction work, cause a risk assessment to be performed by a competent person appointed in writing. Such an assessment shall as a minimum:

- to;
- a) identify the risks and hazards to which persons may be exposed
 - b) analyse and evaluate the identified risks and hazards;
 - c) document a plan of safe work procedures to mitigate, reduce or control the risks and hazards that have been identified;
 - d) provide a monitoring plan; and
 - e) provide a review plan.

Note: A risk assessment is an important step in protecting workers as well as complying with the law. It helps you focus on the risks that really matter in a particular workplace – the ones with the potential to cause real harm. Workers and others have a right to be protected from harm caused by a failure to take reasonable control measures. The following four steps are recommended:

Identify the hazards by looking at what could reasonably be expected to cause harm, ask employees or their representatives what they think, obtain advice from trade associations or publications on health and safety, check manufacturer's instructions or data sheets for chemicals and equipment as they can be very helpful in spelling out the hazards and putting them in their true perspective, review accident and ill-health records, think about long-term hazards to health (eg high levels of noise or exposure to harmful substances) as well as safety hazards etc.

Identify who may be harmed and how by identifying how groups of people might be harmed i.e. what type of injury or ill health might occur.

Evaluate the risks and decide on precautions by doing everything 'reasonably practicable' to protect people from harm i.e. by looking at how things are done, what controls are in place and how the work is organised and comparing this against good practice to see if more can be done to bring practices up to standard. Consider if the hazard can be got rid of all together, and if not how can the risks be controlled so that harm is unlikely, e.g. try a less risky option (eg switch to using a less hazardous chemical); prevent

access to the hazard (eg by guarding); organise work to reduce exposure to the hazard (eg put barriers between pedestrians and traffic); issue personal protective equipment (eg clothing, footwear, goggles etc); and provide welfare facilities (eg first aid and washing facilities for removal of contamination).

Record the findings by writing down the findings of the risk assessment.

G4.4.2 The contractor shall ensure that as far as is reasonably practicable, ergonomic related hazards are analysed, evaluated and addressed in the risk assessment.

G4.4.3 The contractor shall require a competent person to prepare a fall protection plan in compliance with the requirements of the Construction Regulations.

G4.4.4 Notwithstanding the provisions of the fall protection plan, the contractor shall ensure that:

- a) all unprotected openings in floors, edges, slabs, hatchways and stairways are adequately guarded, fenced or barricaded or that similar means are used to safeguard any person from falling through such openings;
- b) no person works in an elevated position, unless such work is performed safely as if working from a scaffold or ladder;
- c) notices are conspicuously placed at all openings where the possibility exists that a person might fall through such openings;
- d) fall prevention and fall arrest equipment is:
 - i) suitable and of sufficient strength for the purpose or purposes for which it is being used having regard to the work being carried out and the load, including any person, it is intended to bear; and
 - ii) securely attached to a structure or plant and the means of attachment thereto is suitable and of sufficient strength and stability for the purpose of safely supporting the equipment and any person who is liable to fall;
fall arrest equipment is only used where it is not reasonably practicable to use fall prevention equipment; and
- f) suitable and sufficient steps are taken to ensure, as far as is reasonably practicable, that in the event of a fall by any person, the fall arrest equipment or the surrounding environment does not cause injury to the person.

G4.4.5 Where roof work is being performed on a construction site, the contractor shall ensure that it is indicated in the fall protection plan that:

the roof work has been properly planned;

the roof erectors are competent to carry out the work;

no employees are permitted to work on roofs during inclement weather conditions or if weather conditions are a hazard to the health and safety of the employees;

prominent warning notices are to be placed where all covers to openings are not of sufficient strength to withstand any imposed loads and where fragile material exists;

the areas mentioned in paragraph (d) are to be barricaded off to prevent persons from entering; suitable and sufficient platforms, coverings or other similar means of support have been provided to be used in such a way that the weight of any person passing across or working on or from fragile material is supported; and there is suitable and sufficient guard-rails or barriers and toe-boards or other similar means of protection to prevent, so far as is reasonably practicable, the fall of any person, material or equipment.

G4.4.6 The contractor shall ensure that:

- a) all reasonably practicable steps are taken to prevent the uncontrolled collapse of any new or existing structure or any part thereof, which may become unstable or is in a temporary state of weakness or instability due to the carrying out of construction work;
- b) no structure or part of a structure is loaded in a manner which would render it unsafe; and
- c) specification data prepared by the designer of the structure is taken into account in the risk assessment;

Note: The specification data provided by the designer should outline known or anticipated dangers or hazards relating to the works and make available all information required for the safe execution of the work. It should provide as relevant, geotechnical information (or make reference to reports provided in the site information), the loading the structure is designed to withstand, the methods and sequence of construction.

G4.5 Health and safety plans

G4.5.1 The contractor shall prior to commencing the works to which this specification applies, submit to the employer for approval a

suitable and sufficiently documented health and safety plan, based on this specification and the risk assessment that is conducted.

G4.5.2 The health and safety plan shall as a minimum provide:

- a) the information contained in Table 1 in respect of each of the hazards associated with work falling within the scope of the contract (see Figure 1); and

Table 1: Example of the format of a health and safety plan

What are the hazards?	Who might be harmed and how?	What are the safe work procedures for the site?	What further action is necessary (monitoring and review)?	Action by whom	Action by when

- b) an outline of the manner in which the contractor intends complying with the requirements of this specification.

G4.5.3 The contractor shall discuss the submitted health and safety plan with the employer's representative, modify such plan in the light of the discussions and resubmit the modified plan for approval.

G4.5.4 The contractor shall apply the approved health and safety plan from the date of commencement of and for the duration of the works to which this specification applies.

G4.5.5 The contractor shall conduct periodic audits for compliance with the approved health and safety plan at intervals agreed upon with the employer, but at least once every month.

G4.5.6 The contractor shall update the health and safety plan whenever changes to the works are brought about.

G4.6 Subcontractors

G4.6.1 The contractor may only subcontract work in terms of a written subcontract and shall only appoint a subcontractor should he be reasonably satisfied that such a subcontractor has the necessary competencies and resources to perform the work falling within the scope of the contract safely. Such a subcontract shall require that the subcontractor shall:

- a) co-operate with the contractor as far as is necessary to enable both the contractor and sub-contractor to comply with the provisions of the Act; and

- b) as far as is reasonably practicable, promptly provide the contractor with any information which might affect the health and safety of any person at work carrying out work or any person who might be affected by the work of such a person at work or which might justify a review of the health and safety plan.

G4.6.2 The contractor shall provide any sub-contractor who is submitting a tender or appointed to perform a sub-contract falling within the scope of the contract, with the relevant sections of this specification and associated specification data which might be pertinent to the sub-contract.

G4.6.3 The contractor shall take reasonable steps as are necessary to ensure:

- a) co-operation between all sub-contractors to enable each of those sub-contractors to comply with the requirements of the Act and associated regulations; and
- b) that each sub-contractor's health and safety plan is implemented.

G4.6.4 The contractor shall conduct periodic audits for compliance with the approved health and safety plan of each and every sub-contractor working on the site at intervals agreed upon with such contractors, but at least once per month.

G4.6.5 The contractor shall stop any contractor from executing construction work which is not in accordance with the contractor's or subcontractor's health and safety plan for the site or which poses a threat to the health and safety of persons.

G4.6.6 The contractor shall ensure that where changes to the works occur, sufficient health and safety information and appropriate resources are made available to the subcontractor to execute the work safely.

G4.6.7 The contractor shall ensure that:

- a) every subcontractor is registered and in good standing with the compensation fund or with a licensed compensation insurer prior to work commencing on site;
- b) potential subcontractors submitting tenders have made provision for the cost of health and safety measures during the construction process; and

- c) every subcontractor has in place a documented health and safety plan prior to commencing any work on site which falls within the scope of the contract.

G4.6.8 The contractor shall receive, discuss and approve health and safety plans submitted by subcontractors.

G4.6.9 The contractor shall ensure that all subcontractors are informed regarding any hazard as stipulated in the risk assessment before any work commences, and thereafter at such times as may be determined in the risk assessment.

G4.6.10 The contractor shall reasonably satisfy himself that all employees of subcontractors are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the risk assessment.

The contractor shall satisfy himself and ensure that all subcontractor employees deployed in the site are:

- a) informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the risk assessment; and
- b) issued with proof of health and safety induction training issued by a competent person and carry proof such induction when working on site.

G4.7 Reporting of incidents

The contractor shall notify the employer's representative of any incident as soon as possible after it has occurred and report such incidence to an inspector.

G4.8 Administration

G4.8.1 Notification of intention to commence construction work

The contractor shall notify the Provincial Director of Labour in writing using a form similar to that contained in Annexure A of the Construction Regulations issued in terms of the Act before construction work commences and retain a copy of such notification in the health and safety file where such work:

involves the demolition of a structure exceeding a height of 3m;

involves the use of explosives to perform construction work;

involves the dismantling of fixed plant at a height greater than 3m;

exceeds 30 days or will involve more than 300 person days of construction work; and includes:

- i) excavation work deeper than 1m; or
- ii) working at a height greater than 3 m above ground or a landing.

G4.8.2 Health and safety file

G4.8.2.1 The contractor shall maintain on site a health and safety file on site which contains copies of the following, as relevant:

- a) the notification made to the Provincial Director of Labour in terms of 4.4.1;
- b) the letters of appointment of health and safety representatives;
- c) the minutes of all health and safety meetings;
- d) a comprehensive and updated list of all the subcontractors (nominated, selected or domestic) employed on site by the contractor, indicating the type of work being performed by such sub-contractors;
- e) a copy of each and every subcontract agreement;
- f) the contractor's health and safety plan;
- g) the health and safety plans of all the contractor's subcontractors who are required to provide such plans;
- h) the recommendations made to the contractor by the health and safety committee referred to in 4.2.3
- i) any report made to an inspector by the health and safety committee referred to in 4.2.3; and
- j) the findings of all audit reports made regarding the implementation of the contractor's or a subcontractor's health and safety plan;
- k) proof that the contractor and every subcontractor is registered and in good standing with the compensation fund or with a licensed compensation insurer;

- l) the inputs of the safety officer, if any, into the health and safety plan;
- m) a copy of risk assessments made by competent persons;
- n) details of induction training conducted whenever it is conducted;
- o) proof of all subcontractor's induction training whenever it is conducted;
- p) letters of appointments for competent persons to supervise prescribed activities;
- q) proof of the following where suspended platforms are used:
 - i) a certificate of system design issued by a professional engineer, professional certificated engineer or a professional engineering technologist;
 - ii) proof of competency of erectors;
 - iii) proof of compliance of operational design calculations with requirements of the system design certificate;
 - iv) proof of performance test results;
 - v) sketches indicating the completed system with the operational loading capacity of the platform;
 - vi) procedures for and records of inspections having been carried out;
 - vii) procedures for and records of maintenance work having been carried out;
 - viii) proof that the prescribed documentation has been forwarded to the provincial director;
- r) records of the register of inspections made by a competent person immediately before and during the placement of concrete or any other load on formwork; and
- s) the names of the first aiders on site and copies of the first aid certificates of competency.

G4.8.2.2 The health and safety file shall be made available for inspection by any inspector, subcontractor, employer's representative, employer's agent, health and safety representative or employee of the contractor upon the request of such persons.

G4.8.2.3 The contractor shall hand over the health and safety file to the employer upon completion of the contract together with a record of all drawings, designs, materials used and other similar information concerning the completed structure.

G4.9 First aid, emergency equipment and procedures

The contractor shall where more than five employees are employed at a workplace, provide a first aid box or boxes at or near the workplace which shall be available and accessible for the treatment of injured persons at that workplace. Such first aid boxes shall contain suitable first aid equipment.

The contractor shall ensure that where there are more than 10 employees employed on the site that for every group of up to 50 employees at that workplace, at least one person is readily available during normal working hours, who is in possession of a valid certificate of competency in first aid.

G1005 MEASUREMENT AND PAYMENT

<i>Item</i>	<i>Unit</i>
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G10.1 Contractor's initial obligations in respect of the Occupational Health and Safety and Construction Regulations Lump Sum

Payment of the lump sum tendered shall include full compensation for all costs resulting from the Contractor's initial obligations complying with Occupational Health and Safety Act and its Construction Regulations and requirements in terms of health and safety requirements in respect of the contract as specified.

The full amount will be paid in one instalment only once:-

- (a) The contractor has notified the Provincial Director of the Department of Labour in writing of the project.
- (b) The contractor has made the required initial appointments of employees and sub-contractors.
- (c) The client has approved the contractor's Health and Safety Plan.
- (d) The contractor has set up his Health and Safety File.

<i>Item</i>	<i>Unit</i>
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G10.2 Contractor's time related obligations in respect of the Occupational Month

Health and Safety Act and Construction Regulations

The tendered monthly amount shall represent full compensation for that part of the Contractor's general obligations in terms of the Occupational Health and Safety Act and the Construction Regulations which are mainly a function of time. This includes inter alia payment of all costs for the appointment of all staff contemplated in the construction regulations and the transport of employees on site. Payment will be monthly only after payment for Item G10.1 has been made.

The lump sum tendered will be payable monthly instalments in relation to the month under consideration and the total time of the completion of the Works.

C3.5.2 ENVIRONMENTAL SPECIFICATIONS

This part of C3.5 Management contains specifications for Environmental matters not covered by C3.4 Construction Specifications.

The number of each clause and each payment item in this specification is prefixed with an H to differentiate these clauses and items.

SECTION H1000 : ENVIRONMENTAL MANAGEMENT

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H1001 SCOPE

The Contractor is required to comply with the requirements of the detailed EMP (to be provided upon award of contract) throughout construction.

The following are standardised additional specifications applicable. They are intended to assist the appointed Contractors to fulfill the environmental requirements of the project. The objective of the EMP is to ensure that the potential impacts upon the environment are minimised, and that upon completion of each section of work the area is left in a clean and sustainable condition.

Overall the environmental impacts of the project are considered to be low as long as the listed procedures are followed. These are given in the EMP.

The Contractor is advised that there are cost implications to the EMP and these must be factored into the tendered price.

H1002 ENVIRONMENTAL MANAGEMENT PLAN

H2.1 Objectives

The prime objective of the EMP is to minimise or avoid significant environmental impacts by using a pro-active approach and planning procedures.

The second objective is to have a plan in place to rehabilitate areas that have been impacted upon and, thirdly,

To have a plan in place for emergency situations that arise and are detrimental to the environment e.g. fuel or bitumen spills.

The Contractor will be responsible for the day-to-day implementation of the EMP, by himself and all other sub-contractors. During the course of construction regular compliance audits will be undertaken. This environmental auditing will be conducted by qualified environmental practitioners.

H2.2 Environmental Control

The Contractor will oversee the environmental aspects of the construction phase of the project in consultation with the Engineer.

The Contractor will report back to the bi-weekly site meetings with regards to compliance to the environmental specifications.

H2.3 Environmental Awareness Programme

The Engineer will implement an Environmental Awareness Programme for the Contractor, his staff, sub-contractors and all people working on the project. The initial session will be immediately prior to construction commencing.

H2.4 Method Statements

The Contractor shall submit written method statements for activities that are identified by the Engineer, as being potentially harmful to the environment, or for work that is to be undertaken in areas identified as being environmentally sensitive.

Such activities include dewatering of excavations, pumping, working with cement, erection of construction camps and fuel stores, etc.

The Method Statement shall cover applicable details with regard to:

- construction procedures,
- materials and equipment to be used,
- getting the equipment to and from site,
- how the equipment/ material will be moved while on site,
- how and where material will be stored,
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur,
- timing and location of activities,
- compliance/ non-compliance with the Specifications, and
- any other information deemed necessary by the Engineer.

Method statements shall be submitted at least 7 days prior to commencing work on the activity to give the Engineer time to study the method statement and consult with contractor and specialists and to obtain written approval of the method statements. The Contractor shall not commence on that activity until such time as the method statement has been agreed to in writing by the Engineer. This will be done within this 10 day period.

Any changes required to the method statements once construction has commenced must be agreed upon in writing with the Engineer before being instituted.

H2.5 Working Areas

Regardless of the extent of the work, the following applies to all of these areas:

- All materials must be stockpiled or stored in a designated area (at each site) avoiding sensitive areas.
- No materials must be left on site once work is completed neither may they be dumped at any other place on site.
- Litter bins and containers for waste materials must be provided by the Contractor at each site. Bins should be weatherproof and scavenger proof.
- All waste must be placed in the bins and containers. No waste may be left lying on the site.
- Visible anti-litter signs must be displayed around the waste collection points and all employees must be encouraged to observe site rules pertaining to solid waste management practices. A concerted effort should be made to collect and dispose of materials suitable for recycling, separately from the other solid waste.
- No burning or burial of waste is permitted.
- Any soils contaminated by the contractor must be removed or rehabilitated. If a significant amount of soil has to be removed fresh soil must be imported and the site rehabilitated by grading and planting vegetation.
- All waste must be removed to an authorised landfill site, or taken to a facility for recycling.
Any excess road building materials must either be:
 - taken to a site for stockpiling and future re-use,
 - (ii) used for localised rehabilitation, or
 - (iii) removed from site by the contractor for disposal.
- The contractor shall provide waste bins for solid waste collection and storage. Such bins should be placed at designated areas within the site. The refuse collected from the site must be removed for landfill disposal at least once a week.
- Vehicles may not park in the road reserve except with the prior permission of the Engineer.
- Every care should be taken to avoid damaging vegetation or land when vehicles are in use.

- Fuel tanks, pumps, and all equipment using oil, diesel, etc. must have drip trays. The drip trays must have sufficient capacity to contain liquids that will spill in the case of failure of the tanks, etc. The waste liquids taken from the trays must be disposed of at a landfill which permits disposing of liquid wastes.
- Only emergency repairs to vehicles and equipment may take place on site. Where emergency repairs take place it is the responsibility of the contractor to ensure that all waste (e.g. spare parts and oils) are removed from site as soon as possible. All other repairs must take place at a yard off-site, where facilities are suitable and waste facilities are appropriate.
- Whenever practical a tarpaulin should be laid down, prior to emergency repairs taking place, to protect the environment from contamination.
- No natural vegetation may be gathered, removed or destroyed in the course of the project, except where agreed to by the landowner.
- No hunting is permitted.
- Fires are prohibited.
- Erosion control measures must be implemented if the need arises.
- Pollution of water courses by any means must be avoided.
- No defacement of any natural or other features will be allowed; this includes markings for road works, unless markings are restricted to the road surface.
- Dust suppression measures should be implemented if and when required.
- Chemical toilets must be provided at all sites and must be within walking distance of the workers. They must be serviced on a regular basis in order to be kept clean and hygienic. The toilets must be placed in a sheltered place and should be locked after working hours if they are outside a camp area. Alternative arrangements to use existing toilets with owners' written consent may be allowed when submitted in writing.
- All waste from toilets must be disposed of at a permitted landfill or waste treatment works.

H2.6 On-site Workers Camp

H2.6.1 Site Camp

The campsite selection should be carried out in consultation with the landowner or relevant authority.

The site must be selected with due regard to the environment. Due care should be taken to avoid areas where sensitive vegetation and habitats occur.

When the site selection process has been completed, the contractor will define the boundaries of the site and erect a fence with a controlled access around it if practical.

All activities associated with the camp must be restricted to the demarcated area.

It is the responsibility of the contractor to ensure the safety of all personnel within the boundaries of the site. The contractor should have an on-site contingency plan detailing measures to be observed in the case of a health, safety or environmental emergency.

The contractor should ensure that all employees, employed by him and/or employed by subcontractors, have a clear understanding of safety regulations and procedures.

H2.6.2 Water, wastewater, and stormwater

Site occupants must have access to safe drinking water.

If water is stored on site a clear distinction should be made between drinking water and multi-purpose water storage facilities.

All water used on site must be taken from a legal source and comply with recognised standards for potable and other uses.

Wastewater that is contaminated with soaps, detergents and other undesirable materials, such as grease and oils, should be collected in conservancy tanks and disposed of safely in a wastewater treatment facility.

It is illegal to discharge water into a public stream if the quality does not conform with required health standards.

In all camps stormwater must be managed to prevent erosion.

Run-off will be diverted to control ponds so that silt may settle and any pollutants are trapped.

Subsequently, any pollutants must be treated, or removed and disposed of at a permitted landfill site or recycling facility.

All materials should be protected from the rain to prevent them being washed into stormwater channels.

H2.6.3 Ablution Facilities

The contractor shall provide proper and adequate sanitary facilities for all site employees.

These facilities shall be maintained in good and working condition at all times. Odours emanating from these facilities should be controlled within acceptable levels.

H2.6.4 Fires and Cooking Facilities

Fires will not be allowed.

The contractor must supply cooking facilities that are suitable for the environment and are not liable to cause the outbreak of fires. Fire fighting equipment must be supplied by the Contractor at suitable locations.

H2.7 Plant and Equipment Storage Facility

H2.7.1 Plant

At the end of the shift all plant should be driven or transported back to the campsite for proper and safe overnight storage.

The contractor should ensure that equipment left elsewhere is stored in a manner that will not impact negatively upon the environment.

The plant should be regularly inspected for fuel and oil leaks that may be harmful to the environment, and/or aquatic life if washed into a stream or river.

H2.7.2 Hazardous Materials

Hazardous materials should be stored under lock and key in designated areas with properly displayed and visible warning signs.

All storage of hazardous materials must comply with legislation and regulations.

H1003REHABILITATION

Upon completion of each section of work the site must be cleared of all equipment, waste and any rehabilitation work must be undertaken. This may include local grading of soils and re-vegetation where sites have been disturbed.

Immediately after the demolition of the campsite, the contractor shall restore the site to its original state, paying particular attention to its appearance relative to the general landscape.

It is imperative that any potential erosion problems are addressed. This may require subsequent site visits to monitor the efficacy of erosion control measures.

H1004EMERGENCY PLANS

The onus is on the contractor to assess the potential risks to the environment as a result of the project. For example, accidental spillage of materials may pollute the soil or any water body.

The contractor must draw up a suitable emergency plan to contain such pollution. The emergency plans and procedures must be taught to all the workers on site, so that everyone is prepared to cope with an emergency.

Appropriate equipment must be available to carry out the emergency plans.

H1005ENVIRONMENTAL AUDITING AND PENALTIES

On a regular basis, a qualified auditor will carry out a site audit to ascertain and verify the contractor's level of compliance with the requirements of the EMP

Transgression will be treated as a contravention of the contractual agreement.

Deviation from these prescribed requirements will be met with penalties that are intended to enforce compliance.

It is a requirement that the contractor keep concise records of mitigatory measures undertaken at each site to minimise environmental impacts.

Any emergency situations that impact upon the environment should be recorded by the contractor together with the action that was taken to rehabilitate and remediate the site.

A copy of all completed environmental audits will be given to the contractor and the employer by the auditor. Any public complaints regarding the environment must be recorded and discussed with the Engineer to determine an appropriate course of action.

The contractor will be responsible for all costs incurred in the rehabilitation of sites.

The contractor will be responsible for all costs incurred where emergency procedures are implemented to deal with accidents that impact upon the environment.

The contractor will be responsible for ensuring that all procedures required to rehabilitate all sites are implemented.

If third parties are called to the site to perform clean up and rehabilitation procedures, the contractor will be responsible for all costs.

Penalties will be imposed for contravention of the EMP, as specified in the EMP:

MEASUREMENT AND PAYMENT

No separate payment items have been scheduled for compliance with the EMP, and all the relevant cost of the Contractor are deemed to be covered in other relevant items in the schedule of quantities.

MECHANICAL PARTICULAR

SPECIFICATION

(PAM)

PAM 1 ANCILLARY EQUIPMENT

The Mechanical Contractor will also be responsible to compile a manual in which all the relevant mechanical equipment is described together with the routine maintenance, lubrication schedules etc for proper running of the plant. Details of spares and special tools are to be listed in the Data Sheet.

The Mechanical Contractor will be responsible for the supply, delivery to site and erection of all ancillary equipment, in the form of holding down bolts, rawl-bolts, pipe clips, small pipes, grease piping etc. to complete the Mechanical Contract.

PAM 2 PUMPS

SCOPE

This section of the Specification includes the manufacture, testing, protection, supply and off- loading of pumps and base-plates used for the pumping of raw or potable water at ambient

temperatures as stated. Pump duties shall be in accordance with the Project Specifications.

Electrical motors does not form part of this section of the Specification. This section of the Specification must be read in conjunction with the Project Specification and Electrical specifications.

INTERPRETATIONS

Abbreviations

For the purposes of this Specification the following abbreviations will apply:

BS	-	British Standards Institution
SABS	-	South African Bureau of Standards
DIN	-	German Standards Institute
ISO	-	International Organization for Standardization
SIS	-	Swedish Standards

Standards

Pumps shall comply with this Specification and with the current and most recent issues of the following standards where applicable:

BS 970	Wrought steel in the form of blooms, billets, bars and forgings
BS 1400	Copper alloy ingots and copper and copper alloy castings
BS 3100	Specification for steel casting for general engineering purposes
BS 3468	Austenitic cast iron
BS 4360	Specification for weld able structural steel
BS 4675	Mechanical vibration in rotating and reciprocating machinery
BS 4999	General requirements for rotating electrical machines
BS 5316q	Acceptance tests for centrifugal, mixed flow and axial flow pumps
BS 4504	Flanges and bolting for pipes, valves and fittings
SABS 20	Copper alloy ingots and castings
SABS 1123	Steel pipe flanges
SIS 05 59 00	Pictorial surface preparation standards for painting steel surfaces

MATERIALS

General

All materials shall possess qualities adequate for purpose for which they are to be used. All materials and properties claimed for these materials shall, unless specified otherwise in this document, comply with the requirements of the most recent edition of the appropriate South Africa or other internationally recognized standard specification.

For each type of equipment, the Manufacturer shall indicate the materials used for each of the proposed sub-assemblies.

The equipment shall be manufactured using new prime quality materials taking into account the latest technical innovations.

All components shall have a surface finish in relation to their importance, their position and their intended purpose.

Rolled steels and all castings shall be clean and free of blisters, porosity, shrinkage, holes, cracks or other flaws that may be detrimental to their use.

The Tenderer shall indicate in his tender the proposed materials for each component of the assembly.

Castings

No repair of cast components will be permitted without the prior approval of the Engineer.

The filling of casting defects shall be carried out by highly qualified welders only, according to the latest welding techniques.

Any cast component requiring filling at any fabrication stage after the first anneal shall be subjected to further annealing treatment unless stipulated otherwise.

Cast components shall not be wrapped or distorted in any way and shall not show any increase in dimensions (beyond that shown on the fabrication drawings) likely to cause interference with other components in the erection of the item of equipment for which they were made.

The structure of cast components shall be homogeneous and free of non-metallic impurity. If, at critical points of a cast component, there is too great a concentration of impurities or alloy, the component shall be rejected.

Pump Casings

Pump casing shall be of cast iron or cast steel. The grade of material proposed should be selected appropriate to the quality of water to be pumped as specified in the Project Specification.

Impellers

Impellers shall be cast in either phosphor bronze (PBI according to BS 1400 or 1 C according to SABS 200), aluminum bronze (AB1 according to BS1400 or 1E according to SABS 200) or chrome steel (316C11 according to BS 3100, or DIN 1.4313), unless otherwise specified in the Project Specification. Cast iron or leaded gunmetal shall not be permitted.

Pump shafts

Pump shafts shall be of EN 26 steel to BS 970 or similar

If a Tenderer wishes to propose an alternative material this should be motivated with details of the benefits to be achieved.

Stainless steel

The stainless steel used shall be of the type easily jointed or fitted by electric welding.

Stainless steel which cannot withstand the effects of welding or associated heat treatment will not be accepted.

Fasteners

All high tensile bolts and studs used shall bear the letters HTS stamped or engraved on the end. Washers shall be provided under all bolt heads and nuts. The threads of bolts and studs shall be cleaned and coated with a graphite/grease, copper based or other approved compound before assembly. The threads of all bolts and studs used with the equipment supplied shall be to the same standard. The length of bolts should be such that at least two threads protrude beyond the nuts, but not more than four threads. The threaded end of all bolts must point the downstream direction of flow

The Tenderer shall indicate in his tender the materials proposed for each part of assembly.

PLANT

The Tenderer shall satisfy the Engineer of the sufficiency of the manufacturer's workshops to handle the manufacture, testing and protection of the pumps strictly in accordance with the Specification.

MANUFACTURE

General

Preference will be given to Pumps with non-overloading characteristics and a shaft rotational speed not exceeding 1 500 r/min.

Pumps shall be of the highest quality and suitable for continuous operation over long periods with the minimum of maintenance at high sustained efficiency.

End-suction pumps constructed on the back pull-out principle shall be provided with spacer pump motor couplings to enable the pump bearing housing, shaft and impeller to be removed without disturbing the pipe work or alignment.

The proposed layout of the pump station shall be indicated on the drawings accompanying the tender documents. They shall be studied carefully and all alterations to the lay-out, pipe work or buildings required to suit the pump offered, shall be set out clearly in letters and drawings accompanying the tender. The final layout shall be agreed upon by the Contractor and the Engineer prior to the commencement of manufacture of any of the equipment.

All equipment offered as well as all work carried out, shall comply fully with the requirements of the Occupational Health and Safety Act 85/1993 and the Machinery and Operational Safety Act 6/1983.

Taking into consideration specific speed calculations, efficiencies and reliability of the pump sets the proposed pump types shall be justified in the Tender. Double-Suction Axially Casing Split Pumps will be preferred unless otherwise specified in the Project Specification.

Arrangements incorporating multiple pump units coupled in series to achieve the duties specified in the particular specifications will not be favorably considered unless otherwise specified.

The arrangements of impellers shall be such as to reduce the residual axial thrust to a minimum. Designs incorporating a double suction will be preferred.

A design and arrangement of the pump casing which ensures that it is not necessary to disconnect the delivery pipe work for the purpose of removing or replacing the complete rotating element will receive favourable consideration.

Suction and delivery details: The orientation of the suction and delivery pipes shall be such as to facilitate maintenance whilst being designed for minimum losses and no air traps.

Pump Characteristics

The pump shall have stable, non-overloading characteristics.

The Tenderer shall submit with this Tender for each pump offered the following characteristic curves.

With respect to flow (in m^3/s)

total head; in meters (0% to 120% of duty flow) power absorbed; in kilowatts (50% to 120% of duty flow) efficiency; (0% to 120% of duty flow) net positive suction head (NPSH) requirements: recommended, 0% head drop, and 3% head drop relative to pump shaft center line, in the case of horizontal spindle pumps;

- with respect to speed:

torque requirements rated in absolute units.

The Contractor may be called upon to provide further curves at the request of the Engineer, especially for starting and stopping analysis, in connection with surge analysis in the rising mains.

The efficiency curve shall be flat over a wide range in order to provide efficient working with various pump operating conditions. It shall conform to the requirements of the Project Specification.

Unless specified to the contrary, the proposed pumps shall be able to operate without

perceptible signs of cavitation in the full range of the operating envelope specified, pump sets running singly or in parallel. Throttling shall not be allowed. Should there be any doubts, the Contractor shall be called upon to carry out an inspection of the pumps and carry out NPSH tests to prove the equipment, at the Contractors expense. If the pumps are found to be faulty, the Contractor shall be given a responsible period to remedy the problem. Thereafter if the Contractors is unable to resolve the problem it shall be cause for rejection.

Pump Casings

No welding, burning, filling or plugging of defective castings shall be permitted without the Engineer's permission in writing, following an inspection of the defects.

The inspection and testing of castings and test bars shall be in accordance with BS 3100.

The dimension and drillings of the suction and discharge flanges integral with the pump casting shall be to SABS 1123 to design pressures specified.

The pressure rating of the delivery flanges shall be at least equal to the maximum suction static pressure, plus the pump shut-off pressure. The minimum pressure rating of the flanges shall be 1 MPa (10 bar).

All pump casings shall be hydrostatically tested at the Manufacturer's workshop and in the presence of the Engineer or his Representative. The test pressure applied shall be

equivalent to 1,5 times the pump shut off head, or alternatively twice the duty head specified, whichever is the greater.

Suitable lifting rings shall be provided on the casings.

The pumping casings should be fitted with suitable replaceable stationary wear rings. These wear rings should be appropriately heat treated for operation in conjunction with the impeller, or impeller wear ring material selected.

Impeller

The casting shall be free of blowholes and other defects. No welding, burning, filling or plugging of defective castings shall be permitted without prior approval being obtained from the Engineer in writing, following an inspection of the defects.

All water passages shall be polished to a smooth finish. Water passages which cannot be machined shall wherever possible be hand ground and filed to template.

Each impeller shall, after final machining and dressing, be independently statically balanced and the completely assembled rotating element with coupling shall be dynamically balanced.

The first critical speed of the rotating element shall be at least 1,3 times running speed.

Pump Shaft, Sleeves and Diffusers

Pump shafts shall be of an approved material, and of sufficient dimensions to transmit the power to which they will be subjected without undue torsional or bending stresses and deflection

The shafts shall be stress-relieved after initial machinery, and ground to final size.

The shafts shall be suitably designed for the reception of the impeller which shall be adequately secured to the shaft in such a manner as to be readily removable without damage to either the shaft or the impeller.

The Contractor shall ensure that both the critical speed and torsional oscillation characteristics of the combined pump and motor rotating elements are satisfactory for all possible condition of operation.

The shafts shall be adequately protected with replaceable sleeves of an approved bronze or other similar approved non-corrodible material at all areas where wear and/or corrosion could possibly be expected. The replaceable shaft sleeves exposed to the pumped water shall be manufactured from a material compatible with the impeller material selected. These sleeves shall be readily removable without causing damage to either the shafts or the sleeves.

Shaft Coupling

The pump and motor shall be connected by a flexible coupling in such a manner that it shall not uncouple whichever way the impeller may be rotating.

The coupling shall accommodate small axial, lateral and angular misalignments without imposing undue stresses on the shaft and bearings. Refer to PT 8.3.

The coupling shall be enclosed in a stationary solid-plate guard to the Engineer satisfaction.

Pump Bearing and Lubrication

Bearings and Lubrication

If anti-friction bearings are fitted a design life of at least 40 000 operating hours is required.

The bearings in the pump casing together with its lubricating systems shall be suitable for the particular circumstances. The particular type and system offered by the Tenderer shall be fully specified.

The pump rotating element shall be positively located in the axial direction. If specified thrust bearings shall be of the tilting pad-type (Mitchell or similar).

Journal bearings consisting of white metal lined bronze sleeves split on the horizontal centre line and lubricated with an oil ring shall be preferred.

All bearings shall be suitable for shaft rotation in both directions.

Preferably the same type of bearing will be chosen for motor and pump.

If not, the necessary allowance shall be made when aligning pump and motor.

Adequate provision shall be made for the cooling of oil for bearings, particularly as the pumps may run continuously in ambient temperatures of the order of 40°C.

Oil reservoirs of sufficient capacity shall be fitted with easily accessible oil level indicators, clearly marked to indicate the standing and running oil levels.

All internal surfaces in continuous contact with the lubricating oil such as oil reservoirs, piping, etc, shall be thoroughly cleaned either chemically or by shot blasting and protected by a method to be approved by the Engineer until such time as the system is changed with oil. No site welding of oil circulating pipes will be permitted.

The entire lubricating system shall be fail safe with alarms set to indicate automatic change-over to the stand-by unit.

Glands and Seals

Reliability

Reliability of glands is of prime importance. Pumps incorporating low pressure glands where the pressure at the glands does not exceed the main suction supply pressure will be preferred to pumps with shaft glands exposed to higher pressures.

Glands

Low pressure glands of the conventional stuffing box pattern utilizing packing rings one each side of lantern rings will be acceptable for the first stage of the pumps. Lantern rings shall be easily removable. The shaft sleeves shall be ground with a polished finish on the wearing surface, and the gap between the sleeves and the follower shall be such that the packing will not be extruded into the gap. Make and type of packing shall be to the approval of the Engineer.

It will be the responsibility of the Contractor to provide filters if the quality of the water necessitates filtration. The flow of water to or from the glands shall be clearly visible.

If mechanical seals are called for, they shall require no separate water supply and shall be suitable for the water to be pumped. Seal selection shall be done in collaboration with the seal manufacturer and proof that this has been done may be requested.

If, in the opinion of the seal manufacturer, the quality of the water is such that a flush would be required to the seals, Tenderers are required to provide for a suitable system. Such a system shall be self-contained and inclusive of all necessary separators, filters, connections and auxiliary pipe work to provide the required flow to the seals at the

appropriate pressure. The auxiliary pipe work and fittings should be in a suitable grade of stainless steel.

Mechanical seals shall be balanced and provided to be suitable for the water pumped. Spare wearing components shall be supplied and delivered when the pump is installed, the cost being included in the price of the pump.

The Tenderer shall supply with his Tender, full details of all pump seals and glands incorporated showing clearly all proposed materials, finished clearances, etc.

Pump Vent and Drain Fittings

Stainless Steel vent cocks be provided and fitted at all local high points on each pump casing. These cocks shall be of adequate size to enable the entrapped air to be released freely. Stainless Steel pipes shall be neatly led from priming cocks, gland and casing drain points to a suitable main tundish. Galvanized drainage pipe works of adequate size shall be provided and installed to collect the wastewater from each pump set and to lead it to the drain leading to the pump house sump.

Base-plate

The pump and motor base-plate shall be rigid. The upper face of each base-plate upon which the pump and motor are located, shall be machined flat and smooth to ensure that the pump is supported properly directly to the base-plate, without the use of spacers. Provision must be allowed to align the motor correctly to the pump through the use of suitable shims or spacers, the combined height of which should not exceed 3mm..

For every motor, two jacking bolts at right angles with a lock nut shall be provided at every corner.

Monitoring Devices

If specifically stated in the Project Specification, one or more of the following monitoring items shall be required:

Full details of the sensing equipment (thermocouples, etc), and of the associated control and monitoring or indicating equipment shall be submitted with the tender offer. Evidence shall also be submitted that adequate spares and services are readily available in this country.

Temperature Sensors

Either thermocouples or resistance temperature detectors shall be installed, depending on which is more suitable to the duty and application.

Location of temperature probes:

Separate temperature probes shall be installed at the sleeve and/or rolling bearings of each pump and motor and at the gland housings of the pump to monitor the temperatures at these points.

The probes shall be spring-loaded to ensure positive contact with the bearing shells or gland stuffing boxes.

Each probe shall be clearly identified by means of an engraved marking on the sheath and shall be individually calibrated. Test certificates covering the calibration results of all temperature probes shall be submitted to the Engineer.

Temperature detectors offered, shall be suitable for operation in conjunction with temperature indicating, monitoring, alarm and trip equipment of Conlog or equivalent design.

If grease lubricated bearings are offered, the Tenderer shall indicate if temperature detectors can in fact be used. If temperature detectors are not feasible, the Tenderer shall indicate alternative means of monitoring bearings.

Pockets for standard mercury filled glass thermometers shall be provided adjacent to all pockets serving temperature indicating instruments. Pockets for standard thermometers shall have chained covers to prevent the ingress of dirt when not in use and shall be so arranged as to permit the accurate measurements of the bearing temperature. The pockets shall contain a small amount of oil and shall therefore be orientated within 30° of the vertical, horizontal pockets are not acceptable.

Each pump casing shall be fitted with a thermo switch, Fenwall, or equal approved make to safeguard the pump in the event of inadvertent sustained operation against a closed discharge valve. The thermo switch shall be calibrated to close when the temperature of the water in the pump casing exceeds 40°C.

Pressure gauges

Each pump set shall be equipped with two 150 mm dial diameter flush mounting pressure gauges . The gauges shall be calibrated in kilopascal and the angle shall suit the particular application. The gauge shall be filled with glycerin, and the bubble shall be out of the range of usual reading. The gauges shall be of a type that is possible to recalibrate (dead-weight method) and reset on Site.

These meters shall indicate water pressure in kilopascal and shall have a range at least 50 % higher than the normal duty point. However, in all cases the gauges must have a range at least 30% higher than the shut off, or maximum, head which the pump is capable of generating with the system conditions taking into consideration the maximum static suction pressure possible.

The meters for the suction side of pumps shall be compound gauges and shall be capable of indicating a negative pressure of up to 100 kPa. However, in all cases the gauges must have a range at least 30% higher than the maximum static suction pressure possible.

All pressure gauges shall be supplied and installed complete with isolating Steel cocks, piping, etc. and fitted with a pulsation snubber in stainless steel.

Due to the quality of the water, those submitting tenders should satisfy themselves of the reliable operation of the gauges. Where necessary they must include for the pressure gauges to be fitted with diaphragms.

Pump set vibration sensors

Suitable vibration sensors shall be mounted on each pump set to stop it on detection of

Detection of excessive vibration. The sensors shall be situated as close as possible to those bearings where the highest vibration levels are encountered.

The monitoring of vibration shall be made via a suitable timing device in order to avoid tripping when starting the pump set or during other transitory conditions.

The pumps shall comply with the requirements of BS4999.

Automatic air vents

If an automatic air vent is specified for the pump casing, it shall be fitted with an indicator to show the open and closed positions of the air vent. The air vent shall be suitable for remote operation and the control of the air vent shall be mounted on the control panel inside the pump house.

Gland leakage detection

A device to monitor gland leakage shall be supplied and fitted with adjustable alarm contacts designed to close when gland leakage rises to a pre-set value.

Wear limit switch

Multistage pumps should be fitted with a wear limit switch to protect the pumps against damage after normal wear of the wearing rings have taken place after a period of operation.

Corrosion Protection

Internal protection

All traces of rust, slag, silica or other contaminants shall be removed by mechanical wire brushing. Abrasive blast clean all interior surfaces to SA 22 (near white) metal finish to the Swedish Standard SIS 05 59 00. The blast profile shall fall within the limits 40-60 microns.

A thorough vacuuming of the interior surface shall be carried out to remove all traces of the abrasive grit before application of internal surface finish.

Apply by brush, or airless spray, three coats of an approved two part epoxy coating, or equivalent, to give a dry film thickness of between 50 and 70 microns per coat. The intermediate coat shall be a different colour to the first and final coat. The total minimum dry film thickness for the complete system shall not be less than 150 microns.

External protection

All sharp edges, laminations and protrusions shall be removed by mechanical grinding, where after all traces of rust, slag, silica or other contaminants shall be removed by mechanical wire brushing. The entire surface shall be degreased using a suitable water emulsifiable degreaser. Surfaces shall be left clean and dry prior to coating.

One coat of zinc phosphate high build primer shall be applied (Plascon Code UC 183 or imilar) by airless spray to a dry film thickness of 75 µm, and left 8 hours to dry.

The primer shall be followed by one coat of universal undercoat, (Plascon Code UC 1 or similar) applied by brush, roller or airless spray to a dry film thickness of 30 µm.

This coat shall be left to dry for 16 hours.

The final coat shall be one coat of universal gloss enamel, (Plascon Code G or similar) applied by brush, roller or airless spray to a dry film thickness of 25µm. This shall be left to dry for 20 hours. Colour will be as directed by the Engineer.

Designation and Information Plates

Each pump shall be supplied with an information plate – preferably chromium plates – secured to the pump casing in a visible position indelibly marked with the following details:

Maker's name, pump type and serial number

Year of manufacture

Rated duty of pump in liters per second

Head in meters at rated duty

Pump speed in revs per minute

Impeller diameter

Mass of completely assembled pump in kilogram

Types and sizes of Bearings

Letters and figures shall be engraved, or embossed, not stamped

Interchangeability

Where two or more similar pump sets are required, the pumps and motors shall be interchangeable in all respects

TOLERANCES

The tolerances as specified in this Specification or the appropriate SABS or BS Standards, shall apply.

INSPECTION, TESTS AND COMMISSIONING

General

Contractors shall, if requested make available for inspection, their internal Quality System Manual, their Standard Procedure Manual and their Works Instructions. Preferences shall be given to Contractors who have been audited and found to satisfy the requirements of the ISO 9000 Quality system.

Inspection and tests required of the Contractor include the tests and inspections in the workshops and the inspections and tests at Site.

Depending on the results of the tests and inspections, penalties may be applied and, in certain cases, part or all of the equipment may be rejected, as set out hereinafter.

The cost of all tests and inspections shall be included in the Tender. For instance, the cost of commissioning and testing at Site shall be stipulated in the Price Schedule under the section provided or included as part of the cost of erection. (Except for the cost of power and water consumed.) No claim for traveling expenses or further time required for testing will be allowed.

Tenders shall fully acquaint themselves with the properties of the water to be pumped. Any wear of portions of the pump or ancillary equipment that will affect its operating efficiency during the Period of Maintenance will result in the pump set being rejected.

Sign of cavitation pitting on pump parts will not be acceptable.

Leakage from any oil, water or air circuit will not be acceptable.

Leakage at the glands shall be controlled to the minimum required and drained to the Pump Station sump.

Operation of pumps shall be free from undue vibrations throughout the full range of normal running conditions. Vibration levels should not exceed the limits determined by VDI 2059 for good vibration behaviour.

In no case shall temperature-rise above the ambient temperature reach or exceed 40°C for any mechanical component. For temperature-rise of bearings see Clause PT 5.7.7.

In the case of routine tests concerning standard equipments or material quality control tests, not attended by the Engineer or his Representative, tests reports or certificates in duplicate shall be submitted to Engineer.

The Contractor shall notify the Engineer or his Representative in writing two weeks in advance, of the place and dates at which the equipment may be inspected and tested.

The Engineer or his Representative will inform the Contractor of his intention to attend the test or the inspection and propose a date which suits him. If the date preferred by the Engineer is later than ten days after the first possible date, the Contractor shall be entitled to perform the test or inspection without the presence of the Engineer.

If on any agreed date the equipment to be inspected or tested is not ready and the test or inspection has to be postponed the Contractor shall be held responsible for the traveling and/or living expenses of the Engineer and/or his Representative.

When tests and inspection have met the satisfaction of the Engineer or his Representative a certificate of Workshop Acceptance will be issued by the Engineer. The Contractor shall not pack and dispatch to Site any equipment before receiving the relevant "Certificate of Workshop Acceptance."

The Engineer's acceptance shall in no way relieve the Contractor of any obligation with regards to the Specification.

Tests

Performance tests

Each pump complete with its driving unit shall be tested at the Manufacturer's works, or other location approved by the Engineer to "Class B" requirements of BS 5316 Part 2, and the efficiency carefully measured. Variations from the actual running conditions of the pumps are allowed as defined in the standard. Unless otherwise explicitly mentioned, cavitation tests are required at work.

The tests shall be witnessed by the Engineer or his Representative and details of the tests and the results obtained, duly signed by the appointed Witness, shall be submitted to the Engineer before dispatch of pumping units from the Manufacturer's workshop.

The rotating elements of the pumps and motors shall preferably be dynamically balanced before assembly. The residual unbalance should be better than ISO 1940 grade G 6.3. The good balance of the whole pump set will be checked by measuring the absolute vibration of pump and motor bearing housings.

Tests shall be performed with the pump set on sound foundations, similar to those expected at Site.

Measurements shall be taken in the three axes at each bearing, i.e. axial and two radial components at right angles to each other.

Performance and vibration tests as described above are to be performed before installation on Site for all pump sets more than 22 kW. If these tests are impractical or impossible at the pump manufacturer's works, Tenderers must state this in their Tender and explain the reasons why it is so. The Engineer may be prepared to consider alternative proposals for testing provided these proposals are submitted with the Tender and are clearly described and defined. If this is not done, the Tenderer will be penalized for the cost necessary to have the tests performed in another workshop.

All pieces of equipment subject to water, oil or air pressure shall be tested at a pressure not less than one and a half times the design pressure.

Each piece shall withstand the hydrostatic test pressure without exhibiting signs of sweating, undue deformation and stressing, or defect of any kind.

Hydrostatic testing shall be done with blank flanges bolted on the flanges of the piece. The use of tie-bolts or other forms of restraint applied across the blank flanges to restrain the bodies from deflecting under the applied test pressure will not be permitted without the Engineer's approval.

The hydrostatic test pressure shall be maintained for a period of at least 10 minutes.

Performance Test Results

At Works

The overall percentages of efficiency as calculated from the tests should not be less than the appropriate guaranteed figures at the duty points by more than 3%.

b) The measured flow rates should not differ from the guaranteed deliveries at any point other than the duty points on the characteristic curves as supplied by the Tenderer by more than 5%.

c) The NPSH requirement should be met for the specified duty point. Where requested by the Engineer additional tests will be required to demonstrate the pump performance at run out conditions, or where the NPSH available is critical

The Contractor will be allowed a period of eight weeks to carry out any amendments to the plant which he may consider necessary to meet the guaranteed figures. Any period granted for design amendment shall not extend the Contract Period.

Further tests shall then be carried out at the Contractors expense and if the test results in question are still not within the limits specified, the Engineer shall have the right to:

either reject the entire plant and recover all monies already paid to the Contractor, or let the Contractor continue with the installation of the pumps sets which may be subjected to penalties or rejection as defined hereinafter then the performances tests at Site are performed

At Site

At the time of performance tests at Site:

should the test results obtained for either efficiency, flow rate, NPSH or vibration still vary beyond the limits indicated in clause PT 7.3.1 above, the Contractor will again be allowed a further four weeks to make such amendments as may be considered necessary and if after these amendments have been made the test results in question are still not within the figures which have been guaranteed, the Engineer reserves the right, according to circumstances, to reject the plant entirely

any other discrepancies, abnormal wear or malfunctioning of plant which may be observed during the Acceptance Tests shall be corrected by the Contractor without delay.

The date of completion shall be the date on which the Acceptance Tests at site have been satisfactorily completed and the plant is in a fully operational state in accordance with the Specification.

Any period granted for design amendments shall extend the Period of Maintenance by a corresponding amount.

Commissioning

On completion of mechanical and electrical erection and as soon as water is available and other circumstances permit, the Contractor shall arrange for the commissioning of all units of the pumping plant in the presence of the Engineer. The Contractor shall ensure that his equipment is suitably prepared before giving the Engineer fourteen days notice in writing of the date of commissioning.

Before the commissioning, the Contractor shall satisfy himself and subsequently prove to the Engineer that all items on the following checklist have been checked and are functioning correctly.

- Visual check of general appearance of plant.
- Check power supply to motor available.
- Determine the direction of rotation.
- i) Remove coupling
- ii) Correct if necessary

Check if pump is turning freely by hand.

Check axial float of pump

Check thermocouple operation/calibration if required.

Check if pump requires gland packing (Mech. Seal flushing).

Check pumps and motors for correct grade and quantity of bearing lubricants (oil/grease packed).

Alignment of pump and motor.

Suction valve open (bypass open).

Discharge valve closed (bypass open).

Check if discharge line is full of water.

Bleed of air on pump and pipe works.

Cooling water to bearings.

Check balancing water if required.

Monitoring and operating equipment are functioning correctly.

Test run of pump.

- i) Number of recommended start - stop of motor.
- ii) Bearing temperature (motor and pump).
- iii) Pump speed.

Suction pressure.

Discharge pressure.

(Volts) (Amps) (kW).

Quantity pump is pumping.

Vibration levels.

Rundown time of pump and motor.

Simulate an emergency shut-down of pump.

Check pump and pipe work for water tightness.

NOTE: The Contractor to ascertain from the Pump Manufacturer whether the items on the check list are sufficient for the successful commissioning of the pump sets.

- c) The pump sets shall be run without interruptions separately for at least 4 hours or such further time as may be required to reach stable operating conditions (particularly, motor temperatures shall be stable).
- d) If the prescribed duration cannot be achieved, the initial commissioning shall take place at a date to be agreed upon by the Contractor and the Engineer. It is to be borne in mind that the penalties for late delivery shall be linked with the initial commissioning.

After the above commissioning, the plant shall be run under approved supervision for not less than two months before the Acceptance Tests are conducted. The Contractor must satisfy himself that the operators are in a position to operate the plant safely and correctly should he be absent from Site during this period.

Commissioning shall not be considered to be complete until the plant is capable of continuous operation by fully trained operators of the Employer and until two months have elapsed and the plant has passed the Acceptance Tests as specified.

The Acceptance Tests shall be performed only if and when every item of the whole Contract is fulfilled and if and when each piece of equipment, including the monitoring and control devices, is working properly. The Engineer is entitled to postpone the Acceptance Tests if any part of the Contract is not to his satisfaction or if the plant has not been successfully operated for at least 200 hours.

The Certificate of Commissioning for the equipment is issued by the Engineer only when the results of the Acceptance Test, recorded in a report prepared and submitted by the Contractor, are found satisfactory.

Final Operation and Maintenance Manuals shall be made available before the Certificate of Commissioning is issued.

The Period of Maintenance (or Guarantee Period) commences at the date of the Certificate of Commissioning.

During the first 14 days of operation of the scheme, the Contractor shall be on site to rectify any problems with the scheme within 24 hours of being telephonically notified. During the remainder of the maintenance period, the Contractor shall within 14 days of being notified, commence rectifying any possible problems that the Employer may encounter with the equipment supplied under this Contract.

Should the Contractor fail to meet the above requirements, the Employer may appoint others to undertake the necessary repair work at the Contractor's cost

After the satisfactory conclusion of the Acceptance Tests on Site and the issue of the Certificate of Commissioning, the Contractor shall guarantee the satisfactory operation and functioning of the entire plant covered by the Certificate of Commissioning for a period of twelve months measured from the date of the Certificate of Commissioning.

The Contractor shall make good, free of all charges, any defects arising during this Period of Maintenance including the replacement of all defective parts and their installation and commissioning. This guarantee shall apply to all defects arising during proper use of the plant, due to faulty design or maintenance instructions, inferior materials or poor workmanship.

Maintenance by the client's personnel during the Period of Maintenance shall be limited to cleaning and lubrication only as instructed by the Contractor. All other maintenance or adjustments shall be carried out by the Contractor

The final Certificate will be issued by the Engineer when the Period of Maintenance has elapsed and all Contractual obligations have been met in accordance with the General Conditions of Contract.

INSTALLATION OF PUMP SETS

Couplings

All pumps are to be matched for coupling to their respective motors. Couplings shall impose no restriction on normal end play or expansion and shall be provided with a removable guard, painted red. The direction of rotation shall be indicated with a clear arrow painted on the exterior of the coupling guard. The latter shall be designed thus to render reversed mounting impossible.

Grouting of Base-Plates

Base-plates shall be grouted after the alignment of pump sets has been approved. The Contractor must provide details of the grouting procedure he intends to utilize. Grouting of base-plates shall be done by the Contractor and he shall ensure full grout penetration between each pump base and relevant base-plate.

Pump Set Alignment

General

It is accepted that all new pump sets have been aligned on the base-plates in the factory. A certain amount of base-plate deformation is possible during transit and installation. Therefore, the alignment shall be rechecked on site following a hot run as specified hereafter. Two main checks are to be carried out, viz.

angular alignment and radial alignment of the pump shaft

The checks are to be done on all pump sets.

Preparation

Before any check, the following preparations shall be completed.

Final grouting to the base-plate shall be completed.

Driving units shall be isolated from the power supply. The Contractor shall ensure that no damage can be caused by turning either unit (driving or driven unit).

Couplings should be fixed to their respective shafts and the segments must be free to move relative to each other. Where the method of coupling is too tight to allow free movement between the two half-couplings the rims should be marked so that readings can be taken when the two marks are in line.

Alignment Checks (See attached Data Sheet)

Angular Alignment

- i) Clamp two clock gauges diametrically opposite coupling pin holes of the driving or driven half-coupling, the plunger ends resting on the back of the opposite half-coupling.

With one gauge at the top and one at the bottom set both gauges to zero.

Turn both couplings through 180° . If the alignment is correct, the readings on the gauges should be numerically the same, although not necessarily zero.

Adjustment should generally be made on the outboard end of the pump.

Turn both couplings through 90° and set the clock gauges to zero. Repeat step (iii).

Note: This method does not require axial location of either half coupling.

Intersection of Axis (Radial Alignment)

i) Clamp one clock gauge into one of the coupling holes in the driving or driven

half-coupling, the plunger end of the clock gauge seating on the rim of the other coupling.

Rotate the couplings together and note the readings at each quarter turn.

Adjust the position and heights of the units until uniform clock readings are obtained.

Note: Where the operating temperature of a unit has the effect of lifting the centre line of one machine in relation to the other, allowance in the height of the appropriate machine must be made. Height adjustment must be in accordance with the manufacturer's specifications.

Tolerances

- i) Angular Alignment: The angle between two half-couplings shall not be more than 0,01° for speeds up to 1500 rpm. This corresponds to a variation of 0,05 mm and 0,02 between readings on a 300 mm dia coupling.
- ii) Redial Alignment: If readings vary by more than 0,10 mm (i.e. 0,05 mm eccentricity) for 1500 rpm adjustments shall be made.

Grouting of Base Plates

- i) A gap of approximately 25 mm is provided between the base-plate and top of the foundation.

Following approval of initial pump set and pipe work alignment, The Contractor shall erect suitable formwork along the base-plate perimeter and shall grout the entire aforesaid gap, foundation bolt pockets and base-plate volume up to the top surface of the base-plate. Appropriate grout holes shall be provided on the base-plate surface for this purpose. The Contractor shall timeously, prior to erection, submit to the Engineer full details of the grout type required, which should attain a design compressive strength of 30 MPT within 10 days.

Prior to execution of final shaft alignment checks, the grouting operation shall have been completed, the grout adequately cured and all foundation bolts tightened.

Final alignment control checks to be performed in the presence of the Engineer (or his appointed representative), immediately following a hot run.

Alignment Control Sheets will be completed for every unit checked, and will be signed by both the Engineer and the Contractor. The original copy will be kept by the Engineer and a duplicate by the Contractor.

For alignment control sheet, see attached.

Installation of Dowel Pins

Following approved alignment of pump sets, suitable dowel pins shall be fitted to facilitate correct re-location of pump sets.

Manufacturer's Certificate of Approval

Following wet commissioning of pump sets, the pump manufacturer or his approved supplier shall check the installation and when satisfied shall issue to the Engineer a certificate approving installation in compliance with the manufacturer's specifications.

The Contractor shall furthermore, upon commissioning, perform vibration tests in the horizontal and vertical planes of each and every bearing housing. The results are to be endorsed by the pump and motor manufacturers for acceptability and handed to the

Engineer within 14 days from the commencement of the Defects Liability Period.

It is further required of the Contractor to perform same measurements upon each and every maintenance visit during the Defects Liability Period. The results shall be logged and shall be endorsed by the pump and motor manufacturers for acceptability and handed to the Engineer within 7 days after each maintenance site visit.

MEASUREMENT AND PAYMENT

Measurement and payment will be done in accordance with the methods stated below:

Supply and Delivery

Pump sets/motor will be measured per unit including the following:

Pumps, motors, couplings, coupling material, base-plates and monitoring items as individually itemized.

Design, manufacture, purchase, protection, supply, handling, transport and profit.

Fixing material required to secure monitoring equipment to pump/motor.

Fixing material required to secure the pump and motor to the base-plate.

Temporary storage and maintenance during storage, should it be required.

The required tests and inspections at the manufacturer's work.

Operating and Maintenance Manuals as well as drawings in accordance with the specification.

Commissioning of each pump set/motor as specified.

Individual Performance Checks

Pay – item	Unit
------------	------

Performance testing of pumps/motors

by independent institutions

(Provisional item)	No
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Should the Client require performance testing of the pumps or motors by independent institutions such as the South African Bureau of Standards, a separate pay-item will be provided in the Schedule of Quantities. The tendered rate shall include for the transporting to and from the institution, off loading, handling, etc., as well as all fees payable to the institution for each pump/motor unit tested.

ANCILLARY EQUIPMENT

Details of spares and special tools are to be listed in the Data Sheet.

The Mechanical Contractor will be responsible for the supply, delivery to site and erection of all ancillary equipment, in the form of holding down bolts, rawl-bolts, pipe clips, small pipes, grease piping etc. to complete the Mechanical Contract.

The Mechanical Contractor will also be responsible to compile a manual in which all the relevant mechanical equipment is described together with the routine maintenance, lubrication schedules etc for proper running of the plant.

ALIGNMENT CONTROL SHEET

CLIENT:.....

CONTRACT NO:

STATION:.....

MACHINE TYPE:

UNIT NO:REF NO:

ALIGNEMENT BETWEEN:

FACE TO FACE

PERIPHERAL

METHOD OF ALIGNMENT: Dial indicator

READINGS GIVEN IN: mm

ALIGNMENT OF GEAR FITTED O:.....



MEASUREMENTS TAKEN ON:

WICH SHAFT ROTATED:

VIEWED FROM:

DISTANCE BEWEEN SHAFT ENDS:

WHEN SHAFT IN WHICH AXIAL POSITION:.....

REMARKS: Suction / Delivery pipes connected.

All foundation bolts tightened / loose.

Final grouting done / not done.

.....

.....

Date:

Time:

.....

CONTRACTOR

.....

ENGINEER

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PAM 3 MANUFACTURE AND SUPPLY OF VALVES

SCOPE

The section of the Specification includes the manufacture, testing and supply of valves for the conveyance of raw or potable water at ambient temperatures in pipes under pressure.

STANDARDS

The most recent issues of the following standard specifications will apply for the purpose of this Specification.

SABS 144	:	Cast-iron single door reflux valves
SABS 191	:	Cast steel gate valves
SABS 192	:	Cast steel single door reflux valves
SABS 664	:	Cast iron gate valves for waterworks
SABS 665	:	Cast iron gate valves for general purposes
BS 5155	:	Cast iron and carbon steel Butterfly valves
ISO 2441	:	Pipeline flanges for general use – shapes and dimensions of pressure tight surfaces
SABS 1123	:	Steel pipe flanges
SIS 05 5900	:	Pictorial surface preparation standard for painting steel surfaces

MATERIALS

Sluice Valves

The valve body, bonnet, thrust dome, gate and glands shall be cast iron or cast steel as specified and depending on the required test pressures.

Body and gate sealing rings shall be of bronze, gunmetal or stainless steel. RSV gate shall be nitrile rubber covered, and fully encapsulated. The rubber shall not be removed from the guides of the gate.

Spindles shall be of high grade stainless steel.

An isolating valve must be able to check the specified water pressure from both sides.

Butterfly Valves

Valve bodies and discs shall be of high-grade cast-iron or cast steel as specified and depending on the required test pressures.

The disc shaft or stub-shaft shall be of stainless steel located in self-lubricating bearings.

Sealing rings, seal retaining rings, body seat rings and associated screws shall be of stainless steel.

A butterfly valve must be able to check the specified water pressure from both sides.

Reflux Valves

Valve bodies shall be of cast iron or cast steel depending on the specification or test pressures.

Valve doors shall be of cast iron or cast steel.

The valve body and doors or disc shall be fitted with replaceable stainless steel body and door seat rings.

Air Valves

Valve bodies, covers and shield plates (large orifice) shall be of cast iron.

The balls shall be of stainless steel.

Manufacture

General

The design pressure of the valves shall not be less than the pressure specified subject to a minimum of 1000 kPa.

All valves shall be double-flanged with bolt holes drilled off-centre all in accordance with the requirements of SABS 1123 or as otherwise specified.

The Tenderer shall give as a function of the downstream pressure the maximum acceptable discharge of water through the valves without risks of vibration and cavitation. The Tenderer shall also submit the head-loss characteristics of the valves.

The design pressure will be hand stamped on the top edge of the flanges of valves in kPa.

If specified, valves shall be supplied with by-passes to be bolted on to the body of the valve and not to the adjoining pipe work.

Valves shall be fitted with position indicators if specified. Fully closed, fully open and intermediate positions shall be indicated in corrosive proof and robust design indicators.

Arrows shall be cast on all hand wheels together with the wording "TO OPEN" or "TO CLOSE". The closing direction shall be clockwise unless otherwise specified.

In the case of cap top valves, an aluminium disc of at least 100 mm diameter and with the same wording and arrows shall be slipped over the spindle and retained by the cap.

All valves shall be supplied complete including bolts, nuts, washers and gaskets in accordance with the class of valve. Bolts shall be of sufficient length to allow not more than three screw threads to protrude outside units after complete tightening of the assembly.

Gaskets for flanged joints shall be of compressed asbestos fiber to BS 2815 Grade A and full faced with a minimum thickness of 3mm for pressures up to and including 1 600 kPa cloth-inserted rubber may be used.

The following information shall accompany the tender:

Description

Flange Drilling

Maximum working pressure

Maximum unbalanced pressure

Test pressure

Manufacturers number

Material of components

Gearing

Accessories

Sluice Valves

Double-flanged, wedge-gate, internal (non-rising) spindle sluice valves of the waterworks pattern are required to comply fully with SABS 9191 or SABS 664 where applicable.

Only full-way valves will be accepted (i.e. the gate must be clear of the waterway in the fully open position).

The maximum force required to turn the hand wheel at the maximum torque shall not be greater than 100 N per hand at the hand wheel run (Total effort = 200 N) when operating at an unbalanced pressure equal to the rated working pressure of the valve. This may be achieved with the aid of gearing of a suitable ratio.

Where gears are used replaceable shear pins shall be provided to prevent damage to the valve if excessive pressure is used.

Butterfly Valves

Horizontal spindle type butterfly valves complete with gearing, hand wheels and flanged at both ends with separate bolting for joining to the adjacent pipe work is required.

Wafer valves or valves fitted with studs for attachment to the adjacent flanges are not permitted.

Valves shall be drop-tight when closed and metal to metal sealing is not acceptable.

All resilient seals shall be removed and readily replaceable on Site with the valve in position.

Resilient seals shall be retained by corrosion resistant securing elements to prevent corroding in position (e.g. bolts, set screws, etc.)

The valve-water seal shall be of the following types:

a resilient seal fixed to the edge of the disc by corrosion resistant securing elements sealing on a stainless steel or bronze insert fixed in the body.

a resilient seal fixed to the body of the valve by corrosion resistant securing elements sealing on a stainless steel or bronze insert fixed in the edge of the discs.

Reflux Valves

Reflux valves shall be double-flanged and comply with SABS 144.

Valve bodies and seals shall be free of pockets that will allow dirt accumulation and prevent the doors from closing fully.

Stops or an approved resilient material shall be fitted into the body to prevent the doors from fluttering under full flow conditions.

Valves shall be designed to allow for rapid but non-slamming closing characteristics.

Air Valves

Air valves shall be supplied with double-flanged, wedge gate internal (non-rising) spindle sluice valves for isolation, which unless otherwise specified shall confirm in all respects to this specification.

Electric Actuators (Applicable for Valves and Sluices)

When specified, the valves shall be fitted with electric, motor-driven flood proof IP 67 actuators of robust design, capable of closing the valves under all unbalanced pressures.

The Tenderer shall state the maximum torque required to operate the valve in his Tender.

In determining this maximum torque an allowance shall be made for any deterioration that could be expected to occur in the bearings during the life of the valve. The actuator shall be capable of transmitting twice this maximum torque without any of its components suffering permanent damage. This shall be proven to the Engineer's satisfaction by workshop tests.

The actuators shall be capable of restraining the valve in any position under all possible conditions of operation, and shall not, in any circumstances, be capable of becoming self-motorized as a result of the dynamic torque loading on the disc or plunger.

All gearing shall be manufactured in accordance with BS 436 Class C and shall be machine cut. All components requiring lubrication shall be adequately lubricated and totally enclosed flood-proof casing fabricated in cast iron and/or die cast aluminium to suit the service weather proof casing whether the valve is to be installed in the open or under cover. Actuators shall also be fitted with mechanical stops to prevent excessive turning and shall be provided with replaceable shear pins.

Hand wheel shall be fitted to all actuators. The direction of rotation to close the valve shall be clockwise when viewed from above the end of the input shaft and from the position of operation. In addition, they shall be clearly and indelibly marked with an arrow showing the direction of closing and the words "Close" and "Toe".

Whether the valve is actuator driven or manually operated, the maximum force required to turn the hand wheel at the maximum torque defined above shall not be greater than 100 N per hand at the hand wheel rim. (Total effort= 200 N.) For large valves the minimum of complete revolutions of the hand wheel to move the valve gate from fully open to fully closed shall not be less than 100.

All electric actuators shall be provided with reversing contactors: local and remote control shall be provided; a device making the local control non-operative shall also be provided on the relevant remote control panel.

After factory tests, the actuators shall be removed from the valve and delivered to Site in separate boxes to safeguard against damage.

Protection

All materials and workmanship to comply with relevant SABS specifications.

Internal Protection

Internal surfaces of valve bodies and discs shall be grit blasted to a 2 1/2 of SIS 05 50 00 finish. Successive coat of an approved non-toxic epoxy resin paint suitable for spray application (Cupon EP 2300 or similar) shall then be applied to give a final dry film thickness of 250 µm. Drying times between successive layers shall be strictly in accordance with the requirements of the paint manufacturer

As an alternative to the protection as specified above, the Contractor may be required to use either a solvent less epoxy paint system or a fusion bonded epoxy powder coating as specified in the Project Specification.

External Protection

External surfaces of valve bodies shall be wire brushed to a 3 of SIS 05 59 00 standard and painted with one layer zinc chromate primer to SABS 679 Type I (dried film thickness 50 µm). This will be followed by two alkyd-based undercoat (each coat 25µm thick) and one alkyd-based enamel finishing coat to SABS 630 Grade 1 (dried film thickness 25 µm). Final colour will be as specified by the Engineer.

Machined flanges will be painted with a protective coating of shellac or similar.

Tolerances

Tolerances as specified in the appropriate SABS or BS standards shall be apply to this Contract.

Testing and Inspection

Testing by Manufacturer

The Manufacturer shall carry out all tests to ensure that valve materials confirm to the requirements of the relevant SABS or BS Specification. These test will not necessarily be attended by the Engineer but records must be kept and all test results shall be made available to the Engineer.

Testing by Independent Body

The Engineer may appoint an independent recognized body to conduct control tests. Samples required for such tests will be provided by Manufacturer free of charge and sampling will be done by this body in accordance with the relevant SABS or BS Specification.

The cost of such control tests will be borne by the Employer.

Inspection

Visual, operational and dimensional inspection of valves as well as inspection of protective coatings will be carried out by the Engineer and/or the Manufacturer in the Manufacturers workshops prior to the dispatch of valves to site.

Inspection by the Engineer shall in no way relieve the Manufacturer of any of his obligations to design, manufacture and supply valves strictly in accordance with the Specification.

Hydrostatic Testing

All hydrostatic tests will be witnessed by the Engineer and the Manufacturer will give at least one week prior notification to the Engineer of the proposed dates for such tests.

Valve bodies will be close end tested to at least 1,5 times the working pressure. Test pressures will be maintained for at least 5 minutes and valve bodies will be watertight in all respects at the test pressure.

Assembled valves will be open-end tested to 1,5 x working pressure for materials strength and soundness. Valves will be drop tight from both directions over the complete range of pressures from 0 to 1,5 x working pressure.

Each valve will be supplied with a test certificate certifying that it complies in all respects with the requirements of this Specification.

Measurement and Payment

General

Tendered prices shall include for the following unless otherwise specified in the Project Specification.

Protective coating as specified.

Couplings and/or jointing material for each type of valve.

Packing and temporary protection against damage during transport and delivery.

Temporary storage and maintenance if required.

Delivery and storage of material on site or in a store as specified.

Testing and inspections at Manufacturer's works.

Valves will be measured per unit of each type.

ANCILLARY EQUIPMENT

Details of spares and special tools are to be listed in the Data Sheet.

The Mechanical Contractor will be responsible for the supply, delivery to site and erection of all ancillary equipment, in the form of holding down bolts, rawl-bolts, pipe clips, small pipes, grease piping etc. to complete the Mechanical Contract.

The Mechanical Contractor will also be responsible to compile a manual in which all the relevant mechanical equipment is described together with the routine maintenance, lubrication schedules etc for proper running of the plant.

PAM 4 MANUFACTURE, SUPPLY AND TESTING OF STEEL PIPES

SCOPE

This specification covers the manufacture and supply of bare, electric welded low carbon steel pipes and steel pipe special items for the conveyance of water at ambient temperatures and at medium pressures.

STANDARDS

Pipes and specials shall be manufactured, tested and inspected in accordance with the latest issues of the following standard specifications unless amended in subsequent clauses in this specification.

Pipes

SABS 719 : Steel Grades A, B and C

SABS 1431 : Steel Grades 300 WA

API 5L : Steel Grades x46, x56 and x60

Specials

Specials of 150 mm nominal diameters and smaller to be manufactured with pipe conforming to ASTM Schedule 40.

Specials larger than 150 mm nominal diameter shall be manufactured from pipes complying with this specification.

The radiographic technique, adjudication of radiographs and repair of defects shall be in accordance with API 1104.

Qualifications of Welders

All manual or semi-automatic welds and repair welds shall only be undertaken by welder's qualified under the tests laid down in accordance with API 1104

d) Non-destructive Tests and Adjudication

Radiographic inspection : API 1104

Ultrasonic inspection : API 5L

e) In this Specification reference is made to the latest issues of the following specifications.

SABS 719

API 5L

API 1104

ASME Section V

BS 2971

BS 2633

STRESSES

All pipes shall be hydrostatically tested as described in PLN 6.5 to a pressure such as to produce a circumferential tensile stress in the steel of not less than 90% of the minimum yield stress.

The design stress for pipes subjected to the specified design pressures shall be 60% of minimum yield stress of the steel.

PROCESS OF MANUFACTURE FOR PIPES

Pipes shall be manufactured by an approved semi automatic submerged-arc welding process or shall be electric resistance welded. Where semi automatic submerged-arc welding is employed, at least one pass shall be made on the inside and at least one pass on the outside. The number of longitudinal weld seams shall not exceed:

one seam for pipes up to 1 000 mm nominal diameter two seams for pipes larger than 1 000 mm and up to 2 000 mm nominal diameter Circumferential welds by semi automatic submerged-arc welding method for factory double jointed pipes shall have at least one pass on the inside and at least one pass on the outside.

Welds

SABS 719, BS 2971 and BS 2633 shall generally apply.

For fusion welded pipes and specials, the internal weld bead shall not protrude more than 1 mm into the bore of the pipe or special.

For electric resistance welded pipes, the height of upset metal and flash on the inner surface shall not exceed 1,0 mm.

For pipes to be jointed by butt welding, the internal weld bead shall be ground flush with the pipe body for a length of 200 mm from ends to be jointed.

For pipes to be coupled by flexible couplings, external weld reinforcement or upset metal and flash shall be ground flush with the pipe body for a length of 200 mm from the end to be coupled.

DIMENSIONAL REQUIREMENTS

Pipes

All dimensions will be in accordance with SABS 719 clause 4.

Specials

The tolerances on specials will be in accordance with BS 534, Section 4.

TESTING AND INSPECTION AT MANUFACTURER'S WORKS AND AT SITE

General

Factory and Site inspection, supervision of tests and adjudication of test records shall be carried out by an independent Inspectorate.

Tests and inspections shall be carried out at the manufacturer's work at the expense of the Contractor who shall provide all necessary testing facilities, labor, instruments,

equipment and samples that might be required, free of charge. The Inspectorate shall be afforded every facility during the course of manufacture and testing to enable the inspection to be carried out effectively.

All test samples shall be selected by the appointed Inspectors and all instruments used for testing purposes shall be approved by the Inspectors and if in the opinion of the Inspectors any instrument should require calibration, such instruments shall be calibrated at the expense of the Contractor by the SABS or such other body as may be approved by the Inspectorate.

No mechanical working or straining of pipes and specials shall be allowed after testing and inspection.

Visual Inspection

All finished pipes and specials shall be visually examined and shall be free of injurious defects as defined in API 5L Section 10.7.

Non-destructive Inspection

Ultrasonic Inspection

Pipes shall be made by an approved welding process and 100 percent of all longitudinal or spiral welds on straight pipes shall be checked with an approved ultrasonic method capable of continuous and uninterrupted inspection of the weld seam in accordance with API 5L Section 9.10 , 9.11 and 9.12 except that the equipment shall be checked with an applicable reference standard at least twice every working turn.

Radiographic Inspection

Longitudinal Weld Pipe

All electric fusion welded pipes, shall be inspected by radiological methods for a distance of 200 mm from each pipe end.

Spiral Weld Pipe

All electric fusion welded pipes shall be inspected by radiological methods for a distance of 100 mm from each end of each length of pipe and of the complete "H" at all scalp and welds including 150 mm of the spiral welds in both directions away from the intersection points with the scalp and welds.

Circumferential Butt Welds

100 percent of the length of circumferential butt welds shall be examined provided, when consistently acceptable results are obtained, the number of welds to be so tested may be reduced by mutual agreement between the Engineer, the Inspectorate and the Contractor.

Specials

100 percent of all manual or semi-automatic welds in specials shall be examined radiographically provided, when consistently acceptable results are obtained, the number of welds to be so tested may be reduced.

Where specials can not be hydrostatically tested, all welds shall be liquid penetrate tested as per ASME Section V.

Repairs

Straight Piping :

100 percent of the total length of all repairs shall be examined radiographically provided, that where repairs are made before ultrasonic inspection and such repairs pass ultrasonic inspection, no further radiographic inspection of same is required.

Pipes for Rail, Road and River Crossing 100 percent of the total length of all welds shall be examined radiographically.

Hydrostatic Testing

a) Each individual straight pipe shall be subjected to a hydrostatic test in accordance with the methods described in API 5L, Section 5. Test pressures shall be such as to produce tensile fiber stresses in the pipe wall of not less than 90% of the minimum specified yield strength of steel or shall be 9 MPa whichever is the lesser. Leaks or sweats shall be considered injurious defects.

b) Should it not be possible to hydrostatically test straight piping and/or specials the through liquid penetrate test as per ASME Section V shall be done on all welds over and above the non-destructive tests specified above. This shall only be applicable with the prior written approval of the Engineer.

Repair of Injurious Defects

Injurious defects found by non-destructive testing of welds, visual examination, hydrostatic testing or determined by any other means to exceed the limitations in API 5L, Section 10.7 shall be repaired in accordance with API 5L Section 10.8 and 10.9 but subject always to the requirements of this specification.

Destructive Testing

The following destructive tests shall be performed in accordance with SABS 719 clause 7.2 on the first pipe and thereafter on one pipe every 500 subsequent pipes.

Transverse Tensile Test

Root Bent Test (Electric Fusion Welds)

Flattening Test (Electric Resistance Welds)

Sampling for Destructive Tests

First Sample

A section long enough to provide all the test specimens and material shall be cut from the selected pipe.

Second Sample

If the test specimens and material from the first selected pipe fail to pass any of the tests, a section long enough to provide the appropriate specimens for the test failed by the first sample shall be cut from two further pipes.

Third Sample

If the test specimen from the second sample fails to pass the test(s) a similar section shall be cut from each of a further ten pipes.

Compliance

The piping shall be considered as complying with the specification if after testing of the first or the second or the third sample no defect is found.

FLANGES

Material – shall be steel plates to conform to the requirements of SABS 1123.

Dimensions – shall be in accordance with SABS 1123 unless otherwise specified in the Schedule of Quantities or on the drawings.

Type – all flanges shall be of the steel-plate for welding type and shall have flat joint faces unless otherwise specified in the Schedule or Quantities or on the drawings.

Finish – joint surfaces shall be in accordance with SABS 1123 clause 4.5.

All flanges shall be supplied complete with bolts, nuts and washers of a material to conform to the requirements of SABS 1123 where applicable, otherwise to the requirements of the Engineer.

Gaskets for flanges joint shall be of compressed asbestos fiber to BS 2815 Grade A and full faced, unless otherwise specified in the Project Specification, with a minimum thickness of 3 mm.

FLEXIBLE COUPLING

Flexible couplings shall be of the Viking Johnson or Klamflex type with center register except where specified to the contrary in the Schedule of Quantities or on the drawings. Couplings must be able to withstand hydrostatic test pressures of 1.5 times the specified design pressures and coupling flanges must be designed to withstand all stresses due to tightening of the bolts. Rubber rings shall generally comply with SABS 974 Class F. The internal face of the sleeve section of each coupling shall be grit blasted to SIS 055900 Grade Sa3 finish with an anchor pattern profile not exceeding 75 micrometers in depth as determined by micrometer gauge or portable microscope fitted with a calibrated focusing knob. Within four hours of grit blasting provided surfaces are kept dry and clean, one coat of an approved epoxy resin, Copon or similar shall be spray applied, followed by further coats to a dry film thickness of not less than 300 micrometers over the average profile peak. All other surfaces of coupling components shall be grit-blasted to the same minimum finish and shall receive one coat of an approved protective paint which shall be compatible with materials to be used for the exterior molding of the coupling in the field. Flexible couplings shall be supplied complete with all necessary bolts, nuts and rubber jointing rings.

MARKING OF PIPES

All pipes and specials shall be clearly hand stamped alongside a longitudinal or spiral weld on one end of the pipe with the following.

Grade and thickness of steel

Serial number of the pipe or specials

Nominal diameter

Hydraulic tests pressure

ANCILLARY EQUIPMENT

Details of spares and special tools are to be listed in the Data Sheet.

The Mechanical Contractor will be responsible for the supply, delivery to site and erection of all ancillary equipment, in the form of holding down bolts, rawl-bolts, pipe clips, small pipes, grease piping etc. to complete the Mechanical Contract.

The Mechanical Contractor will also be responsible to compile a manual in which all the relevant mechanical equipment is described together with the routine maintenance, lubrication schedules etc for proper running of the plant.

CORROSION PROTECTION

SCOPE

This section includes the corrosion protection and materials required for this Contract.

GENERAL

The Contractor shall ensure that he has available the latest edition of all the relevant National Specifications and Codes of Practice and the manufacturer's data sheets for materials to be used.

All paints in a paint system shall be purchased from the same manufacturer.

The Contractor shall submit in the Appendices to the document, details of the paints he intends using and shall only proceed with purchase of the paints upon receipt of written approval from the Engineer. Manufacturer's data sheet or legible copies thereof for each product shall be attached to the Appendices.

Materials and procedures shall comply with the appropriate SABS Specifications and Codes of Practice when relevant.

Strict attention shall be paid to fettling of surfaces by the Fabricator (see Clause PZA 4) prior to coating. Surface preparation requirements, the need for strict cleanliness and adherence to specification requirements especially with regards to over coating times are emphasized.

Areas which are inaccessible after assembly shall be prepared and fully coated with the specified system and to the specified requirements before assembly. The coating shall be fully hard dry before assembly.

Mating surfaces shall be coated with primer of first coat only. The coating shall be uniform in thickness and shall not interfere with the mechanical tolerances. After assembly the outside surface of the joint shall be fully coated.

The painting sub-contractor shall provide evidence of his competence to apply the specified materials in the specified manner and to apply the necessary Quality Control procedures. The Engineer, at his discretion, may demand a Quality Audit of the Contractor's facilities by a technically competent and independent organization (See Clause PZA 10).

The Contractor shall provide a Quality Plan to show the stages at which Quality Control will be carried out. Further details are given in Clause PZA 10. The Quality Plan is subjected to approval by the Engineer, who may require it to be revised if considered inadequate.

The Engineer will require a Program of Work so that Quality Surveillance inspection can be planned and executed at the appropriate time according to the Contractor's program (see Clause PZA 10).

The Contractor shall provide to material suppliers descriptions of materials to be used and shall receive from them a written assurance that the materials to be supplied with the requirements specified.

DESIGN

General

All items shall be designed to minimize corrosion in exposed environments, under immersion conditions and in interior corrosive situations such as in chlorination rooms. The following notes may be used as guidelines.

Water Retention Areas

Avoid water retention areas wherever possible. For example, angle or U section steel should be used with the toes pointing downwards. The concrete base of steel columns should be sloped away from the steel and the sloping edge should be painted to avoid water ingress at the steel/concrete interface.

Crevices

Crevices give rise to accelerated corrosion by forming an oxygen concentration cell. Crevices may be avoided by using; continuous welding, not space welding mastics or sealants to seal unavoidable crevices such as bolted connections insertion rubber or suitable plastic between mating surfaces (See also Clause PZA 2.7).

Bimetallic Couples

Electrical contact between dissimilar metals gives rise to a corrosion cell when an electrolyte such as water is present. Junctions between dissimilar metals shall be insulated.

Accessibility

Whenever possible, the surface of corrodible materials such as mild steel shall be accessible for maintenance. The use of back to back angles, partially open box sections or inaccessible stiffeners shall be avoided.

Differential Aeration

Posts buried in soil are subjected to accelerated corrosion to differential aeration. Additional protection shall be given to that part which is buried and up to at least 100 mm above ground.

Sharp Edges, Weld Spatter and Weld Slag

The designer shall specify that all sharp edges be ground to a radius not less than 2 mm and that all weld spatter and weld slag shall be removed by the Fabricator (see Clause PZA 5).

Hot Dip Galvanizing

The design of articles to be galvanized shall be referred to the galvanizer (see Clause PZA 8).

COATING MATERIALS

No variation in materials tendered and approved by the Engineer shall be permitted without the approval of the Engineer in writing.

Correct material selection shall be confirmed by the material supplier (see Clause PZA 12.1).

All coating materials shall be delivered in the manufacturer's original sealed containers, clearly marked with the following:

Manufacturer's name.

Product Brand and Reference Number.

Batch Number which may incorporate the date of manufacture.

Date of manufacture, unless already incorporated in the batch number.

Abbreviated instructions for storage and use of the material, which shall include mixing ratios of components of multi-component materials, minimum temperature of application and method of application.

The SABS mark where applicable.

All coating materials shall be kept in an approved store, which shall be dry, enclosed and where the temperature is unlikely to exceed 40C or drop below 0 C.

Usage of materials shall be on a first in, first out basis and no materials may be used which have exceeded the shelf life recommended by the manufacturer.

FETTLING OR DRESSING BY THE FAVRICATOR

Before any surface preparation or painting is commenced, dressing shall be carried out to avoid projections, sharp edges, weld slag and spatter that will interfere with the corrosion protection. This includes the following:

Remove all weld flux and weld spatter. Flux is best removed by washing with clean water whilst weld spatter is normally removed by grinding to a smooth surface.

Sharp edges shall be ground to a radius not less than 2 mm.

Welds shall be continuous and shall have a smooth contour. Rough welds shall be ground where necessary to achieve the required smooth profile. Discontinuous welds shall not be permitted except by written approval of the Engineer. Undercuts are not permitted and shall be re-welded and ground where necessary.

Articles for hot dip galvanizing shall not contain overlap joints. Closed sections shall be suitably vented. See Clause PZA 8 (Hot dipped Galvanizing).

SURFACE PREPARATION FOR PAINTING

Mild Steel

Oil and grease contamination, when present, shall be removed by degreasing before blast cleaning.

Mild steel shall be blast cleaned in accordance with Section 4.3 of SABS 064 Code of Practice for "The preparation of steel surfaces for coating".

An additional requirement is that water soluble salts present in the steel after blast cleaning shall not exceed the value given in Table 1. Should these values be exceeded, the steel shall be cleaned by washing with clean potable water or by water shrouded or water injected blast cleaning until the soluble salts are within the limits specified in Table 1. The steel shall then be allowed to dry, after which it shall be flash blast cleaned to achieve the required degree of cleanliness.

Cast Iron and Cast Alloys

All cast surfaces shall be blast cleaned with new iron slag, copper slag, or platinum slag abrasives designed for blast cleaning. The abrasive shall not be recycled or re-used. Cast iron shall be blast cleaned until all sand particles, residual burst on sand and casting skin have been completely removed. This blast cleaning shall be carried out by the Foundry prior to dispatch to the galvanizer or painting contractor, when relevant. Conventional cleaning of castings is inadequate for galvanizing.

Galvanized Steel Surfaces

Galvanized steel surfaces shall be thoroughly degreased prior to painting, using either a water soluble solvent degreaser used in accordance with the manufacturer's instructions, or a mild acid-detergent degreasing solution. In both cases care shall be taken to avoid entrapment of cleaning agent in recesses or other retention areas and in both cases the surfaces shall be thoroughly washed until a "water break free" surface is achieved. If necessary, the process shall be repeated until a "water break free" surface is obtained.

A water break free surface is one which, when wetted all over with potable water, maintains a continuously wet surface and the water does not break up into islands of un-wetted surface.

TABLE 1 – STANDARDS FOR BLAST CLEANING REQUIRED

Property	Above Water	Immersed Surface	Tape Wrapping
Cleanliness to SIS 06 5900 (min)	Sa2½	Sa3	Sa2
Residual dust and debris	0,5%	0,3%	1%
Oil grease and perspiration	Nil	Nil	Nil
Surface Profile min (micrometers)	25 50	50 10	50 100
Water soluble iron salts maximum at any point	500 mg/m ²	100 mg/m ²	500 mg/m ²
Average of any 250 cm	100 mg/m ²	100 mg/m ²	100 mg/m ²

After degreasing, the surface shall be lightly abraded by one of the following methods:

On small areas by the use of abrasive paper not coarser than 120 grade, or by using non-metallic abrasive pads.

On large areas by “sweep blast cleaning”, using a nozzle pressure not greater than 300 kPa and a very fine abrasive. Cracking, flaking, or any form of delamination of the zinc coating due to excessive blast cleaning shall not be permitted. Removal of zinc by blast cleaning shall not exceed 10 micrometers.

Finally, all dust and debris shall be removed by vacuum cleaning, or by washing, and the surface shall be allowed to dry before coating.

Aluminium

Generally, aluminum surfaces will be anodized, or powder coated and will require no further treatment. Where painting is required, the aluminum surface shall be thoroughly degreased, then rinsed with clean potable water. If the surface is not “water break free”, repeat the degreasing process until a water break free surface is obtained. Allow to dry completely, then apply a thin coat (8 to 13 micrometers dry film thickness) of wash primer complying with SABS 723, mixed and applied in accordance with the manufacturer’s instructions.

NOTE: Wash primer is an adhesion promoter and does not replace the primer specified in the paint system.

Stainless Steel

Components fabricated from stainless steel shall not be contaminated with iron or mild steel. Sheared edges, welds or surfaces subjected to any form of heat treatment shall be picked and passivated. Stainless steel surfaces shall not be scratched or stressed.

When it is required to paint stainless steel, the surface shall be blast cleaned with non-metallic abrasive such as iron slag, copper slag or platinum slag. The use of steel shot, steel grit or cast iron is strictly prohibited. Any contamination with iron or mild steel is prohibited.

Where blasting is impractical, the surface shall be cleaned with detergent solution and roughened manually by using non metallic abrasive pads, followed by washing with clean potable water to a "water break free" surface. If a "water break free" surface is not obtained, detergent cleaning shall be repeated until the surface is "water break free". Allow the surface to dry before coating.

Painted Surfaces

Fully painted surfaces to be repaired

Bare areas shall be cleaned with abrasive paper not coarser than 220 mesh to bright metal surface. The surrounding paint, which must be intact, shall be feathered for a distance of 20 mm beyond the damaged areas. Dust and debris shall be removed by the use of a clean rag dampened with water or clean solvent that will not attack the coating. The damaged area shall be allowed to dry, after which spot repair shall be carried out with all the coats previously applied and shall overlap the undamaged area by 20 mm.

The requirements of the spot repair shall be not less than that specified for the undamaged coating.

When additional coats are required over the whole surface, the whole surface shall be abraded to a uniform matt finish, dust and debris removed, and the surface allowed to dry. All further coats shall then be applied as specified to give a uniform finish. Note that abrasion of the coating is not required for vinyl systems.

Fully painted surfaces to be over coated

Where additional coats are required over the whole surface, the surface shall be degreased and abraded to a uniform matt finish. The surface shall be washed to remove all

contamination and then allowed to dry. Further coats shall then be applied as specified to give the required coating thickness and specified finish.

Primed surfaces

Shop applied primers shall be thoroughly sanded with fine abrasive paper to achieve a uniform matt surface, then scrubbed with a solution of suitable water-based detergent-degreaser using a bristle brush, followed by clean water rinses to remove all grease and water soluble matter. The surface shall be allowed to dry completely before application of the specified coating system over the whole surface.

Plastic Surface such as u-PVC and Polyester GRP

Sand the surface thoroughly with fine abrasive paper to achieve a uniform matt finish. Remove all debris, oil and grease by scrubbing with a solution of a suitable water-based detergent such as Shell Teepol Lensex. Allow to react for 15 to 30 minutes, then rinse off very thoroughly with clean potable water to remove all residues. Allow to dry completely before painting.

APPLICATION OF PAINTS

Environmental Conditions

Paint shall not be applied in dusty conditions, nor when the steel surface temperature is less than 3 C above dew point, or higher than the advised by the paint manufacturer, or when humidity is greater than 85%, nor when the ambient temperature is less than the minimum or greater than the maximum specified by the manufacturer of the coating material.

Mixing

All coating materials shall be very thoroughly mixed until completely homogeneous. In the case of two pack materials, each component containing pigments shall be thoroughly mixed. The two components shall then be mixed together in the proportions supplied by the manufacturer until the mixture is completely homogeneous. In the case of solvent based epoxy materials, it is recommended that the mixed material be allowed to stand for an induction period of 20 to 30 minutes before use.

For two pack materials, the use of part of the contents (Split packs) is strictly forbidden.

Method of Application

Application shall be by brush, roller, spray, airless spray or other suitable equipment as appropriate for the surface to be coated and in accordance with the recommendations of the manufacturer. Application equipment shall be maintained in clean conditions and in good working order. The use of equipment not maintained in good condition may lead to rejection of the coating.

NOTE: Zinc silicate primers shall be applied by conventional spray, using a continuously agitated pressure pot, unless otherwise recommended in writing by the manufacturer.

Over-Coating

Over-coating times shall be not less than the minimum nor greater than the maximum specified by the manufacturer relevant to the ambient temperature. Strict adherence to over-coating times is particularly important for coatings which are subsequently immersed.

The contractor shall be held responsible for blistering of paint coatings on immersion, when shown to be caused by solvent retention.

All costs shall be clean and free from dust, oil, moisture, perspiration before over-coating. Operators handling blast cleaned or partially painted surface shall wear clean gloves to avoid contamination of the surface.

Manufacturer's Instructions

Recommendations supplied by the manufacturer in the form of the latest edition of printed data sheets, or given in writing on the manufacturer's letterhead, shall be followed. Verbal information by the manufacturer's representative will not be accepted unless confirmed in writing by the company.

Handling

Coated components shall not be handled earlier than the hard dry time recommended by the manufacturer, relevant to the ambient temperature. Coated components shall be handled with broad band slings and suitable packing to minimize damage to the coating. All damage caused in handling, transportation and erection, shall be repaired to the satisfaction of the Engineer at no extra cost.

METAL COATING AND CORROSION RESISTANT METALS

HOT DIP GALVANIZING

Design and Fabrication

Components for hot dip galvanizing shall be designed and fabricated in accordance with the recommendations of SABS Code of Practice Project No. 341/50490 (not published at the time of preparation of his specification), except that the use of lead plugs is not permitted.

It is recommended that the manufacturer consults the galvanizer before design and fabrication to ensure that the fabrication will be suitable of galvanizing.

The main requirements are as follows:

Overlap joints shall be avoided wherever possible. If essential, such overlap joints shall be thoroughly degreased before assembly and shall be vented by drilling holes through one or both overlapping materials.

Closed sections shall be suitably vented. If the inside of a closed section is not to be galvanized, a snorkel vent tube of suitable length and bore shall be attached.

Gussets and internal baffles in tanks shall be cropped to allow free flow of zinc and air.

Joints shall be continuously welded, using balanced welding techniques to avoid stresses. Welds shall be free from cavities, undercutting, weld slag and spatter.

Symmetrical design shall be used whenever possible and the use of thin gauge steel adjacent to heavy sections shall be avoided.

Openings and flanges of manholes and bosses shall finish flush on the inside to ensure complete drainage.

Castings shall be designed to be of as uniform section as possible and shall be blast cleaned in accordance with Clause PZA 6.2 before dispatch to the galvanizer.

The Hot Dip Galvanizing Process

Hot dip galvanizing shall comply with SABS 763 for fabricated articles, SABS 934 for pre-galvanized sheet, or SABS 935 for wire.

Mating surface on fabricated or cast iron components shall be wiped or centrifuged on removal from the galvanizing bath to remove blobs, runs or excess metal that may impair the air/gas/water tightness of the joint.

Bolts, nuts and washers used for fixing shall be hot dip galvanized to SABS 763. Electroplated fasteners will not be accepted unless otherwise agreed by the Engineer in writing.

Repair of Galvanized Articles

Welding, flame cutting, or other heat processes shall not be carried out on galvanized articles unless permission is granted by the Engineer in writing.

If such permission is given, or if mechanical damage has occurred, repair shall be carried out as follows:

All scale, spatter and flux shall be removed by grinding and washing with clean water. Edges shall be ground to a radius not less than 2 mm.

The preferred repair process is to blast clean the bare steel and apply zinc by the thermal spray process in accordance with SABS 1391 Part 1, Grade Zn 150. On completion of metal spraying, burnish the surface by means of a mechanical wire brush to give a uniform appearance. Such burnishing shall remove not more than 10 micrometers of zinc.

Where small areas are to be repaired, clean the surface thoroughly with fine abrasive paper, remove all debris with a damp cloth and allow to dry. Apply an approved one pack epoxy ester based zinc rich primer containing not less than 90% by mass of zinc in the dry film. A sufficient number of coats (usually 3 or 4) shall be applied such that the repair coating thickness is not less than the average zinc thickness specified in SABS 763, 934 or 935, as appropriate. The repair shall extend not less than 5 mm beyond the damaged area.

On completion of the repair and when the zinc primer is completely dry, one coat of alkyd resin aluminium paint may be applied to obtain a uniform appearance.

NOTE: Repair of galvanized surfaces by application of aluminium paint alone IS NOT PERMITTED.

Storage of Galvanized Components

Galvanized components shall be stored to avoid the formation of “white rust” or other forms of storage staining.

Components shall be separated and supported on wooden battens to ensure adequate ventilation of all surfaces and in such a manner to avoid “ponding” by rainwater.

If storage staining does occur, remove the stains by scrubbing with detergent solution and bristle brush or nylon pad. The use of steel wool or other metallic abrasive is not permitted. Rinse thoroughly and allow to dry. If the residual zinc thickness complies with the requirements of the appropriate grade in the relevant specification, no further action is required unless instructed by the Engineer.

If the zinc thickness is below specification, the article shall be re-galvanized or repaired in accordance with Clause PZA 8.3 as instructed by the Engineer.

STAINLESS STEEL FABRICATIONS

Grade and Welding Techniques

The grade of stainless steel to be used shall be as specified in the appropriate section of the mechanical specification or drawing. Where welding is necessary, the appropriate “L” (low carbon content) shall be used. Plate shall be supplied as No 1 Finish in accordance with BS 1449 Part 4.

Welding procedures shall be only those recommended by the stainless steel manufacturer or by the South African Stainless Steel Development Association. Only welders coded to BS 4870 Part 1 or to ASME IX, 1983 shall be employed.

Welds shall be smooth and free from blowholes, undercuts, sharp projections and similar visual defects.

Fabrication of stainless steel components shall be carried out in clean work places where there is no contamination by mild steel. Grinding and polishing equipment shall be dedicated and shall not be contaminated with iron or mild steel.

Stainless steel shall be suitably handled to avoid scratching the surface.

Pickling and Passivation

Cut edges, welds and heat treated surfaces shall be pickled and passivated to remove all discoloration. Proprietary pickling and passivating pastes (as supplied by Duva Chemicals (Pty) Ltd., or other approved supplier) shall be used in accordance with the manufacturer's recommendations. Care shall be taken not to exceed the maximum contact time recommended.

The safety precautions given in PZA 10.2 shall be strictly observed.

After passivation, surfaces shall be very thoroughly washed with clean potable water to remove all traces of acid. The surface shall be allowed to dry, then polished where necessary, using polishing compounds recommended by the stainless steel manufacturer or the South African Stainless Steel Development Association. SAFETY PRECAUTIONS as specified in Clause PZA 10.1 (ii) shall be strictly observed.

CORROSION RESISTANT STEEL 3CR12

Welding Techniques

Welds shall be full penetration welds, using 309 austenitic electrodes or filler wire, or as recommended by the manufacturers (Middelburg Steel & Alloys (Pty) Ltd).

Welders shall be suitably coded for welding similar thickness of austenitic stainless steel, in accordance with BS 4870 Part 1 or ASME IX, 1983.

Welding procedures shall comply with the recommendations of the manufacturers of 3CR12 (Middelburg steel & Alloy (Pty) Ltd).

Welds shall be smooth and free from blow holes, undercuts, sharp projections and similar visual defects.

Pickling and Passivation

After completion of welding, both weld and heat affected zones shall be cleaned, pickled and passivated. Any heat scale on the steel shall be pickled and passivated.

The procedure shall be as follows:

Not to painted surfaces Grind or wire brush, using dedicated grinders or stainless steel wire brushes to achieve the required smooth profile or remove scale.

Pickle with a thixotropic paste containing 15-20% nitric acid and 1-2% hydrofluoric acid, with a contact time of 15 to 10 minutes.

Rinse thoroughly with clean water until the pH of the washings is the same as that of the wash water.

Repeat the above process, if necessary to remove all discoloration.

Passivate with 10% nitric acid solution, or a proprietary passivating paste, for a contact time of 10-15 minutes, keeping the surface wet during this period.

Rinse thoroughly with clean potable water until washings are the same pH as the wash water.

Operatives shall wear protective aprons, gloves and safety glasses during pickling and passivating operations.

Splashes on the skin shall be thoroughly washed with clean water immediately after contact. A weak solution of sodium bicarbonate shall be kept available for neutralization. Seek medical attention if in doubt.

Disposal of effluent shall be in accordance with the requirements of the local authority in whose area the work is being carried out. Generally, the effluent is stored in drums containing an excess of lime (calcium carbonate).

ALUMINIUM

Anodizing

Aluminium components where specified as anodized shall be natural anodized and sealed in accordance with SABS 999 Grade 25. The corrosion resistance of the coating shall be not less than 8 when tested in accordance with 3.6 of specification SABS 999. Anodising shall be carried out after completion of all welding.

Powder Coating

When specified by the Engineer, aluminium handrails may be coated with polyurethane powder. Such coating shall only be carried out by Contractors with the necessary plant, equipment and experience to pre-treat and powder coat aluminium effectively. The coating shall comply with BS6496, 1984.

Fixing

Whenever aluminium components, such as stop log frames, come into contact with concrete or grout, the surface of the aluminium in contact with concrete shall be coated with two coats of an approved epoxy tar composition.

QUALITY ASSURANCE REQUIREMENTS

Contractor Qualification

The Tenderer shall state in the Appendix to his document the name of the painting sub-contractor that he proposes to use to carry out the painting or coating. The Engineer may, at his discretion, require a Quality Audit of the painting sub-contractor to ensure that he has the management, facilities, skilled staff, and quality control facilities and staff to carry out quality control during application of coatings to ensure compliance with the specification.

The contractor shall accept full responsibility for the quality of his work and of materials used, irrespective of any quality surveillance that may be carried out by the Engineer or his representative.

The contractor shall obtain confirmation from the material supplier that materials to be used comply with the specification and are suitable for the intended purpose by having the appropriate Appendix completed by the material supplier.

Quality Control

The contractor shall have the necessary equipment and staff knowledgeable in test procedures to carry out all the quality control required to ensure compliance with the specification. The contractor will be required to produce a quality plan and a program for carrying out the work. The contractor shall maintain quality control records of all stages of the work, batch numbers of materials used, environmental conditions, all as required by the specification. Quality control shall be inclusive in the contractor's tender price.

Quality Surveillance

Independent surveillance – The Engineer may employ an independent technically of the work on his behalf.

Program – The Contractor shall advise the Engineer timeously, in writing, when and where the following processes will be carried out:

Completion of fettling or dressing prior to leaving the fabricator's works.

Blast cleaning and application of the first or prime coat.

After completion of all coats to be applied at the contractor's works.

At the commencement of repairs to be carried out on site.

Failure of the Contractor to advise the Engineer of his program may result in rejection of the work.

Access for Surveillance

For the purpose of carrying out quality surveillance, the Engineer or his representative shall be granted access to any part of the Contractor's premises relevant to the work being carried out, at any reasonable time. The Contractor shall provide, at his own cost, any equipment or labour necessary to gain access to surfaces which are coated, to be coated or are in the process of being coated.

Samples

The Engineer or his representative may remove any reasonable samples of materials to be used in the coating application. Rejection of the sample will place a hold on the use of material of the same batch number and may lead to rejection of all that batch of material and the reworking of any components that have already been coated with rejected material.

Destructive Testing

The Engineer or his representative may carry out reasonable destructive tests to ascertain compliance with the specification. Areas thus damaged shall be repaired by the contractor to the satisfaction of the Engineer at no additional cost.

Cost of Quality Surveillance

Cost of Quality Surveillance shall be borne by the Employer, except when surveillance results in rejection of the lot or when notice by the Contractor results in a fruitless strip, in which cases the cost shall be debited against the contractor's account.

Quality Control Records

Proper and adequate quality control records shall be maintained by the Contractor for all stages of the work. These records shall be available for inspection by the Engineer or his representative at the time of Quality Surveillance. Incomplete, inaccurate or inadequate records shall be regarded as non-compliance with the specification, and the cost of surveillance will be back charged to the contractor.

Data Sheets, Specifications, and Codes of Practice

The contractor shall have available the latest issues of manufacturer's data sheets materials to be used, National specifications and Codes of Practice relevant to the work to be carried out, as well as a copy of his specification, all of which shall be available to the Contractor's Quality Control Manager.

PART C4

SITE INFORMATION

C4 Site Information

C4.1 Scope of Site Information

C4.1.1 LOCATION OF THE WORKS

The pump station is located at the Sasolburg Town.

C4.1.2 DESCRIPTION OF THE SITE AND ACCESS

Contractor to organise access in consultation with the Municipality.

C4.1.1 GEOLOGICAL AND GEOTECHNICAL ASPECTS

Contractors must acquaint themselves of the conditions on site.

C4.1.2 EXISTING STRUCTURES

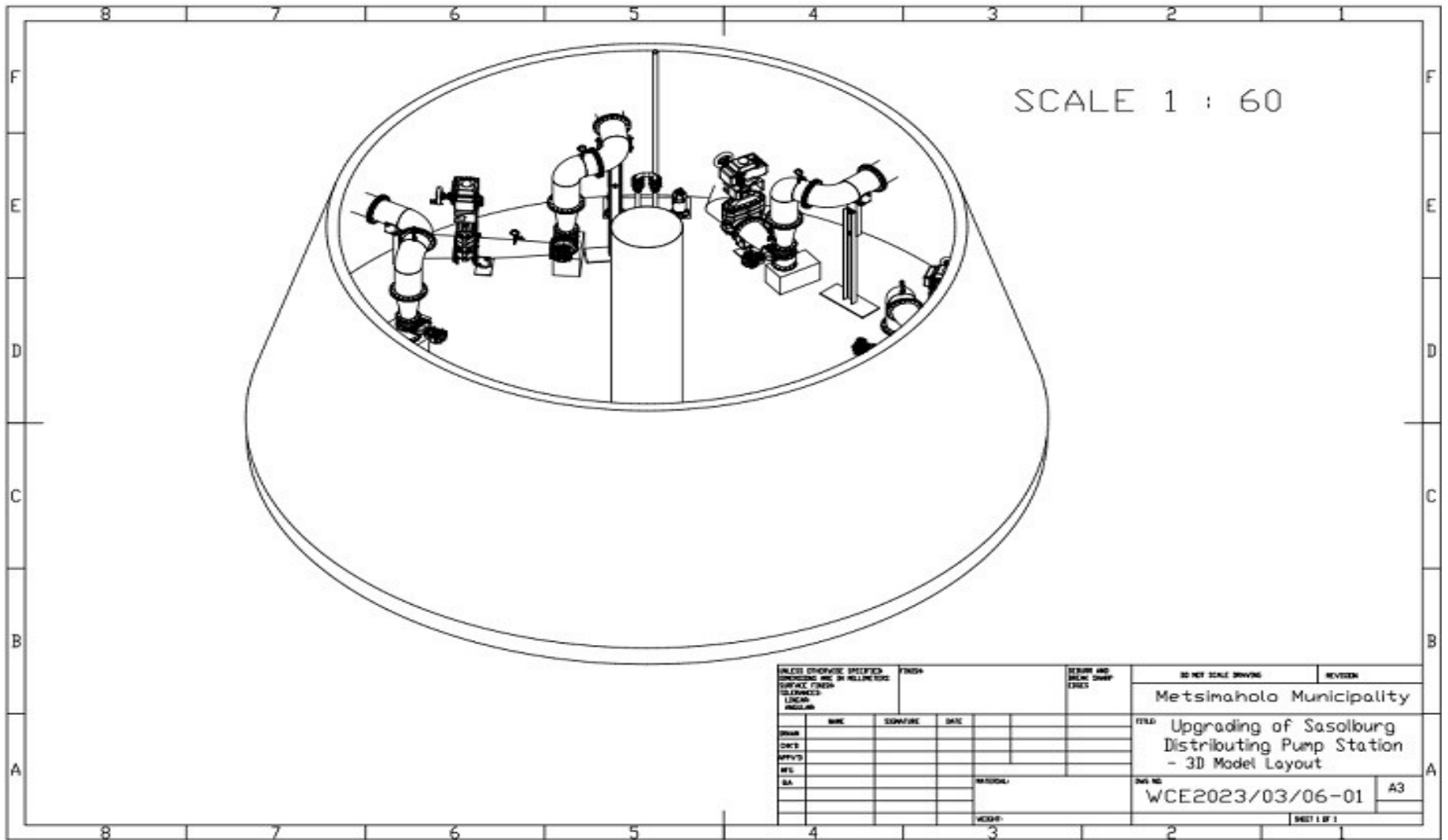
There is existing infrastructure present on the site.

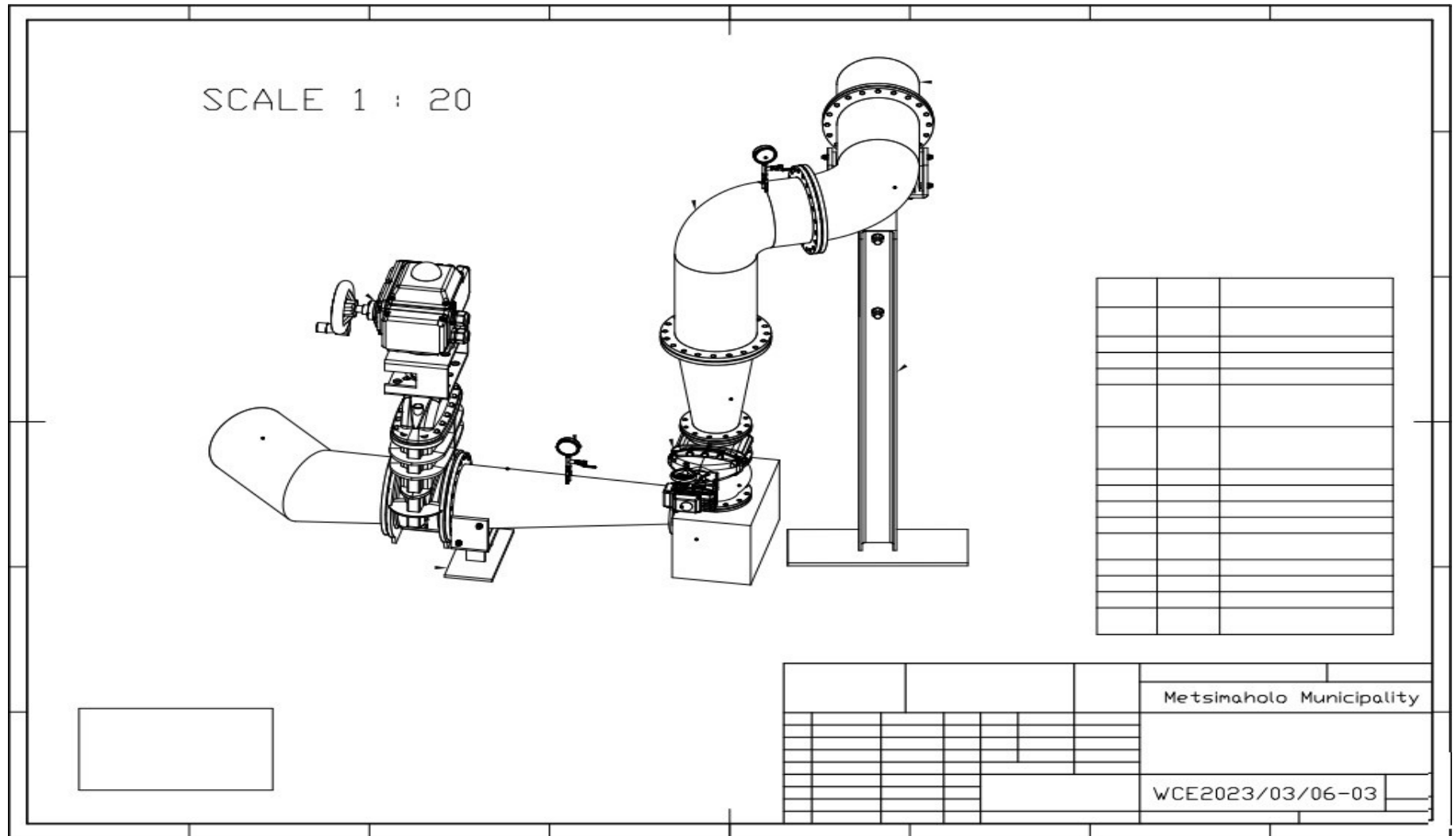
PART C5 ANNEXURES

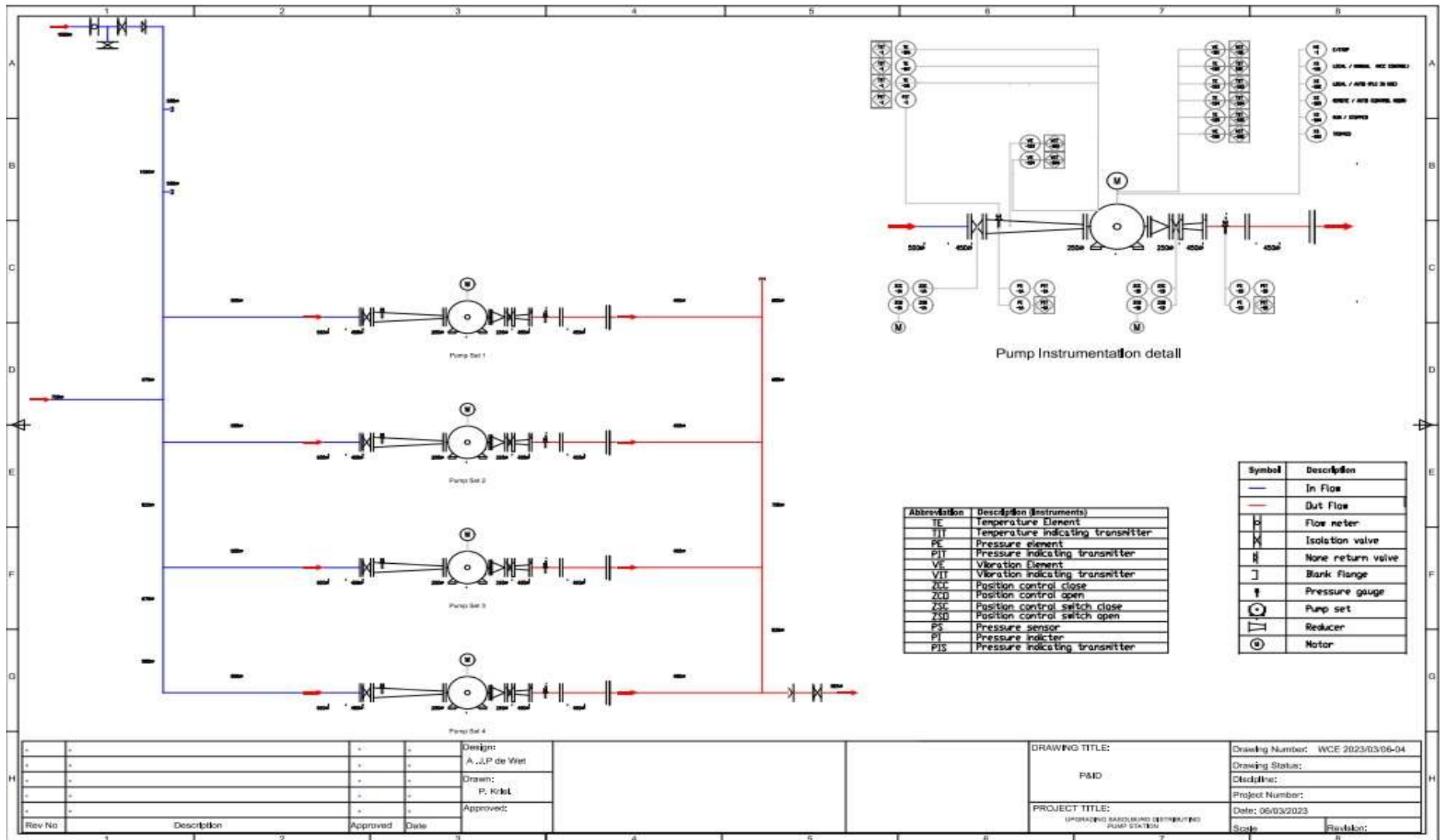
TENDER DRAWINGS

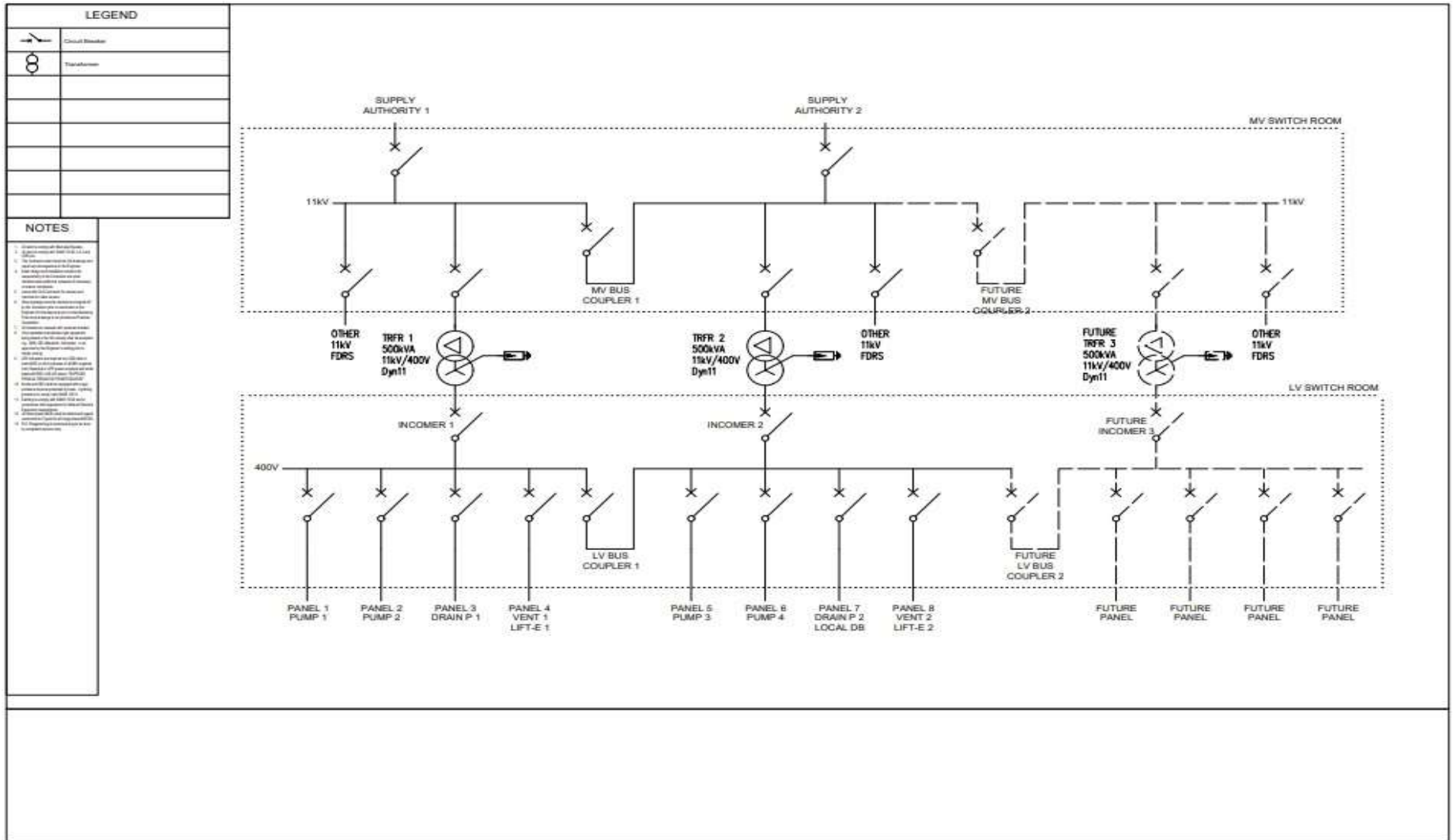
The work shall be carried out in accordance with the following drawings which form part of these contract documents:

**PLEASE NOTE: THIS DRAWINGS ARE
FOR TENDER PURPOSE ONLY**











No.	Date	By

Client:
METSIMAHOLO LOCAL MUNICIPALITY

Project:
UPGRADING OF MALLAMMOR WATER PUMP STATION

Drawing:
GUARD HOUSE

Date: FEBRUARY 2022 **Scale:** AS SHOWN

FOR THE ENGINEER'S USE ONLY:

APPROVED FOR THE PROJECT:
MUNICIPALITY ENGINEER
CHIEF SITE
ENGINEER
AS SHOWN
PLANNING
PLANNING
PLANNING

Designed By	PR
Drawn By	SM
Checked By	PR
Reviewed By	PR
Drawn By	PR
Drawn By	PR